INFERRING COGNITIVE LEARNING STYLES IN AN E-LEARNING ENVIRONMENT

By

Daniyal Mohammed Alghazzawi

B.S. (CS), King Abdulaziz University, Jeddah, Saudi Arabia, 1999
M.S. (EECS), University of Kansas, Lawrence, Kansas, USA, 2003
M.S. (T&L), University of Kansas, Lawrence, Kansas, USA, 2004

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Chairperson: Dr. John Gauch

Committee members:

Dr. Ronald Aust

Dr. Susan Gauch

Dr. James Miller

Dr. Gary Minden

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The Dissertation Committee for Daniyal Mohammed Alghazzawi certifies
that this is the approved version of the following dissertation:

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Committee:

Chairperson

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ABSTRACT

Computer-aided instruction has been playing a crucial role in supporting learning. Early computer-aided instruction delivered a single style of content to all learners without any consideration of their learning styles. Recently, systems have been developed to adapt content based on the learners' learning styles. These systems use instruments, such as questionnaires and interview, to infer the learning styles. Using such instruments costs learners extra time, and they have to be done explicitly. In addition, these systems do not adapt the learning styles of learners over time. These drawbacks are the problem addressed in this study.

The purpose of this research was to infer the learning styles of students while they are browsing online instruction. This indicates that the inferred process can be done implicitly, in less time, and repeated over time. The focus of this study was on the three cognitive learning styles: holist, serialist, and versatile. In order to achieve this goal, a classification system was developed, which contains three online lessons and uses two mechanisms (Tracking and Questions) to extract useful information about the users' behaviors. The extracted features were used by a collection of classifiers to infer the users' learning styles. These results were compared with those of the Study Preference Questionnaire by calculating the Pearson correlation between them. The major implication of this study is that the classification system developed for this study accurately infered the learning styles.

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1. INTRODUCTION

1.1 Motivation

Computer-aided instruction has been playing crucial role in supporting educators and learning since the 1960s. During this time, many teaching methods have been introduced in the traditional classes, and many studies have been conducted to test the performance of these new methods. Some of these methods have been used to develop computer-aided instruction to substitute the tradition instruction and to enhance the effectiveness of learning. More recently, computer-aided instruction was enhanced to be able to stand alone, and some universities started offering online classes that do not have an instructor. The development of computer-aided instruction over these years can be summarized in three major periods as shown in Figure 1.

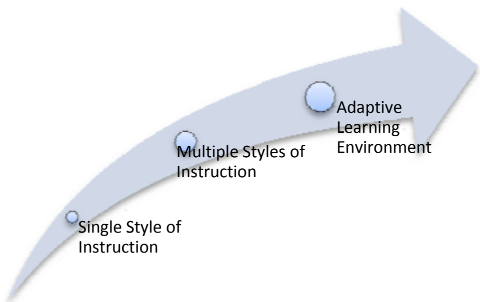


Figure 1.

The three major periods of development computer-aided instruction

At the earliest period, educators delivered content in single style only to students. At that time, educators used technology to develop computer-aided instruction where students were capable of browsing instruction sequentially in the same manner as traditional classes. In addition, computer-aided instruction provided new, unique ways of teaching efficiently. For example, online instruction can be used interactively (Maddux, 1996) and can be accessed asynchronously. These unique features provided by online instruction involve learners in the whole learning process (Chiou, 1995; Owston, 1997), which is difficult to accomplish in a traditional class.

During the second period, some educators delivered the same content in multiple styles to support different groups of learners. In traditional classes, educators started developing different styles of content and gave learners the opportunity to choose the style they liked. For example, there are many references, such as books and online websites, with different styles to help learners to solve mathematical equations. In online classes, learners were given the same opportunities to choose the reference with the style they liked. In addition to this, learners had the ability to customize their learning environment by choosing alternative graphical interfaces, different color schemes, and different font sizes to suit their preferences. This indicates that online classes can accommodate users' characteristics more than in traditional classes, where students do not have much control over the learning environment.

The most recent period has seen the emergence of Adaptive Learning Environments (ALE). A learning environment is considered adaptive if it is capable of "monitoring the activities of its users; interpreting these on the basis of domain-specific models; inferring user requirements and preferences out of the interpreted activities, appropriately representing these in associated models; and, finally, acting upon the available knowledge on its users and the subject matter at hand, to dynamically facilitate the learning process" (Paramythis & Loidl-Reisinger, 2004). Because some studies found that when learners matched their learning styles with the appropriate instructional style, they scored significantly higher than those who were mismatched (Bajraktarevic, Hall, & Fullick, 2003; Pask, 1976), educators started developing a group of questionnaires that are able to predict the learning styles of learners. After predicting the learning styles of learners, it is possible to provide them with content that matches their styles. In this way, educators can adapt content in the traditional classes.

Developers of online classes started using questionnaires to infer the learning styles of learners and to support: adaptive interaction, adaptive course delivery, content discovery and assembly, and adaptive collaboration support. The first category, adaptive interaction, refers to the interaction between a user and the system without modifying the content, such as providing alternative graphical interfaces, different color schemes, and different font sizes to suit user preferences. The second category, adaptive course delivery, focuses on learning content. An example of this category is to deliver alternative learning contents to fit user characteristics in order to achieve the desired goal in a short period of time. The third category, content discovery and assembly, refers to the applications that locate the suitable learning objects from repositories and assemble them. The fourth category, adaptive collaboration support, focuses on matching individuals to collaborate on work toward common goals. Again, this period indicates that online classes can accommodate users' characteristics more than traditional classes can.

However, conducting questionnaires to infer learning style is intrusive and time consuming. For this reason, this research has focused on mechanisms to infer the learning styles accurately, without using a questionnaire.

1.2 The Problem Addressed in the Study

Although some recent online instruction is capable of adapting content, they use an explicit instrument, such as questionnaire and interview, to infer the learning styles of the learners. Using this type of instruments has several drawbacks. A major drawback is the time cost of taking them and calculating the score results. Using an online version of an instrument has another drawback, which is that the absence of the expert while the instrument is taken may result in inaccurate responses. In addition, online instruction that use these instruments to adapt content are not able to adapt any new changes in the learning style of students over time because the students usually complete these instruments once at the beginning. This study focuses on solutions to these problems.

1.3 Purpose of the Study

The intent of this research was to develop ALE without the users explicitly completing an instrument. The purpose of this study was to develop mechanisms that can be used to infer the learning styles of users by observing their behaviors during a group of online lessons. The focal point of this research is on learners with one of the three cognitive learning styles: *holist*, *serialist*, or both (*versatile*). To do this, a system, called *Classification System*, was developed to substitute for the questionnaires. The Classification System contains three online lessons and uses two mechanisms (*Tracking Mechanism* and *Questions Mechanism*) to infer the cognitive learning styles of the users. Then, the Classification System was evaluated on a group of participants from the Computer Science Department at The University of Kansas.

1.4 The Classification System Architecture

The Classification System aims to infer the learning styles of learners implicitly. It consists of four components, as shown in Figure 2: (1) Learning Object Metadata (LOM) Repository, (2) The Content Pages, (3) Extracting Features, and (4) Pattern Recognition.

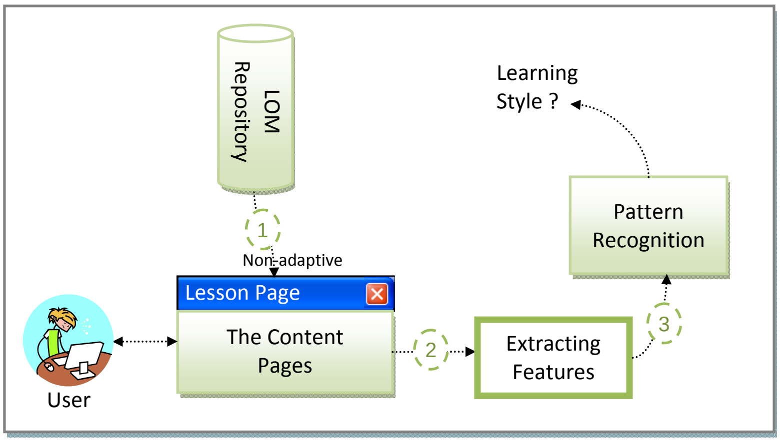


Figure 2.

The Classification System architecture.

The first component contains of a group of Learning Objects Metadata (LOM) called *LOM Repository*. A learning object is defined by the IEEE LOM Standard as "any entity–digital or non-digital–that may be used for learning, education or training" (IEEE, 2002). Discovering a group of learning objects from a repository and assembling them can build the contents of any subject matter. In this study, a group of learning objects that are able to build the contents of three lessons was developed.

The contents of the three lessons can be delivered to the second component, *The Content Pages*, in two ways: (a) Non-Adaptive Content and (b) Adaptive Content. *Non-Adaptive Content* means that the same style of content is delivered to all the learners without considering their learning styles. However, *Adaptive Content* refers to ALE where learners receive content that matches their styles. Because the Classification System is designed to only infer the learning style of learners, it delivers non-adaptive content to all the participants, and it sends the sequences of the participants' clicks on the lesson maps to the third component.

The third component, *Extracting Features*, processes the sequence of participants' clicks to identify small scale usage patterns, such as the number of times each type of learning object is viewed, and the order in which specific types of learning objects are viewed. The extracted features from each participant on each lesson are sent to the fourth component.

The fourth component, *Pattern Recognition*, is a branch of artificial intelligence that is defined as "the study of how machines can observe the environment, learn to distinguish patterns of interest from their background, and make sound and reasonable decisions about the categories of the patterns" (Jain, Duin, & Mao, 2000). Pattern recognition with *v-Fold* classification and validation technique is used to infer the learning style of each of the participants during each of the three lessons.

1.5 Research Plan

This study was conducted at The University of Kansas in three stages. The first stage focused on developing two components of the Classification System, which are LOM Repository and Content Pages, as shown in Figure 2. These two components were developed in two steps. In the first step, a database was built using MySQL for the LOM of three lessons taken from a Computer Science course offered by The University of Kansas during Fall 2006. Chapter 3 provides more detail about learning objects and learning objects metadata and also illustrates the lesson maps for the three online lessons written in learning objects' format. In the second step, the user interfaces for the three lessons were developed using PHP Language and Flash. The contents of the online lessons were built by assembling a group of learning objects from the repository. The content pages of all the three online lessons were almost the same; however, there were nine questions among the content of the third online lesson. These questions were used in the study to provide more information about the participants' preferred learning styles. Chapter 4 illustrates the user interfaces for all the three online lessons including more detail about the nine questions.

The second stage studied the interaction between the online instruction and the participants. The participants were 67 undergraduate students from The University of Kansas. Sixty-four of them finished the first online lesson, while sixty-five of them finished the second online lesson, and only sixty-three of them finished the third online lesson including the nine questions. The participants were asked to fill out an online version of the Study Preference Questionnaire at the beginning in order to validate the results of the Classification System. Then, they were asked to complete the three online lessons and to answer the nine questions during the third online lesson. Chapter 5 describes the research method including more detail about the participants.

The third stage focused on developing two components of the Classification System, which are Extracting Features and Pattern Recognition, as shown in Figure 2. These two components aim to assign each of the participants to one the three groups (Holist, Serialist, and Versatile). To do this, the Classification System extracted features from the interaction between the participants and the three online lessons by using two mechanisms. The first mechanism, the Tracking Mechanism, extracts features in two steps. The first step focuses on gathering the sequence of each participant's clicks on the learning objects within the lesson maps. This sequence is called *Tracking Patterns*. The second step is to extract 336 features from the repeated sequences in the Tracking Patterns for each lesson. The second mechanism, the Questions Mechanism, extracts nine features from the participants' answers for nine questions. These two mechanisms are able to extract 345 features from each participant at each lesson that reflect their behaviors. This full set of features is used to train and test 13 pattern recognition systems, called *classifiers*, using *v-Fold* technique in order to infer the learning style of each of the participants during each of the three lessons. In Chapter 5, these two mechanisms and the thirteen classifiers are described in more detail.

This study aimed to find a significant correlation between the Study Preference Questionnaire and at least one of the thirteen classifiers in at least one of the three online lessons. Chapter 6 shows the results of this study. In addition, this study investigated the most important features used to classify the participants, and that is described in Chapter 7.

1.6 Hypotheses and Research Questions

1.6.1 Hypotheses

1. There are correlations between classifying users based on their learning styles using the Classification System during the first online lesson and classifying users based on their learning styles using the Study Preference Questionnaire.
2. There are correlations between classifying users based on their learning styles using the Classification System during the second online lesson and classifying users based on their learning styles using the Study Preference Questionnaire.
3. There are correlations between classifying users based on their learning styles using the Classification System during the third online lesson and classifying users based on their learning styles using the Study Preference Questionnaire.

1.6.2 Research Questions

1. Does tracking the sequences of visited learning objects on each lesson map provide helpful information to infer learning styles?
2. Does asking users questions about their preference in learning styles provide helpful information to infer learning styles?
3. How many lessons does the Classification System need to examine in order to infer learning styles?
4. Which features that can be extracted from users' behaviors help to classify their learning styles?
5. Which classification models provide significant correlation between the Study Preference Questionnaire and the features extracted from each online lesson?

1.7 Dissertation Outline

The remainder of this proposal is organized as follows. Selected research learning theories and artificial intelligence are reviewed in Chapter 2 in order to lay the groundwork for the development of the Classification System. In Chapter 3, IEEE Learning Object Metadata Standard and the proposed extension used to achieve the goal of this research are described. The design of the user interfaces and the database for the Classification System are illustrated in Chapter 4. The method, including detail about the two mechanisms used to extract features, is described in Chapter 5. In Chapter 6, the results of using groups of classifiers are reported. Finally, Chapter 7 analyzes the results in discussion that includes the limitation and the recommendation of this study.

<u>2. REVIEW OF THE LITERATURE</u>

This chapter reviews selected literature in the areas of learning, online instruction, and pattern recognition. The key concepts of this prior research were used to lay the groundwork for the development of the Classification System used in this study.

Online instruction is an effective approach to improve learning, as shown in Section 2.1. Section 2.2 reviews the four basic learning schools of thoughts that categorize learning theories. These are *Behaviorism*, *Cognitivism*, *Constructivism*, and *Humanism*. The focal point of this research is on learners with one of the three cognitive learning styles: *holist*, *serialist*, or both (*versatile*). Prior research about traditional classes that can be applied to online instruction is reviewed in Section 2.3, while the discussion turns to prior research on online classes in Section 2.4. Four examples of tracking and adaptive systems are described in Section 2.5. Section 2.6 briefly describes the Artificial Intelligence area, including common architectures of expert systems. Section 2.7 reviews a branch of artificial intelligence, Pattern Recognition, including four common classifiers models. Finally, the chapter concludes by discussing the purpose of reviewing each of these topics as they apply to the purpose of this research.

2.1 The Importance of Online Instruction

The Internet provides new ways of teaching efficiently. Online instruction can be used interactively, a unique characteristic of the Web (Maddux, 1996), so students can be involved in the whole learning process (Chiou, 1995; Owston, 1997). Amruth (2005) proved that students who use an online tutor for practice learn better than those who use a printed workbook. Also, adopting the World Wide Web (WWW) as a resource in classrooms enhances teaching and learning (McCarthy, Grabowski, & Koszalka, 1998). As Hutchings et al (1992) points out, computer-aided learning provides three important dimensions of development: learners adapt their instructional paths, learners can engage the material actively rather than passively, and learners synthesize new materials by creating relationships rather than merely observing existing ones. Another advantage of using online instruction is to reduce the time spent asking instructors for additional help (Elizabeth & Joseph, 2001), especially if online instruction supports an automated question answering feature (Voorhees, 2001).

A unique feature in online instruction is asynchronous access. This type of access is used by the majority of the institutions that offer distance learning courses (Waits & Lewis, 2003). An example of asynchronous access is OpenCourseWare system by the Massachusetts Institute of Technology (MIT) at Cambridge. Besides the asynchronous access, such as, watching a live lecture or chatting with group members. An example of this type of access is the Network EducationWare (NEW) system (Snow, Pullen, & McAndrews, 2005).

2.2 An Overview of Learning Theories

Learning theories are critical to the development of effective online materials and tools that are incorporated to make instruction more efficient for teaching and more effective for students. Learning theories are categorized by four basic learning schools of thought: cognitivism, behaviorism, constructivism, and humanism/contextualism. These schools of thought overlap, but the main difference among them is the locus of learning processing, i.e. whether it is more instructor- or learner centered. Instruction needs to shift from instructor-centered to learner-centered to engage learners actively rather than passively (Hadjerrouit, 2005). Behaviorism and cognitivism methods are more instructor-centered (instructors tell students what to do), while constructivism and humanism methods are more learner-centered (learners take responsibility for their own learning) (Man, 2004). The following four sections give brief descriptions on each of these schools of thought. Then the last section concludes by discussion the main differences among them.

2.2.1 Behaviorism

Behaviorism, the oldest learning school of thought, is based on behavioral psychology. Behaviorists look at the human brain as a "black box," as shown in Figure 3, not focusing on how the brain processes information. They use instructional materials with sequences of corrective feedback to achieve learning.

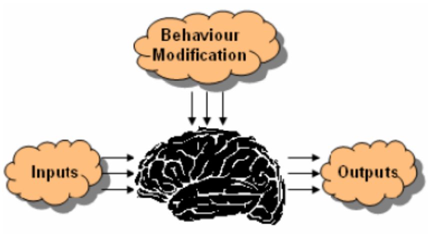


Figure 3.

The brain as a "Black Box" (Man, 2004)

Ivan Pavlov (1927) found that animals' behaviors change under conditions (stimulus) when they are rewarded, as shown in Figure 4. Later, Skinner (1953) discovered that humans learn in response to a stimulus if there are sequences of corrective feedback. Behaviorists believe that both rote learning and online drills and practice enhance learning. For optimal learning results, instructors need to post lecture notes online and focus on repetition. Also, they need to post online activities that provide feedback until the learners find the right answer.

(Stimulus) Instructional materials	*(Reinforcement)* Corrective feedback / Reward	*(Behavioral changes)* Learner outcomes

Figure 4.

The behaviorism processing

2.2.2 Cognitivism

Cognitive psychology developed in the late 1950s to focus on brain processing during learning. Cognitive theory enhances learning by reducing the demand on the working memory (Huitt, 2003). An important assertion in this theory is that learners construct their own understanding of subject matter; they are not just receptacles. Learners actively process information by organizing, storing and then finding relationships between information, linking new to old knowledge, schema, and scripts (D.Bransford, L.Brown, & R.Cocking, 2000) as shown in Figure 5. Therefore, online instruction can help students enhance their own learning systems if it provides students with the procedures that they need for processing information actively (Pask & Scott, 1972). Then, the students can apply these procedures to different subject matter, which is called *transfer learning*.

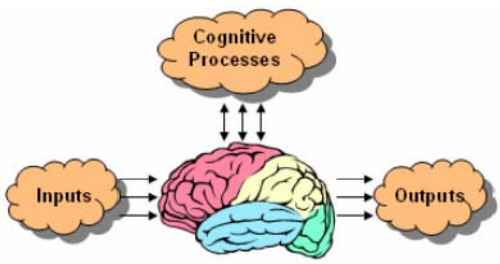


Figure 5.

The thinking brain (Man, 2004)

They are ten cognitive learning styles that describe how learners interact with their environments (Jonassen & Grabowski, 1993). Each of the ten cognitive styles has an objective different from the others, as shown in Table 1, and each of them has different characteristics, as shown in Figure 6. The majority of online instruction does not cover all these cognitive learning styles because the lack of knowledge and the overhead work.

Table 1.

The Cognitive Learning Styles

Cognitive Style		Objective
Information Gathering	visual/ Haptic	indicates individual preferences for visual versus tactile information processing (Cherry, 1981).
	visualizer/ verbalizer	indicates individual preferences for attending to and processing visual versus verbal information (Kirby, Moore, & Shofield, 1988).
	leveling/ sharpening	indicates how individuals perceive and memorize images. Sharpening individuals tend to discover the small differences between images (Holzman & Gardner, 1960)
Information Organizing	serialist/holist	indicates the strategy that individuals use to represent information (Pask, 1976; Pask & Scott, 1972).
	analytical/ relational	indicates the strategy that individuals use to sort and form concepts (Ausburn & Ausburn, 1978).

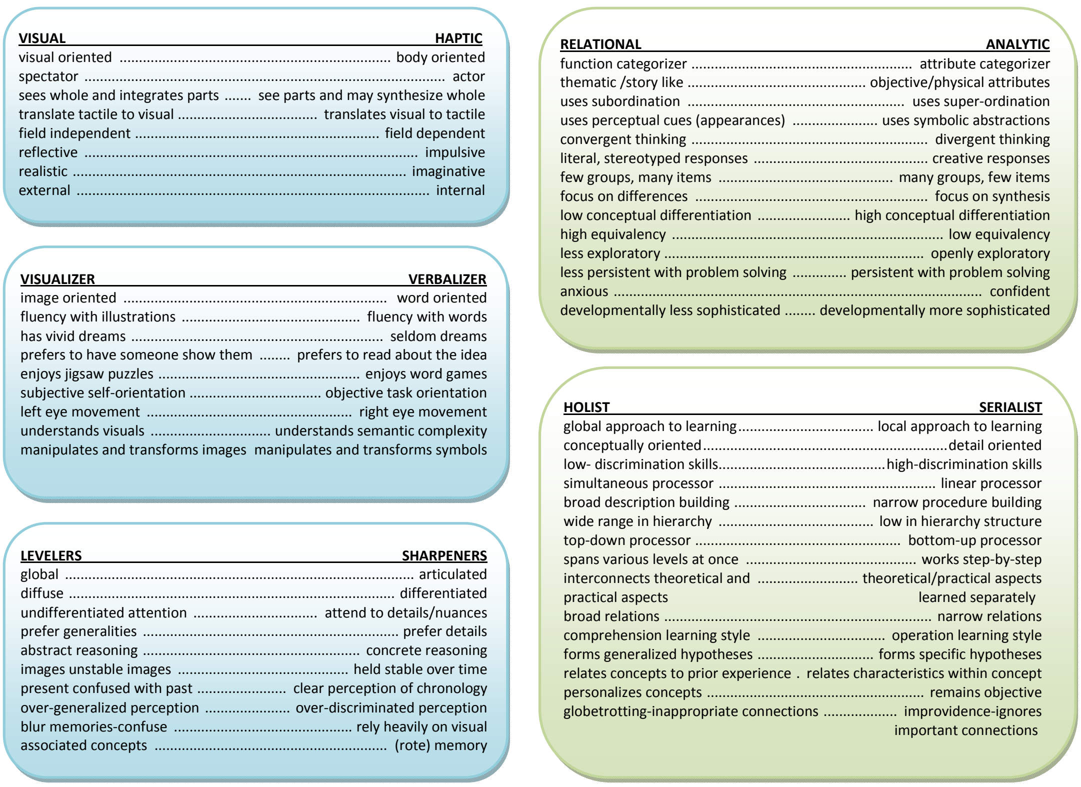


Figure 6.

The cognitive learning styles in detail (Jonassen & Grabowski, 1993)

Coverdale and Zaveri (2003) classify cognitive learners into two groups: *field dependent* and *field independent*. As shown in Table 2, field dependent includes Haptic, Visualizer, Leveling, Holist, and Relational learning styles, while filed independent includes Visual, Verbalizer, Sharpening, Serialist, and Analytical. Coverdale and Zaveri (2003) state the following:

> field independence is characterized by an individual's ability to perceive items as separate from the background. Field independent students tend to view parts of the whole, excel in analytic tasks, are more receptive to material that is inanimate and impersonal, and tend to be self-directed. Also, field independent students prefer to work independently and are object and task oriented. Field independent students are more able to select the important information from its surroundings and are not affected by external cues. Since field independent students reorganize and restructure small parts of the 'big picture' to create their own meanings and understanding of the presented information, field independent learning can be seen as inductive in nature. (p. 424)

Table 2.

Classifying Cognitive Learners into Two Groups: Field Dependent and Field Independent

Cognitive Learning Styles	Cognitive Controls	
	Field Dependent	Field Independent
Visual / Haptic	Haptic	Visual
Visualizer / Verbalizer	Visualizer	Verbalizer
Leveling / Sharpening	Leveling	Sharpening
Serialist / Holist	Holist	Serialist
Analytical / Relational	Relational	Analytical

Chinien and Boutin (1993) define the cognitive style field dependence/independence (FDI) as "a measure of a learner's perceptual and processing characteristics which influence the preferences and strategies learners use to perceive, process, store, and recall information”. Then, they describe the correlation between each of these two fields and three types of the memory (sensory, working, and long-term memories) as shown in Figure 7.

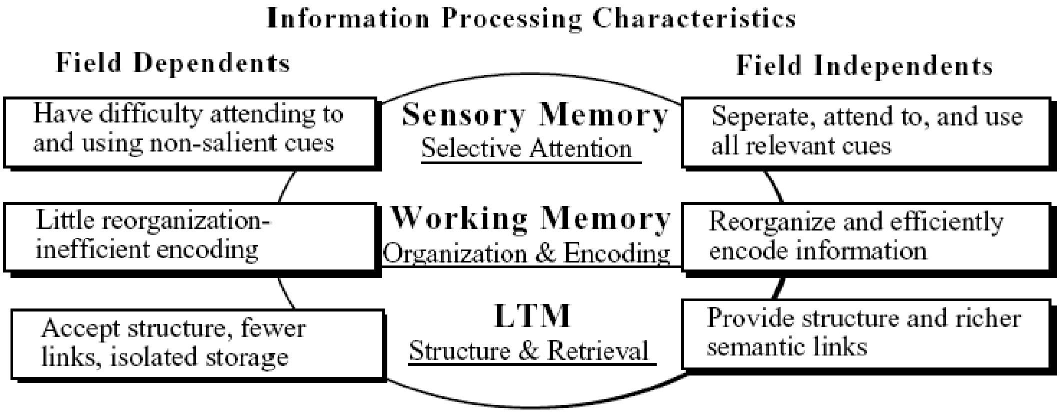


Figure 7.

Information processing characteristics (Chinien & Boutin, 1993)

2.2.3 Constructivism

Constructivists build new knowledge through an interaction with the environment rather than merely through instructors (Dewey, 1938, 1991), as shown in Figure 8. Therefore, each learner constructs different knowledge depending on his/her existing knowledge, which may result in fallible knowledge (Simon, Robert, & Mark, 1997). The role of instructors is to lead learners to the correct theory using the learners' existing knowledge, so instructors help learners to become problem-solvers. Instructors may need to build a viable model that represents an instruction so learners can predict (construct knowledge) the outcomes (instruction) of this model. For example, visual icons in computers are an example of such a model; an icon helps users to predict the outcome. Ben-Ari (1998) concluded in his survey paper that having learners construct alternative frameworks (depending on their own knowledge) may not work with some subject matter that needs to be memorized, such as syntax or semantics of a programming language.

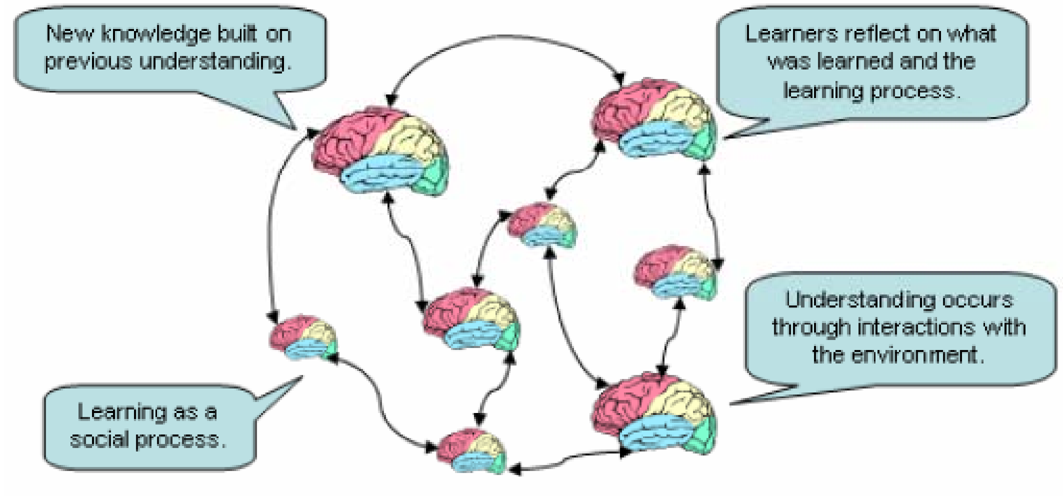


Figure 8.

The constructive brain (Man, 2004)

Constructivism can be applied to online assignments. In this case, instructors need to give a brief background on the solutions during the lessons. Later, learners need to use the instructors' hints and their own knowledge to solve the assignment.

2.2.4 Humanism / Contextualism

Humanism is a belief that human beings are able to make decisions and influence others with these decisions, so humans have responsibilities to self and society, as shown in Figure 9. Humanism focuses on an instructor's ability to foster a learner's self-concept to be self-directed. Learners in humanism construct knowledge similarly to those in constructivism (Leonard, 2002). There is not much research about humanism because most researchers believe that humanism is a part of constructivism. However, some researchers believe that humanism is a recently developing school of thought.

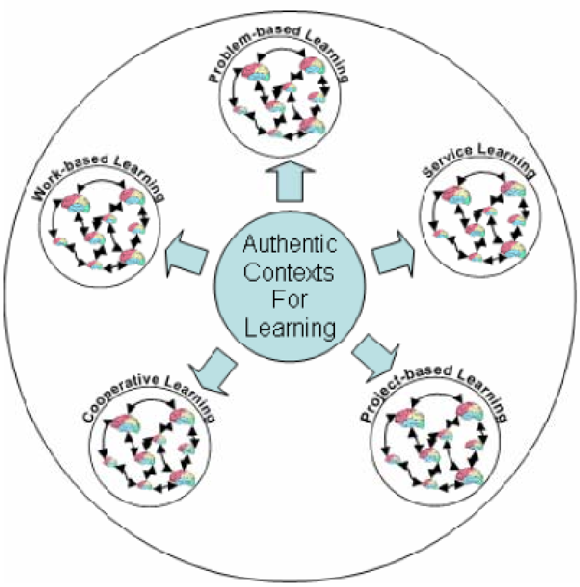


Figure 9.

The contextual brain (Man, 2004)

Humanism can be applied to online assignments. In this case, instructors do not need to give any brief background on the solutions during the lessons, while learners need to explore external materials, such as references, and use their own knowledge to solve these assignments.

2.2.5 Conclusion

Each learning school of thought has a different role for the instructor and for the learner and its ways to achieve learning. Behaviorism is instructor-centered, as is Cognitivism. Nevertheless, Behaviorism is concerned with changing the behavior of learners by response to stimuli provided by instructors (instructor-centered). In contrast, cognitivism is concerned with transmission of knowledge from instructors to learners, and this knowledge is processed in the learner's brain. Cognitive learning can be achieved by instructors assisting learners to relate the new knowledge to prior knowledge (instructor-centered). In other words, instructors have full responsibility for the learning process in behaviorism and less responsibility in cognitivism. Learners have no responsibility of the learning process in behaviorism and somewhat more responsibility in cognitivism.

Constructivism is learner-centered, as is humanism, as shown in Figure 10. Nonetheless, constructivism believes learners need to be self-motivated (learner-centered), so learners need to construct new knowledge using their own experiences. This experience can be achieved by hand-on activities or by interacting with the environment. While Humanism has focues similar to constructivism, constructivism is concerned with the effect of the constructive knowledge in the learners, while humanism is concerned with the constructors' (learners') growth (through the learning process). In conclusion, learners have full responsibility for learning processing in constructivism and humanism. Humanism believes that learners have a strong ability to make decisions that influence others.

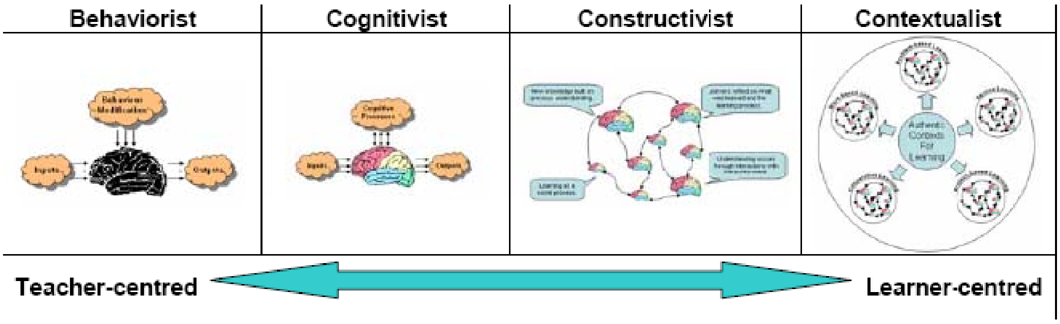


Figure 10.

The schools of thought (Man, 2004)

2.3 Cognitive Learning Theories in Traditional Classes

A study has been conducted by Svinicki (1991) about three practical implications of cognitive theories that can be applied in online instruction. The first implication of cognitive theories is that instructors can help students understand and memorize information by providing examples, images, elaborations, and connections to prior knowledge. Amruth (2005) confirmed that learners who receive both graphic visualization and text explanation learn better than those who receive only graphic visualization or only text. Using these extra instructional materials that help learners understand and memorize information faster and more effectively is called *accelerated learning*.

Accelerated learning seeks to include all parts of the brain to achieve faster and more effective learning. The left and right hemispheres of the brain process different types of information. The left hemisphere, *the academic hemisphere*, processes in a linear, sequential, verbal, and logical manner. The left brain has no trouble processing symbols (letters, words, and mathematical notations). On the other hand, the right hemisphere, *the creative hemisphere*, processes in a holistic, random, and intuitive manner in which people know the right answer, but they are not sure how they got it. Right-brain people like to see formulas more than symbols. Also, they know what they want to say, but they often have trouble finding the right words (Rose, 1985).

Colin Rose (1987) defined three learning styles: *visual*, *auditory*, and *tactile*. These styles activate the creative hemisphere of the brain in order to accelerate learning. He provides ways to help learners define their own learning style. So, when a student is reading and likes descriptive scenes or imagining the textual material, this means the student prefers the visual style of learning. On the other hand, if a student enjoys reading a dialog conversation or hearing the characters talk, this means the student responds to the auditory style. However, if a student prefers action stories or is not a keen reader, this means the student may prefer the tactile style. Rose lists other ways to recognize our learning style preferences, as shown in Table 3.

The Characteristics of the Learning Styles (Rose, 1987).

Table 3.

The Characteristics of the Learning Styles (Rose, 1987)

When you	Kinesthetic and Tactile	Auditory	Visual
Spell	Write the word down to find if it feels right?	Sound out the word, or use a phonetic approach?	Do you try to see the word?
Talk	Gesture and use expressive movements? Use words such as feel, touch, and hold	Enjoy listening, but are impatient to talk? Use words such as hear, tune, and think?	Talk sparingly, but dislike listening for too long? Do you favor words such as see, picture, and imagine?
Visualize	Have few images, all involving movement?	Think in sounds?	Do you see vivid, detailed pictures?
Concentrate	Become distracted by activity around you?	Become distracted by sounds or noises?	Do you become distracted by untidiness or movement?
Meet someone again	Remember best what you did together?	Forget faces, but remember names? Remember what you talked about?	Do you forget names, but remember faces? Remember where you met?
Contact people on business	Talk with them while walking or participating in an activity?	Prefer the telephone?	Do you prefer direct, face-to- face, personal meetings?
Relax	Prefer to play games or work with your hands?	Prefer to listen to the radio, music, or read?	Do you prefer to watch TV, a play, or movie?
Try to interpret someone's mood	Watch body movement?	Listen to tone of voice?	Do you primarily look at facial expressions?
Read	Prefer action stories or are not a keen reader?	Enjoy dialogue and conversation, or hear the characters talk?	Do you like descriptive scenes? Pause to imagine the action?
Do something new at work	Prefer to jump right in and try it?	Prefer verbal instructions or talking about it with someone else?	Do you like to see demonstrations, diagrams, slides or posters?
Put something together	Ignore the directions and figure it out as you go along?	Like to talk with someone or find yourself talking out loud as you work?	Do you look at the directions and the picture?
Need help with a computer application	Keep trying to do it or try it on another computer?	Call the help-desk, ask a neighbor, or growl at the computer?	Do you seek out pictures or diagrams?
Teach someone	Do it for them and let them see how it's done or ask them to try it?	Prefer to tell them?	Do you prefer to show them?

At the end of Rose's book, he provides hints that instructors may use to assist students in using their preferred styles. For visual learners, instructors need to use graphics, color coding, and written directions to reinforce learning. However, instructors may want to use audio versions of text-materials or exams with auditory learners. Also, auditory learners learn by interviewing or by participating in discussions. On the other hand, kinesthetic learners should engage in an experience (model construction, lab work, and role playing). Kinesthetic learners need frequent breaks in study periods. They memorize or drill while they are walking or exercising. Paul Ginnis (2002) reported that 29% of an average adult class of learners were visual learners, 34% were auditory learners, and 37% were kinesthetic learners. These averages notify us of the importance of considering all the three learning styles.

In addition to supporting instruction with examples, the second implication of cognitive theories is that Svinicki (1991) encourages instructors to help students learn to recognize the cues that signal important information. Recognizing the cues is helpful to learners because it teaches them an efficient way to study any subject matter.

The last implication of cognitive theories is that Svinicki (1991) advises instructors to give learners time to pause frequently to help them recall and understand the part that they have just gone through. Pause time is very important in traditional classes as well as in online classes. Pause time in online instruction helps learners have the time they need to facilitate their own learning, so learners can organize, in their minds, what they have just read and link it to prior knowledge. This will help them to learn the material.

A survey for traditional classes has been conducted by Mayer (1981) of two cognitive-psychology instruction techniques, which are *the concrete model* and *elaboration*. Working with novices, he compared the effects of these two techniques on enhancing learning performance, transferring knowledge, and recalling performance. The concrete model helps novices understand new technical information by providing a framework that assists them in relating the new knowledge (the instructions) to prior knowledge. An example of the concrete model, in text instruction, is to have outlines or diagrams before the instruction (advance organizer) or after the instruction (post organizer) that aim to relate the terms and/or concepts from the instruction to familiar concepts. Mayer concluded that the concrete model enhances learning outcomes, some of which are transferable, such as conceptual information. The concrete model affects exam performance more when presented before, rather than after, instruction. Furthermore, he concluded that learners who receive a concrete model before instruction recall more conceptual information and integrate information better, while learners who receive a concrete model after instruction recall more technical and format information. Mayer gave evidence that shows this model provides higher efficiency for low-ability learners (low-knowledge learners) than for high-ability learners (high-knowledge learners). Mayer found that a concrete model is useful if instructors are looking for creative solutions from learners.

The second learning technique that Mayer reviewed is elaboration, which is asking learners to put technical information in their own words by comparing two statements in instruction. He concluded that elaboration enhances learning outcomes for problems requiring creative transfer. Furthermore, he concluded that learners who use elaboration recall more information that is transferable, such as conceptual information, while learners who do not use elaboration recall more technical information. The two techniques that Mayer reviewed can be used in online instruction to enhance the learning of technical information.

2.4 Prior Research on Online Instructional Materials

The development of online instruction can be categorized into three groups: online instruction studies based on a single learning theory, online instruction models based on integrated learning theories, and online instruction studies based on technology. The following sections provide examples of these categories:

2.4.1 Online Instruction Studies Based on a Single Learning Theory

A case study of converting a stand-up training class to an interactive web site was done by Simonson (1998). She suggested presenting the same material in many ways according to the cognitive flexibility theory, which requires multiple representations of items, repetition, and avoidance of oversimplification of content. Also, she recommended that the users' home pages be simple and have links only to the pages that they need.

Another study of designing online instruction employs the concept map. Instructors usually organize subject matter hierarchically, while they present it sequentially. Moore (1995) indicates that instructors need to present subject matter hierarchically by using hypertext. This will make instruction easily shared with students and instructors, and will simplify complex instruction. Hypertext helps learners organize instruction on their own, which means each learner constructs knowledge in a unique manner. Therefore, Moore indicated that learners should create an explicit representation of their knowledge by using a tool, like HyperCard, to create *the concept map*. The concept map develops integrated frameworks for learners by arranging the key concepts of instruction from general to specific, then relates them in a meaningful way, as shown in Figure 11. Moore concluded that the students who use the concept map perform better on exams.

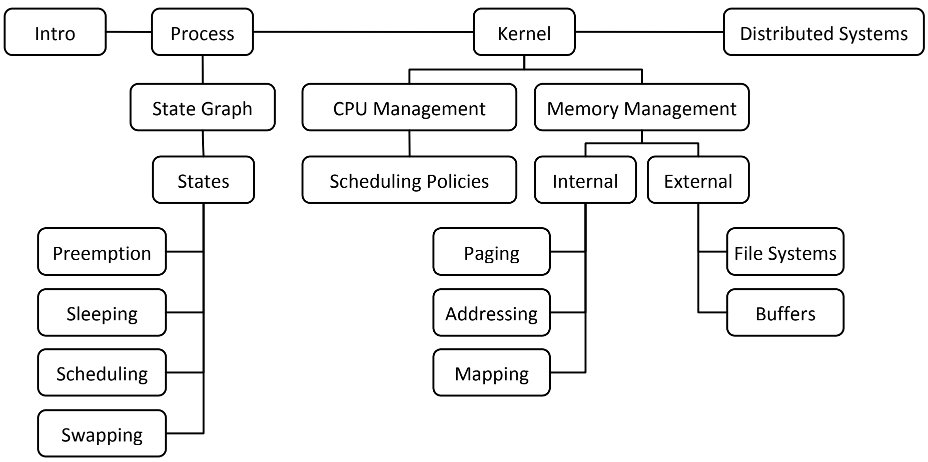


Figure 11.

An example of a concept map (Moore, 1995)

Both the concept map and the concrete model are a way to organize instruction. The concrete model is instructor-centered, and it is more effective when it is presented before, rather than after, instruction (Mayer, 1981). The concept map is learner-centered, and it has to be done after instruction.

2.4.2 Online Instruction Models Based on Integrated Learning Theories

Alghazzawi (2004) developed the GOALAPE model using the cognitive theory to help redesign technical knowledge online so that it is organized and simple to suit different learning styles. He reported that the GOALAPE model successfully simplifies the complexity of the Windows Services concept for computer novices. The GOALAPE model, as shown in Figure 12, consists of seven steps: Gather all content, Organize topics, Ask question, List terms, Audio, Printable, and E-help avatars. The *Gather all content* step puts the entire context for a given topic on one page without any limit to the number of the words including all relevant terminology. The *Organize topics* step breaks the page into main chunks/subtopics and links them together under a consistent interface design. The *Ask question* step breaks the main chunks/subtopics into second level chunks within each page; these subsections may be couched in terms of questions. The *List terms* step creates hyperlinks for terminology and moves the definition from the context onto a separate page. The *Audio* step provides an audio version of a part of, or the entire, context. The *Printable* step provides a downloadable version of the entire context in printable format like PDF. Finally, the *E-help avatars* step provides help avatars as a virtual aid.

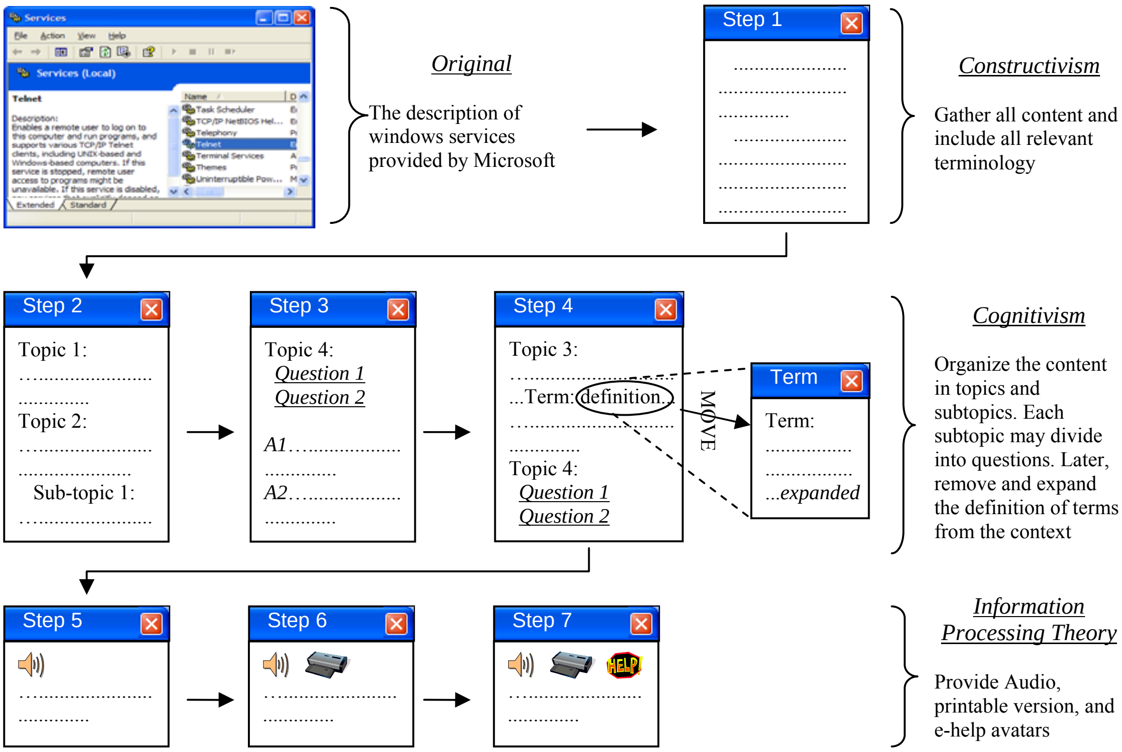


Figure 12.

The GOALAPE model (Alghazzawi, 2004)

2.4.3 Online Instruction Studies Based on Technology

Many studies have been conducted by researchers whose main focus is to involve as much technology as possible in designing online instruction, without any consideration to any learning theory. Some of these studies embed useful technologies that enhance the capability of the learners to achieve the goal quickly, such as having a video stream of the class online. However, other studies embed technologies that cause confusion for the learners because they either do not suit the type of instruction or complicate the instruction. Therefore, embedding technology in online instruction requires a great of research. This section presents some research on online instruction that does not appear to relate to any learning theory.

The NEW system is an example of an open-source web-based system for synchronous distance education not supported with any learning theory (Snow et al., 2005). The NEW system provides its users with 5 main benefits. The first benefit is that the NEW system is convenient for students because they have the ability to participate synchronously in a live class in addition to the ability to play back the class recording later. The second benefit is that the NEW system is convenient for instructors because it simplifies the process for them. The third benefit is that the NEW system is conservative in the use of network capacity because it delivers high-quality presentation over low bandwidth. The fourth benefit is that the NEW system is conservative in capital and operating costs because it does not require special training or special hardware. The last benefit is that the NEW system is entirely an open-source system. The research does not show any significant difference in the exam grades between students in the classroom and the NEW system students.

2.5 Tracking Systems for Online-Instructional Users

2.5.1 Lamprey System

Felciano and Altman (1996) developed the Lamprey system, which tracks users' clicks transparently and tracks usage across the entire Web in order to evaluate web-based user interfaces with biomedical information systems. Lamprey tracks all the navigated pages by rerouting them to a central tracking gateway, as shown in

Figure 13. Its contributions are that the results of the tracks are represented both quantitatively and qualitatively. The frequency of visited web pages provides valuable qualitative information to site designers about site organization. Also, the system evaluates user-interfaces quantitatively by providing alternative interfaces to a user, then measuring the time spent and the number of links traversed that the user takes to accomplish certain tasks.

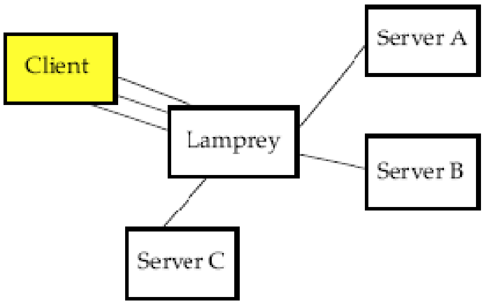


Figure 13.

The Lamprey system (Felciano & Altman, 1996)

However, the Lamprey system has limitations, including the fact that the system does not track users' scrolls because there is no way to determine the size of their browsers. Also, the system does not track the time spent for each page because the users may access online instructions from anywhere, so there is no way to determine if they get busy while they are browsing online material.

<u>2.5.2 MUD (Multi-User Dimension) System</u>

Pavel Curtis (1992) talked about his observations from his development of the MUD (Multi-User Dimension) system, which is an online chatting program for public users. His major contribution was his observation that he believes over 90% of chat users are affiliated with colleges and universities, and most of them are undergraduate students. Therefore, it appears that the best way to attract undergraduate students with instructional materials is through chat rooms that connect them.

2.5.3 eClass System

Brotherton and Abowd (2004) developed a system called eClass, which captures instructors' notes on whiteboard in traditional classes. Then after a class is over, the system creates web pages automatically, including the instructors' in-class notes, a video recording of the lecture, web sites to visit, and annotated slides. Also, the system tracks the usage of the web pages and the media (in Real Player format), then analyzes them quantitatively. The main objective of this system is to measure students' learning performance when they are provided with instructors' notes after the class.

Brotherton and Abowd (2004) evaluated eClass system's users at four universities: Georgia Tech, Kennesaw State University, McGill University, and Brown University. Then, they observed two groups of college students: a treatment group, which has access to the eClass system, and a control group, which has no access to the eClass system. Both groups attended traditional classes. In addition to the quantitative analysis that the eClass system provided at the end of the experience, the instructors asked the treatment group to fill out a questionnaire about their use of the system and asked both groups to hand in their notes.

Brotherton and Abowd (2004) found that the treatment group took fewer notes of only the most important information than the control group, so the treatment group did not lose their focus in the classes by writing everything down. The surprising result is that the eClass system does not result in decreased attendance. Also, the qualitative analysis shows that the treatment group uses eClass to review lectures, especially on exam days. Although the eClass system did not enhance the students' performance on the exams, the system helps them to study efficiently with less work. The conclusion shows the importance of instructors' notes for students when they are reviewing a lecture. Therefore, online instruction needs to support learners with some well-written notes and outlines from instructors. This way, online instruction helps learners to review lectures anytime and teaches them the best way to take notes.

2.5.4 Active Learning for Adaptive Internet (ALFANET)

The ALFANET project focuses on developing an adaptation online instruction. In ALFANET, four learning technology standards are used to provide four different adaptations. These standards are: IMS-Metadata (IMS-MD)/IEEE-LOM, IMS-Content Packaging (IMS-CP), IMS-Learning Design (IMS-LD), and IMS-Question and Test Interoperability (IMS-QIT). The first adaptation in ALFANET, Course Entry Point Adaptation, adapts the course entry point of individuals, depending on individuals' prior knowledge. The second adaptation, Content Adaptation, adapts the course content in two cognitive learning styles: inductive visually and deductive verbally. ALFANET uses questionnaires to determine the individuals' cognitive learning styles. The third adaptation, Test Adaptation, adapts an assessment depending on scores. The fourth adaptation, Learner Recommendation Adaptation, adapts recommendations to learners based on individuals' progress.

2.6 Artificial Intelligence and Expert Systems

Artificial Intelligence (AI) is a very broad research area that can be applied to a wide range of applications, such as solving intellectual problems, controlling robot motions, interpreting human language, and learning new skills and knowledge. AI research has been divided into ten primary and overlapping research areas (Doyle & Dean, 1996). These areas are: knowledge representation and articulation, learning and adaptation, deliberation planning and acting, speech and language processing, image understanding and synthesis, manipulation and locomotion, autonomous agents and robots, multi-agent systems, cognitive modeling, and mathematical foundations. This research focuses on the learning and adaptation area.

The essential element based AI architectures that can achieve the purpose of AI is called *Agent*. The agent is the entity that interacts with its environment. An agent perceives its environment through sensors, and it can change the environment through actuators. The set of inputs at a given time is called a *percept*, and the operation involving an actuator is called an *action*.

An agent consists of three basic elements that form the foundation, three kinds of knowledge, and a framework (F. Hayes-Roth, Summer 1997), as shown in Figure

14. The first element, Representation, represents the problem so it can be solved. The first knowledge, Domain Knowledge, gives a brief description about the problem and what must be focused on. The second element, Inference, provides solutions to the problem using the domain knowledge. The second knowledge, Domain Expertise, is similar to the expert person in the field of the problem. The third element, Control, filters the solutions from the second elements based in the Domain Expertise. The third knowledge, Management Know-How, helps represent the solution. The framework, Problem-Solving Architecture, inserts all the elements and knowledge together to be worked in any environment and become *Expert Systems*. An expert system is "a computer program that simulates the way human experts solve problems – an artificial decision maker" (Grabinger, Wilson, & Jonassen, 1990).

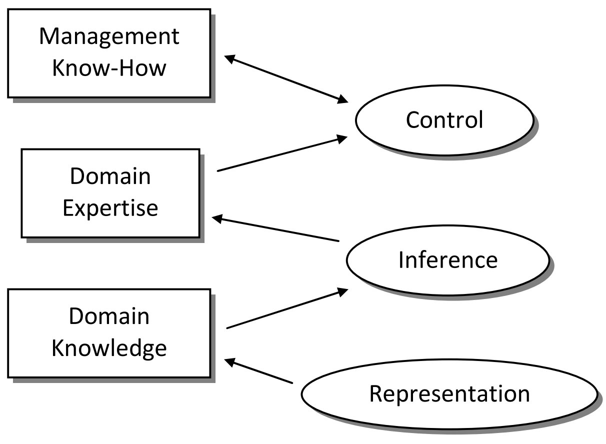


Figure 14.

Basic elements and knowledge in AI agent (F. Hayes-Roth, 1997)

There are a number of different problem-solving architectures, such as rule-based systems, case-based reasoning systems, and blackboard systems. The next sections review these architectures.

2.6.1 Rule-Based Systems

The rule-based system is the simplest form of artificial intelligence, where the knowledge is encoded in a set of *rules*. These rules are similar to if-then statements where there are left- and right-hand sides. When the left-hand side, *fact*, of a rule becomes true, the rule will *fire*. Firing a rule means this rule will be placed in the *agenda* until its right hand side, *action*, executes. The agenda may have more than one rule waiting to be executed without any clear order about which one will execute next.

The main advantage of this approach is the flexibility of maintaining the knowledge, while the main disadvantage of this approach is that rule-based systems are implemented as single-thread programs. Rule-based systems are used in many applications, such as credit card authorization, e-commerce, and personalization.

2.6.2 Blackboard Systems

The concept of the blackboard was conceived in the 1970's so multiple expert agents could share knowledge to solve a problem. The first architecture developed for the blackboard, *Hearsay II*, was for language understanding (Erman, Hayes-Roth, Lesser, & Reddy, 1980). Later varieties of architectures have been developed such as BB1 (B. Hayes-Roth, 1985).

The blackboard architecture consists of three basic components. The first component, a set of *knowledge sources*, contains specific knowledge about the problem domain. The second component, *blackboard*, is a global database used to share data through which the knowledge sources communicate to each other. Each knowledge source shares the facts on the blackboard, and it contributes to solve the problem if any fact on the blackboard matches its own. This contribution will appear on the blackboard, and the action will record to an *Agenda*. The third component, *a control mechanism*, determines the order of the knowledge sources that will operate on the blackboard.

The Hearsay-II blackboard system (Erman et al., 1980), the basic blackboard architecture, has the same three basic components indicated. In more detail, there are three elements in the control mechanism: Scheduler module, Blackboard Monitor module, and Focus-Of-Control database. The *Scheduler* influences the flow of controls between the knowledge sources, and it determines the next knowledge source that will activate based on the *focus-of-control database*, which is updated by the *blackboard monitor*. So, the blackboard monitor watches the changes on the blackboard and updates the focus-of-control database according to these changes.

Blackboard architectures have many benefits and drawbacks. Some of the main benefits are: flexibility of configuration, flexible problem solving, selection of knowledge sources, multiple problem solvers, and management of multiple levels of abstraction. Some of the drawbacks of blackboard architectures are: no communications language, computational complexity of cooperation, more complex problem-solving framework, global database, and problem solvers defined at system build time.

2.6.3 Case-Based Reasoning Systems

Case-Based Reasoning (CBR) is a recent approach that solves problems and learns cases. CBR is the process of using prior cases to solve new ones. All CBR have the following steps (Marling, Sqalli, Rissland, Munoz-Avila, & Aha, 2002):

> (1) analyze the new case (or problem); (2) based on this analysis; retrieve relevant past cases from a case base; (3) based on a 'similarity metric,' rank retrieved cases according to how relevant or useful they are with respect to the new case, and select one or more 'best' cases to use in solving the new case; (4) create a solution to the new case; (5) test and explore the proposed solution; and (6) if appropriate, and the new case and its solution to the case base and index it so that it can be retrieved for future use.

There are number of advantages and disadvantages of using CBR. The main advantage is that the CBR paradigm can be combined with other approaches to facilitate a broad task (Aamodt & Plaza, 1994). Also, CBR can work in domains that lack a strong domain theory. In addition, CBR is useful in explaining or justifying a solution. On the other hand, the major drawback in this approach is that CBR may not recognize a new problem type.

2.7 Pattern Recognition

Pattern recognition is a branch of artificial intelligence that is defined as "the study of how machines can observe the environment, learn to distinguish patterns of interest from their background, and make sound and reasonable decisions about the categories of the patterns" (Jain et al., 2000). Pattern is an entity that is vaguely defined. Such patterns include DNA sequences in text form, fingerprint in image form, and speech signals in auditory form. Table 4 shows many applications for pattern recognition, such as data mining, which is the focus in this research. The main differences between these applications can be stated in the following points:

- The formats of the patterns may take the form of pixels, curves, features, and primitives.
- The functions used to recognize patterns include, but are not limited to, correlation, distance measure, discriminant function, rules, grammar, and network function.
- The category values that we try to predict could be regression or classification values. The regression value refers to the categories with continuous values. For example, the prediction of the selling price for homes may be desired. On the other hand, the classification value means that one value from a group must be predicted. For example, the best car model to purchase.
- The criteria that measures the accuracy of the recognition functions includes classification error, acceptance error, and mean square error.

Table 4.

The Pattern Recognition Models. This Table Shows the Problem Domain, Application, Input Pattern, and Pattern Classes for each Model (Jain et al., 2000)

Problem Domain	Application	Input Pattern	Pattern Classes
Bioinformatics	Sequence analysis	DNA / Protein sequence	Known types of genes / patterns
Data mining	Searching for meaningful patterns	Text document	Compact and well-separated clusters
Document classification	Internet search	Text document	Semantic categories (e.g., business, sport, etc.)
Documents image analysis	Reading machine for blind	Document image	Alphanumeric characters, words
Industrial automation	Printed circuit board inspection	intensity or range image	Defective / non-defective nature of product
Multimedia database retrieval	Internet search	Video clip	Video genres (e.g. action, dialogue, etc.)
Biometric recognition	Personal identification	Face, iris, fingerprint	Authorized users for access control
Remote sensing	Forecasting crop yield	Multispectral image	Land use categories, growth pattern of crops
Speech recognition	Telephone directory enquiry without operator assistance	Speech waveform	Spoken words

The recognition system operates in two phases: the Training (Learning) phase and the Classification (Testing) phase, as shown in Figure 15. In the training phase, the classifier is trained on a group of patterns called training datasets. During the training processing, the classifier extracts useful information called features to represent each pattern. In this phase, there is a choice between two methods: supervised learning and unsupervised learning. In the supervised method, the patterns are labeled manually by the categories to which they belong, while the patterns are not labeled in the unsupervised method. In the second phase, the classification phase, output equations from the training phase can be used to classify any pattern. The classifier in this phase assigns each pattern to a category.

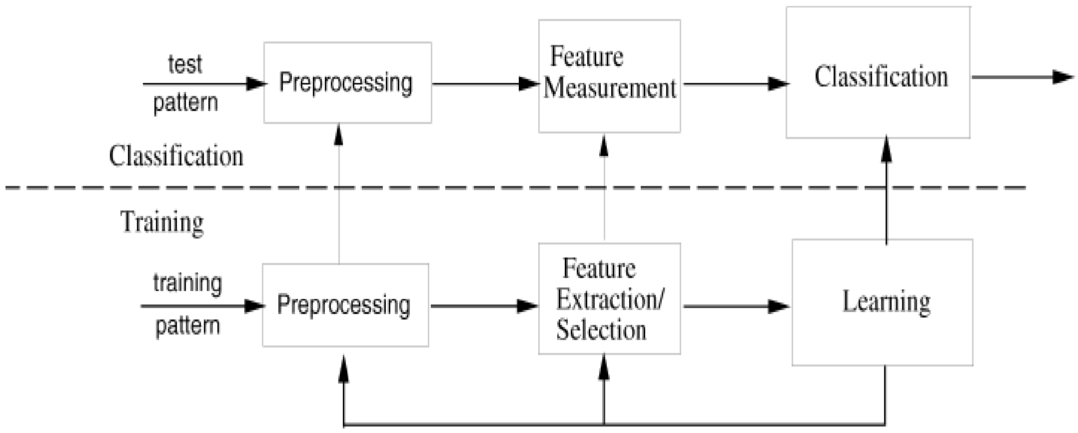


Figure 15.

The training phase and the testing (classification) phase for a recognition system (Jain et al., 2000)

After building a classifier, its accuracy must be measured. Picking the right method for estimating the misclassifying rate is very important in case the sample size is less than about one million (Jain et al., 2000). There are many methods used for estimating the errors in the classifiers. Five common methods are: Resubstitution Method, Holdout Method, Leave-one-out Method, Rotation Method (n-fold cross validation), and Bootstrap Method. The property of each of these methods and some comments about each of them are shown in Table 5.

Table 5.

The Properties of Five Common Methods for Estimating the Errors in the Classifiers (Jain et al., 2000)

Method	Property	Comments
Resubstitution Method	All the available data is used for training as well as testing; training and test sets are the same	Optimistically biased estimate, especially when the ratio of sample size to dimensionality is small
Holdout Method	Half the data is used for training and the remaining data is used for testing; training and test sets are independent	Pessimistically biased estimate; different partitionings will give different estimates
Leave-one-out Method	A classifier is designed using (n-1) samples and evaluated on the one remaining sample; this is repeated n times with different training sets of size ($n-1$)	Estimate is unbiased but it has a large variance; large computational requirement because n different classifiers have to designed
Rotation Method, n-fold cross validation	A compromise between holdout and leave-one-out methods; divide the available samples into P disjoint subsets, $1 \leq P \leq n$. Use ($P-1$) subsets for training and the remaining subset for test	Estimate has lower bias than the holdout method and is cheaper to implement than leave-one-out method
Bootstrap Method	Generate many bootstrap sample sets of size n by sampling with replacement; several estimators of the error rate can be defined (e.g., E0 and E632) using the bootstrap samples	Bootstrap estimates can have lower variance than the leave-one-out method; computationally more demanding; useful in small sample size situations;

There are many classifier models that can be used in the recognition system. These models can be used independently or combined with others. Jain et al. (2000) summarize some of these models, as shown in Table 6. Most of these models associate with parameters and criterion. The following sections briefly describe five common classifier models: Classic Decision Tree, TreeBoost, Decision Tree Forests, Neural Networks, Support Vector Machine, and Linear Discriminant Analysis.

Table 6.

Some Classification Methods Used in the Recognition System Independently or Combined with Others (Jain et al., 2000)

Method	Property	Comments
Template matching	Assign patterns to the most similar template	The templates and the metric have to be supplied by the user; the procedure may include nonlinear normalizations; scale (metric) dependent
Nearest Mean Classifier	Assign patterns to the nearest class mean	Almost no training needed; fast testing; scale (metric) dependent
Subspace Method	Assign patterns to the nearest class subspace	Instead of normalizing on invariants, the subspace of the invariants is used; scale (metric) dependent
1-Nearest Neighbor Rule	Assign patterns to the class of the nearest training pattern	No training needed; robust performance; slow testing; scale (metric) dependent.
k-Nearest Neighbor Rule	Assign patterns to the majority class among k nearest neighbor using a performance optimized value for k	Asymptotically optimal; scale (metric) dependent; slow testing.
Bayes plug-in	Assign pattern to the class which has the maximum estimated posterior probability	Yields simple classifiers (linear or quadratic) for Gaussian distributions; sensitive to density estimation errors
Logistic Classifier	Maximum likelihood rule for logistic (sigmoidal) posterior probabilities	Linear classifier; iterative procedure; optimal for a family of different distributions (Gaussian); suitable for mixed data types.
Parzen Classifier	Bayes plug-in rule for Parzen density estimates with performance optimized kernel	Asymptotically optimal; scale (metric) dependent; slow testing
Fisher Linear Discriminant	Linear classifier using MSE optimization	Simple and fast; similar to Bayes plug-in for Gaussian distributions with identical covariance matrices
Binary Decision Tree	Finds a set of thresholds for a pattern-dependent sequence of features	Iterative training procedure overtraining sensitive; needs pruning; fast testing
Perceptron	Iterative optimization of a linear classifier	Sensitive to training parameters; may produce confidence value
Multi-layer Perceptron (Feed-Forward Neural Network)	Iterative MSE optimization of two or more layers of perceptrons (neurons) using sigmoid transfer functions	Sensitive to training parameters; nonlinear classification function; may produce confidence values; overtraining sensitive; needs regularization; may be robust to outliers
Radial Basis Network	Iterative MSE optimization of a feed-forward neural network with at least one layer of neurons using Gaussian-like transfer functions	Sensitive to training parameters; nonlinear classification function; may produce confidence values; overtraining sensitive; needs regularization; may be robust to outliers
Support Vector Classifier	Maximizes the margin between the classes by selecting a minimum number of support vectors	Scale (metric) dependent; iterative; slow training; nonlinear; overtraining insensitive; good generalization performance

2.7.1 Decision Tree Models

The classic Decision Tree, which was popularized by Breiman, Friedman, Stone, and Olshen (1984), is a logical model represented in a binary tree. The binary tree helps users do the classification easily. Figure 16 shows an example of a decision tree that tries to classify the students into classes according to their ages.

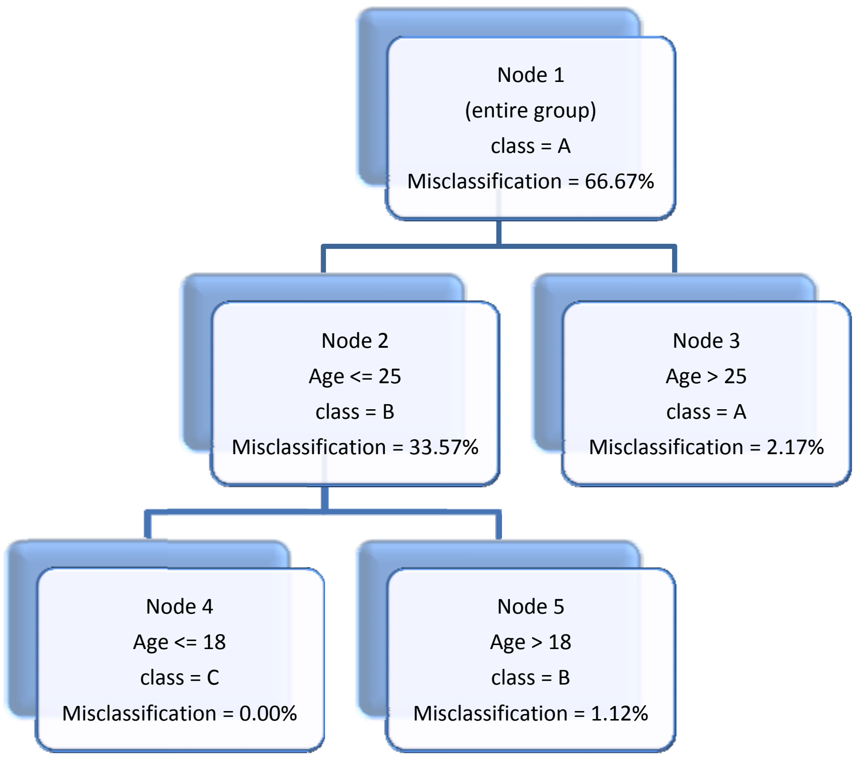


Figure 16.

An example of a decision tree

TreeBoost and Decision Tree Forest Models, ensemble of decision trees, are techniques for improving the accuracy of the predictive function.

2.7.1.1 TreeBoost Models

The TreeBoost Models, known as “Stochastic Gradient Boosting” and “Multiple Additive Regression Trees”, can be represented in a series of trees (Friedman, 1999a, 1999b). The error value from each tree feeds into the next tree in order to reduce the error. This process may be repeated hundreds of times, and the final tree is build by adding the contribution of each of these trees. Because of the complexity of this model, it cannot be visualized like the classic Decision Tree Models.

2.7.1.2 Decision Tree Forest Models

The Decision Tree Forest Models can be represented in a group of parallel trees that are independent and interact with each other at the end of the process (Breiman, 2001). In this model, the dataset is divided randomly into two groups. The first group has $^2/_3$ of the dataset and is used to build a decision tree. The second group has $^1/_3$, called Out Of Bag (OOB), and considered a test sample for the tree. Repeating these steps many times will construct a forest of trees.

2.7.2 Neural Networks

The neural networks, Multilayer Feed-Forward Network (MFLN), construct of a group of layers connecting together by a group of neurons, as shown in Figure 17. These layers are: one *input layer*, one or more layers in the middle called *hidden layers*, and one *output layer*.

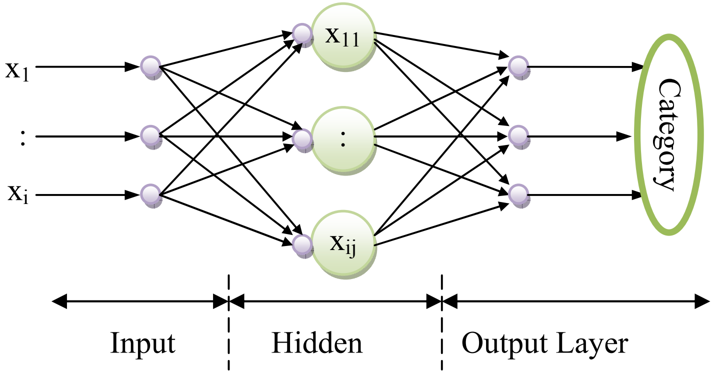


Figure 17.

The neural network model

The input layer receives *i* number of features that are standardized to produce $x_1 \ldots x_i$ values. Each value is multiplied by a weight *j*, resulting in x_{ij}, and then the values are added together and fed to the hidden layers. The output layer takes the weighted values from the last hidden layer and adds them together to produce the classification result.

2.7.3 Support Vector Machine Models

The Support Vector Machine (SVM) constructs an *N*-dimensional hyperplane that separates the datasets into two categories with *maximum margin*. Each pattern is called a *vector*, and it can be represented as a point in *M*-dimensional space (Cristianini & Shawe-Taylor, 2000). SVM defines the features' space where the training dataset will be classified using a function called the *Kernel Function*. There are many kernel functions that can used, according to the type of the dataset. For example:

1. Linear, as shown in Figure 18:

$K(x_i, x_j) = x_i^T x_j$

Figure 18.

An example of a linear kernel

2. Polynomial, as shown in Figure 19:

`K(xi, xj) = (xi, xj)d  (with degree d)`

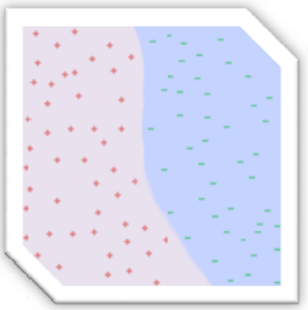


Figure 19.

An example of a polynomial kernel

3. Radial Basis Function (RBF) , as shown in Figure 20:

$$K(x_i, x_j) = \exp(-\frac{\|x_i - x_j\|^2}{2\sigma^2})$$

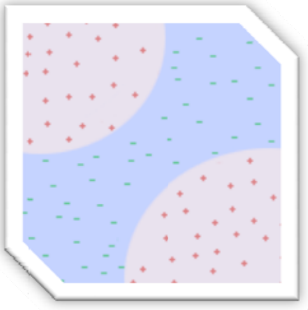


Figure 20.

An example of a RBF kernel

4. Sigmoid:

$K(x_i, x_j) = \tanh(k(x_i x_j) + \Theta)$

2.7.4 Linear Discriminant Analysis Models

The Linear Discriminant Analysis, originally developed by Fisher (1936), is used to categorize patterns with a classification value and not regression. It looks for the best linear combination of features to explain a pattern. The Linear Discriminant Analysis finds a linear transformation called *Discriminant Function* that produces a new set of transformed values from the features values that can be used for better discrimination of the patterns.

2.8 Summary

This chapter reviewed the literature in four areas that were the focus in this research. The first area focused on the four basic learning schools of thought: cognitivism, behaviorism, constructivism, and humanism. This research focused on the learning styles in cognitivism, because much of the research in this school of thought can be applied to online instruction. The second area focuses on building online instruction. There are many studies on building better instruction in the traditional or online classes. These studies were used in this research to develop an online instruction system. The third area focused on tracking systems, which were used to help in developing the two mechanisms in this research. The fourth area focused on the Artificial Intelligent and Pattern Recognition. In this research, many existing pattern-recognition models were used after extracting the features from the two developed mechanisms. All four of these areas were integrated to develop the Classification System that are capable of inferring the cognitive learning styles of its users.

In chapter 3 of this research, the Learning Object Metadata standard developed by IEEE is extended in order to suit different types of learning objects and to support Adaptive Learning Environments. Chapter 4 reviews the design of the user-interfaces and the database for the Classification System. Chapter 5 describes the research method, including the two mechanisms used in the Classification System.

3. LEARNING OBJECTS AND LESSON MAPS

This research focuses on developing and evaluating the Classification System for Adaptive Learning Environments (ALE). For this reason, a collection of learning objects must be created and packaged together to form online lessons. The current IEEE Learning Object Metadata (LOM) Standard provides a starting point for the research. This research covers the barrier of transferring traditional class notes to a group of learning objects and building lesson maps in simple steps. These steps were used to transfer three traditional lessons online and use them for the Classification System.

The IEEE LOM standard is described in Section 3.1. Three steps used to transfer traditional class notes online are presented in Section 3.2, including a simple example to illustrate each step. The three online lessons used in this research are introduced in Section 3.3. At the end, Section 3.4 concludes the main points in the chapter.

3.1 Background on IEEE LOM Standard

The IEEE Learning Object Metadata (IEEE LOM 1484.12.1) draft standard was developed by the IEEE Learning Technology Standard Committee (IEEE LTSC) in 2002 to represent learning objects. A learning object is defined by the standard as "any entity–digital or non-digital–that may be used for learning, education or training" (IEEE, 2002), such as multimedia resources, case studies, and education tools (Hirata, Yoshiyuki Takaoka, & Ikeda, 2001). LOM describes the characteristics of a learning object (IEEE, 2002) so it can be shared between individuals or institutions using a Learning Management System (LMS). This standard also addresses sharing learning objects between nations, so it permits linguistic diversity of both learning objects and the metadata that describe them.

Sharing learning objects between institutions may result in reducing the time cost of developing of a learning object and enhancing the quality of education. The cost of developing a new learning object from scratch will be reduced because of the capability to use a similar object that was developed by others. Also, the quality of education in an institution will be enhanced by using high-quality learning objects. In general, sharing high-quality objects will both reduce the time-cost of developing similar objects and enhance the quality of the field.

The IEEE LOM standard categorizes the characteristics of a learning object in nine categories: general, life cycle, meta-metadata, technical, educational, rights, relation, annotation, and classification. Each category contains a hierarchy of data elements that describe in detail the learning object or its metadata. Figure 21 shows the nine categories with their data elements. Each of the data elements may contain other data elements or it may be a leaf node (nodes at the bottommost level of the tree). Only the leaf node is defined by name, explanation, size, ordering, value space, and datatype. The datatype used in this standard could be one of the following: LangString, DateTime, Duration, and Vocabulary.

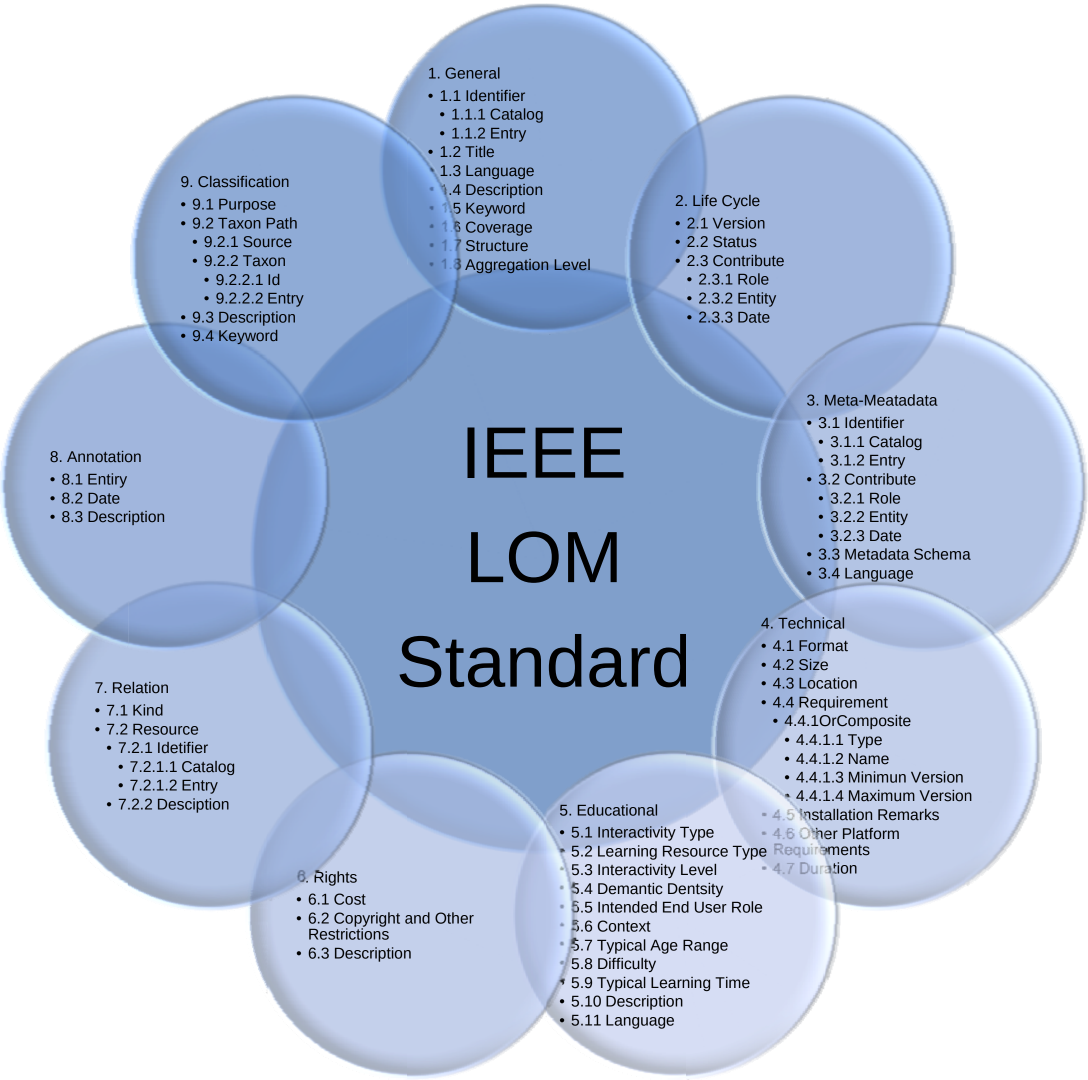


Figure 21.

The IEEE LOM categories and their data elements

3.2 Constructing Learning Objects and Building Lesson Maps

Creating learning objects and the relationship between them is one of the focuses in this research. In this section, the following two questions are answered:

How can class notes be broken into small learning objects? How can lesson maps be built from these small learning objects to visualize the relationship between them?

The IEEE LOM Standard introduces a data element called `<1.1 Identifier>` to identify learning objects without any restriction for picking up this ID. In this research, two digits were added to the Learning Object ID that reflect the type of content. Table 7 shows a list of content types with the two unique digits. So, each lesson of the subject matter needs to be divided into small learning objects according to the type of content. These types are capable of extending if a subject matter requires it.

Table 7.

The Types of the Learning Objects

Type ID	Learning Object
10	General Information
15	Overview on Topic
20	Rule / Grammar / Prototype
25	Information about the relationship between two objects
30	Example
35	Analytic information (More detail)
40	Conclusion about a topic

Three simple steps can be used to transfer class notes to a group of learning objects connected together in lesson maps. We used class notes about "Complex Logic Expression," as shown in Figure 22, to illustrate the result of each of the three steps. The class notes for this topic consist of four pages. The first page has an introduction to the topic and the three logical operators: *and*, *or*, and *not*. Then, each of the other three pages has an introduction for an operator including its prototype and examples.

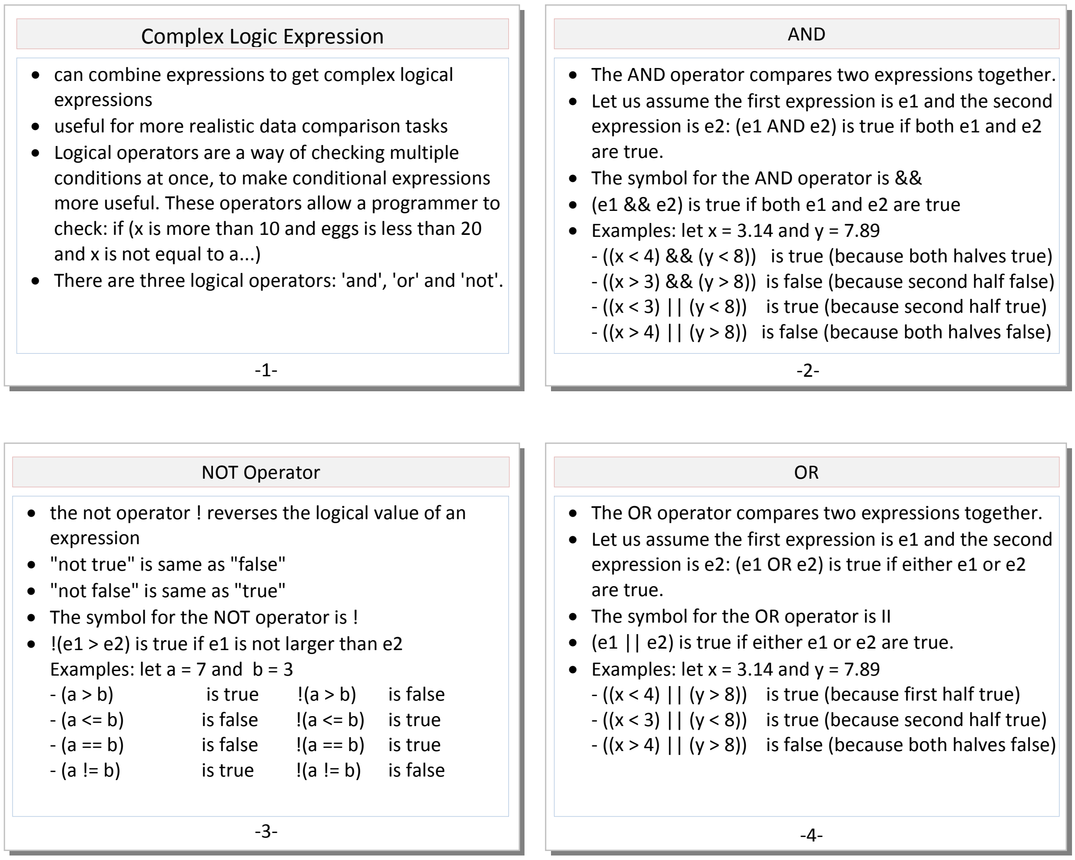


Figure 22.

The class notes for "Complex Logic Expression"

The first step is to mark the learning objects in each lesson with the two-digit numbers including the learning object ID, as illustrated in Figure 23. We need to make sure that each lesson is broken into unbreakable objects.

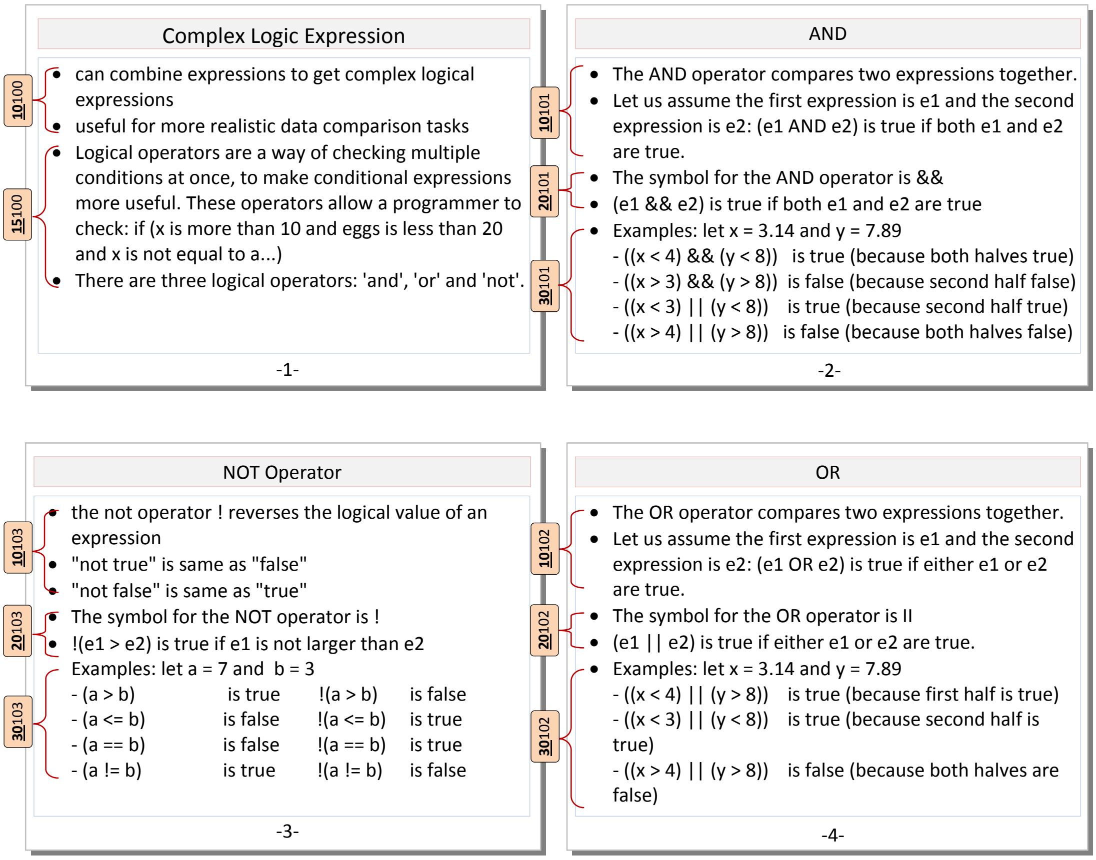


Figure 23.

The class notes for "Complex Logic Express" after applying the first step of building a lesson map

The second step is to draw a symbol for each learning object to reflect its content's type. Table 8 shows the possible types of any learning object's content, and Figure 24 illustrates the result of applying this step on the class notes for "Complex Logic Express". The *Prerequisite* symbol in Table 8 indicates the prerequisite learning objects for a learning object. If a topic prerequisites more than one learning object, it may confuse Holist learners. Therefore, any group of Prerequisite learning objects may need to be introduced by an *Overview* learning object and end up with a *Conclusion* learning object; these two learning objects can be drawn between the two horizontal lines below the *Prerequisite* symbol. For example, Figure 27 shows that the learning object `10119` has the three prerequisites `10121`, `10145`, and `10143`. Therefore, the Overview learning object, `15222`, was added to provide students with an overview about the connection between these prerequisites.

Table 8.

The Types of the Contents in any Learning Objects with Their Symbols. There are 7 Types: Information, Overview, Rule, Relation, Example, Analytic (Detail), and Prerequisite.

Type ID	Symbol	Learning Object
10	10xxx Information	General Information
15	15xxx Overview	Overview on more than one topic
20	20xxx Rule	Rule / Grammar / Prototype
25	25xxx Relation	Information about the relationship between more than on object
30	30xxx Example	Example
35	35xxx Analytic	Analytic information (More detail)
-	Prerequisite	Prerequisite

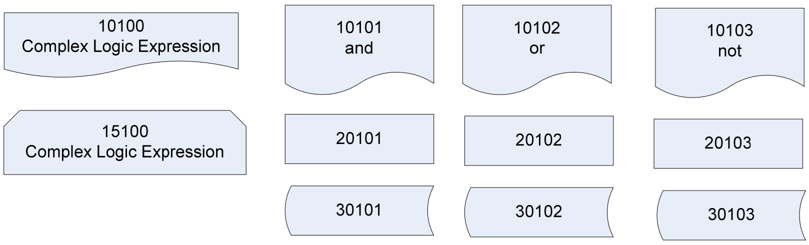


Figure 24.

The class notes for "Complex Logic Express" after applying the second step of building a lesson map

The third and last step is to connect all of these symbols together in the top-down order defined in Figure 25 in order to construct the lesson map. Figure 26 illustrates the class notes for "Complex Logic Expression" after applying this step.

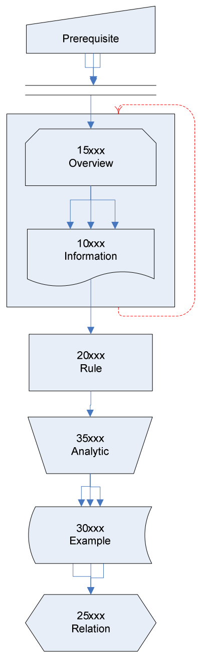


Figure 25.

The top-down order of learning objects in a lesson map

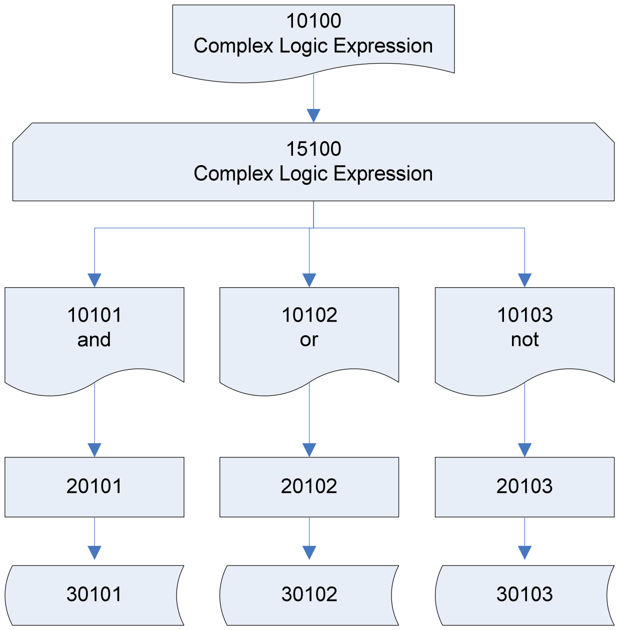


Figure 26.

The class notes for "Complex Logic Express" after applying the third step of building a lesson map

In some lessons, there may be topics, such as *Variables in C Programming Language*, that can have more than one subtopic, such as *Numbers* and *Letters*, and each of these subtopics, such as *Numbers*, may have more than one subtopic, such as *Integer* and *Float*. Both of these topic and subtopic symbols can be represented in a hierarchy tree consisting of parent and children nodes; only the leaf nodes, such as *Integer* and *Float*, can be connected to the rest of the tree. For example, in Figure 27, the main topic is the objects `10100`, `10118`, and `10119`. The subtopics for the object `10100` are `10150`, `15151`, `15152`, `15153`, `15154`, and `15155`. The subtopics for the object `10118` are `10156`, `10157`, and `10158`. These subtopics are the leaves of the topic tree because they are connecting to the rest of the tree. Because some learners, such as Holist learners, may get confused when they are introduced to many topics without an overview, an overview on the top of every horizontal group of topics was added. For example, the overview `15100` is added for the topics `10100`, `10118`, and `10119`. Also, the overview `15150` is added for the topics `10150`, `15151`, `15152`, `15153`, `15154`, and `15155`. In addition, the overview `15156` is added for the topics `10156`, `10157`, and `10158`.

In addition, three types of relationships between Learning Objects are introduced, which are: many-to-one ( ), and one-to-many ( ), and one-to-one ( ). The first relationship between learning objects, *many-to-one*, is similar to the relationship between *Prerequisite* Learning Objects and the learning object that needs them. For example, teaching students a learning object about *Classes in C++ Language* requires at least two main topics: *Function* and *Variables*. The second relationship between learning objects, *one-to-many*, can be used when we want to provide an *Overview* of a topic, such as *Operators*, and it has many subtopics, such as *adding* and *subtracting*. The last type of relationship between learning objects, *one-to-one*, can be used when we want to provide more detail about a specific rule or an example.

This research transfers three lessons from a traditional class to online learning objects. The following section illustrates these three examples, and all of them are used in the next chapter for the purpose of this research.

3.3 The Three Online Lessons Used in this Research

This research transferred three traditional lessons online using the developed three steps in Section 3.2. These thee online lessons are used in the Classification System to infer the learning styles of the users. The three lessons have been picked up from the *EECS168 – Programming I* course at the University of Kansas. The first online lesson, *Condition Statements*, represents the third lesson of the traditional class EECS168. The lesson map of this lesson is shown in Figure 27. The second online lesson, *Arrays*, represents the sixth lesson of the traditional class EECS168. The lesson map of this lesson is shown in Figure 28. The third online lesson, *Classes*, represents the ninth lesson of the traditional class EECS168. The lesson map of this lesson is shown in Figure 29. Appendix A shows the content of each learning objects in the all three lesson maps.

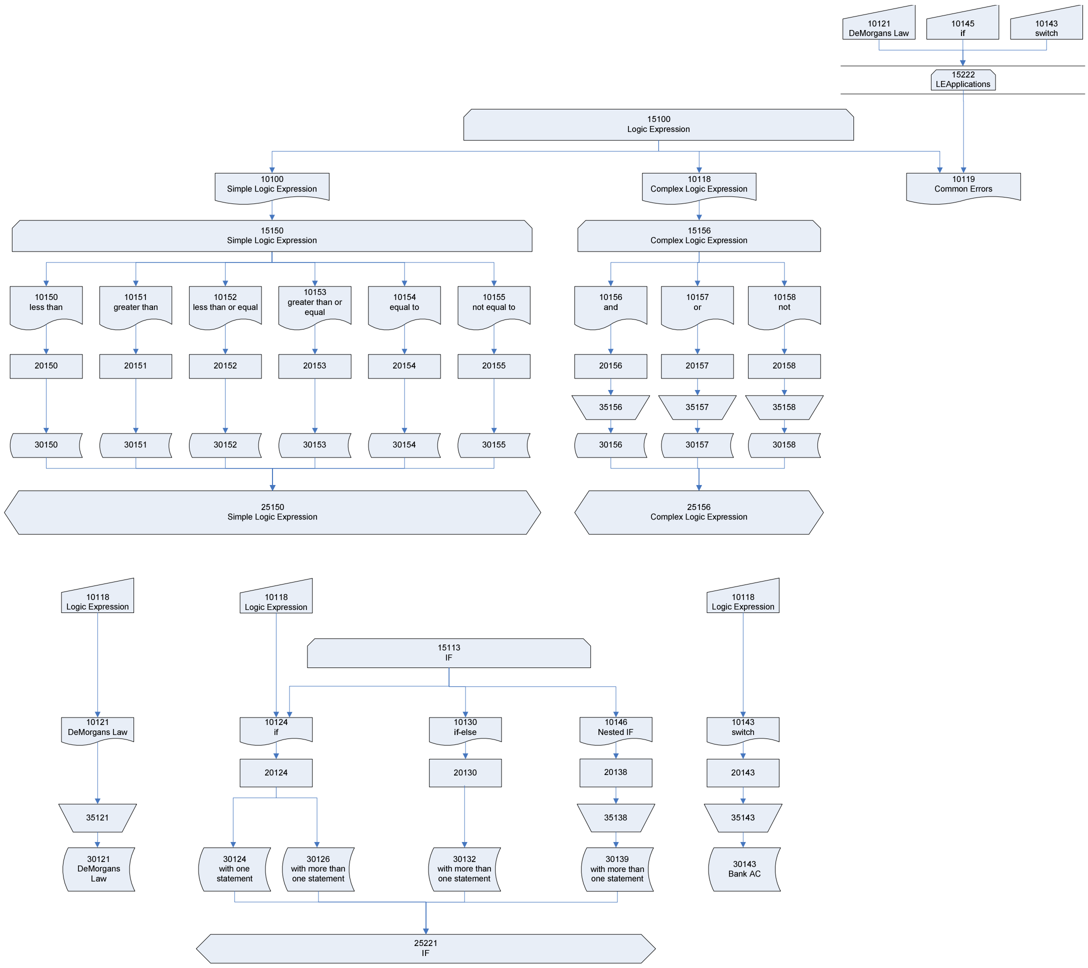


Figure 27.

The learning objects in the Classification System - the first lesson

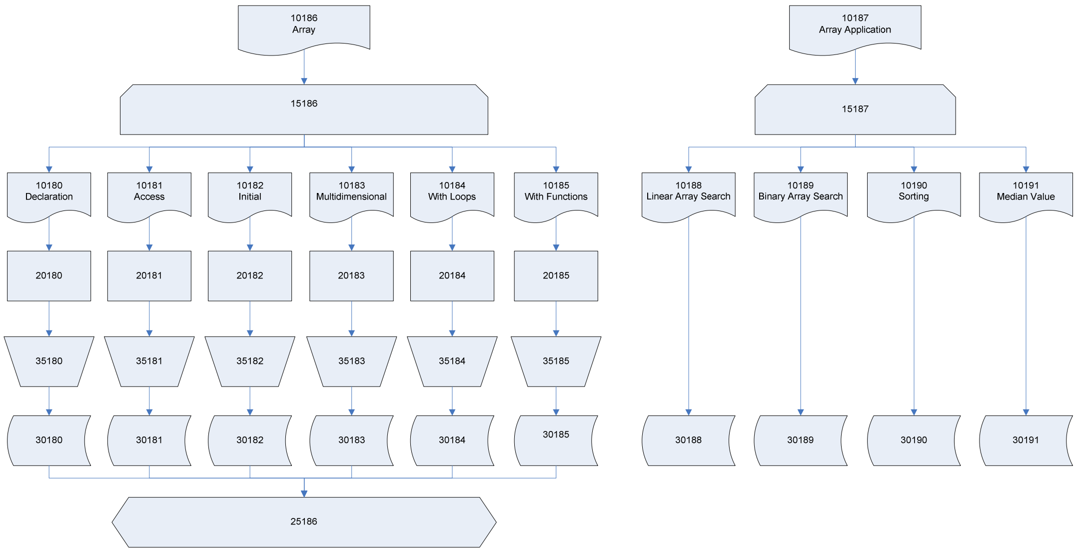


Figure 28.

The learning objects in the Classification System - the second lesson

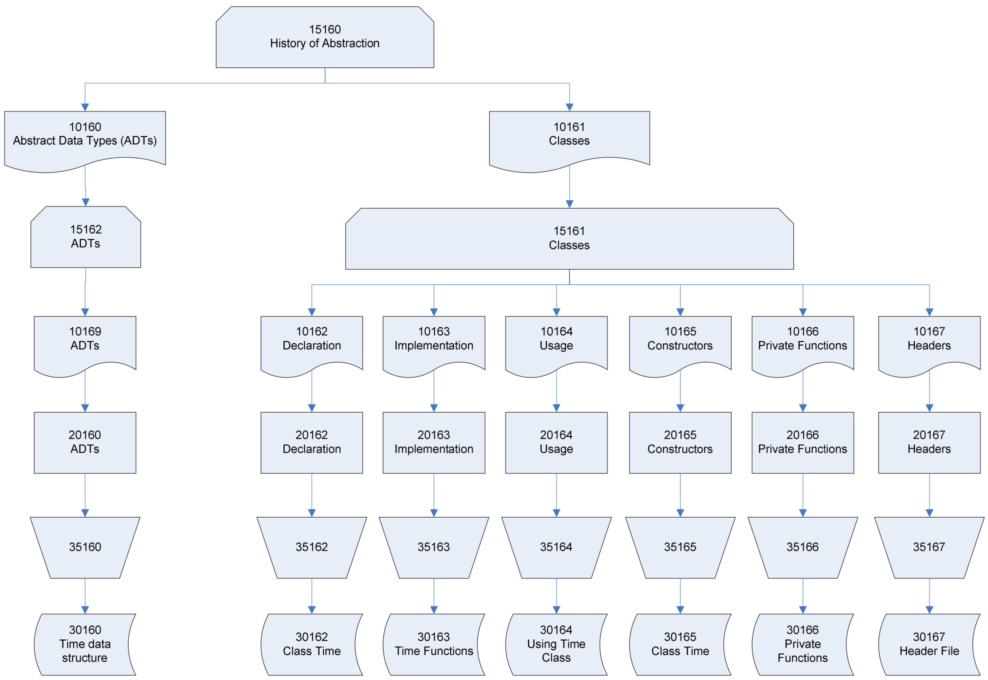


Figure 29.

The learning objects in the Classification System - the third lesson

3.5 Conclusion

In this research, three simple steps were developed to construct learning objects from traditional class notes and connecting them together to form lesson maps. These steps are used in this research to transfer the content of three traditional lessons online. These online lessons are used in Chapter 4 and Chapter 5 to achieve the purpose of this research.

4. DESIGN AND IMPLEMENTATION OF THE CLASSIFICATION SYSTEM

The Classification System aims to infer the learning styles of learners by tracking their progress on online lessons. To achieve this goal, three online lessons were created from a collection of learning objects. The learning objects were stored online in HTML format, and their metadata were stored in a database. We wanted to give users the flexibility to move from one learning object to another in a “free form” way without the need to use the two buttons, “Back Page” and “Next Page,” as in classic online lessons. Therefore, we tried to include all the learning objects for each lesson in one page, and visual cues were used, such as different shapes reflecting the type of the content and different colors reflecting the visited learning objects. The Classification System intended to provide users with the freedom to choose the learning objects that they want to see in each lesson and in the order they like.

The user interfaces for the Classification System are illustrated in Section 4.1. Section 4.2 describes the structure of the MySQL database used in the Classification System to track user interaction and other essential information. Section 4.3 describes the user interface for an administrator page that intends to be for instructors and researchers. Section 4.4 concludes the main points in this chapter.

4.1 User Interfaces

The majority of the user interfaces for the Classification System were developed using the PHP language. The only exception was the “free form” user interfaces for the lesson maps, which were developed using Flash. At the beginning, users need to login in from the login page described in Section 4.1.1. Then, they need to fill out the *Study Preference Questionnaire* described in Section 4.1.2. At the end, they need to finish the three online lessons. Section 4.1.3 illustrates the user interface of each of these lessons.

4.1.1 The Login Page

Users need to login every time they use the system in order for the Classification System to track their progress. The login page is very simple, as shown in Figure 30. An account for each of the users has already been set up, based on their class enrolment information, so they do not need to register for the system.

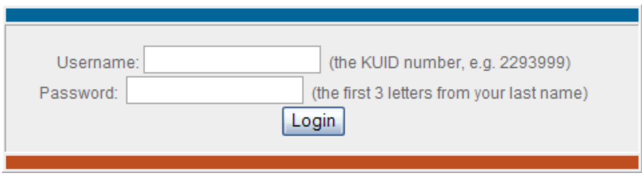


Figure 30.

The login page for the Classification System

4.1.2 Study Preference Questionnaire

When users login for the first time, they are asked to fill out an online version of the Study Preference Questionnaire (Ford, 1985). They need to complete this questionnaire in order to determine whether they are Holist, Serialist, or Versatile learners, and the results were used to evaluate the Classification System. A snapshot of the screen is shown in Figure 31.

Figure 31.

The user interface for the Study Preference Questionnaire

4.1.3 The Three Online Lessons

The page layout of all the three online lessons is the same. Each page consists of three horizontal frames, as shown in Figure 32. *The header frame* contains the two links: [Lessons Map] and [Exit], while *the footer frame* contains the lesson map. If a student clicks on any learning object in the lesson map, a query will be sent to the database about the content, and then the content will show up in *the middle frame*. The user interfaces of all three-lesson maps were built using Flash in order to make them more interactive with the students. In particular, when the mouse is moved over an item, it is highlighted. Also, when the mouse is clicked, the (x,y) position is used to identify the learning object that was selected. Finally, a different color was used to show what learning objects have been visited.

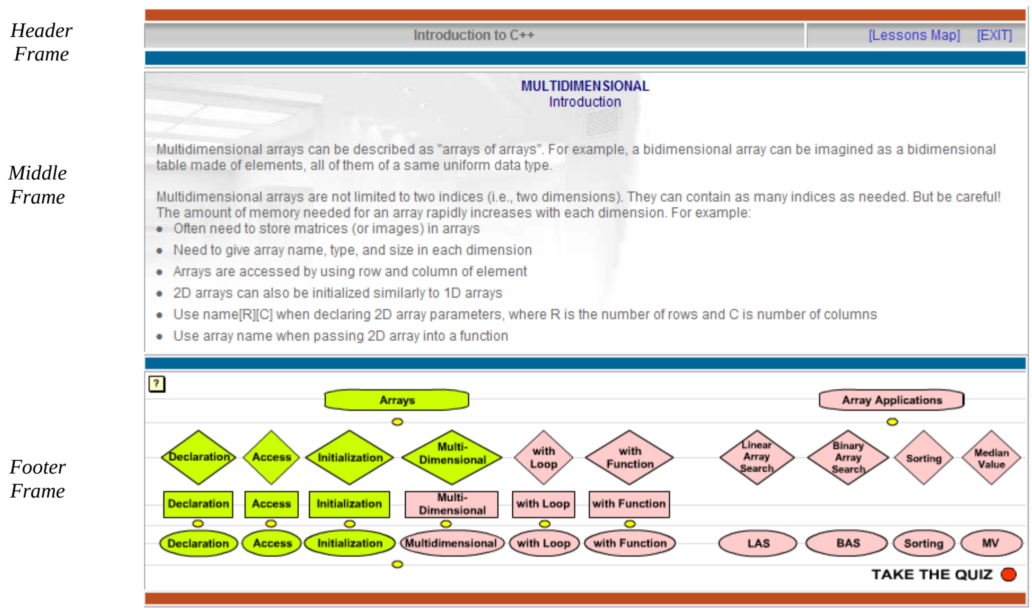


Figure 32.

The layout for the three online lessons in the Classification System.

Simple user interfaces were needed to represent the lesson maps to students. The lesson maps for the three online lessons were described in Chapter 3; however, their user interfaces need to indicate the optional learning objects (special content for each learning style) that are added to each lesson. For example, the learning objects *Overview* and *Relational (Conclusion)* were added to help Holist learners, and the learning objects *Analytical (More Detail)* were added to help Serialist learners. Therefore, different sizes of shapes were used to inform the students that some of learning objects are optional while the others are required. Students are required to visit all the learning objects that contain *Topic*, *Sub-topics*, *Prototype*, and *Example*, while they have the option to visit the others. In addition, the user interfaces aided the students to keep track of the visited learning objects, so the color of the visited learning object changes from red to green.

The students were provided with pop-up instruction during all the three online lessons that introduce them to the symbols in the lesson maps. It helps them recognize the type of the content in any learning object according to the symbols. Also, the instruction helps them indicate the required and the optional learning objects in the lesson maps. Figure 33 shows the popup window that appears if a student clicks on the help button in any lesson map. The popup window is written in Flash, so it can pop up on the top of the lesson map.

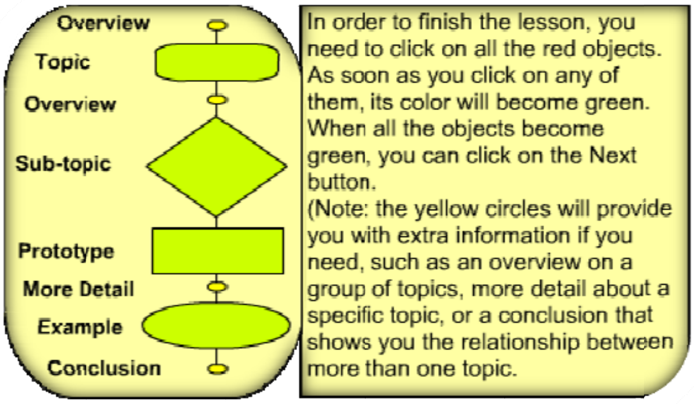
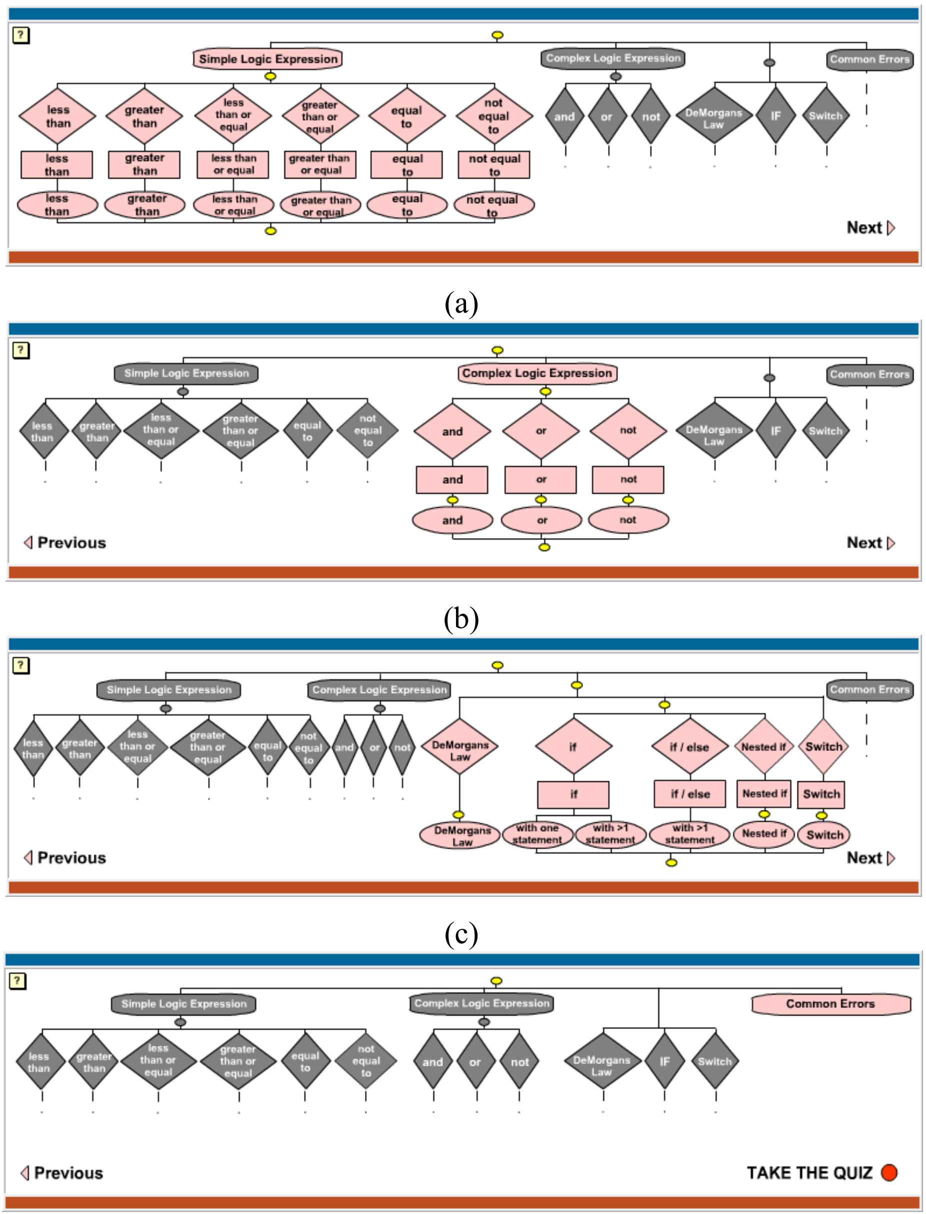


Figure 33.

The students' instruction about the layout of the lesson maps in the Classification System.

<u>4.1.3.1 The First Online Lesson: Condition Statements</u>

The first online lesson, Condition Statements, represents the third lesson of the traditional class. The original lesson map of this lesson is shown in Figure 27. The lesson map for this lesson is bigger than the space specified in the footer frame. Therefore, the lesson map was divided into four pages: Simple Logic Expression, Complex Logic Expression, IF and Common Errors. These pages are connected together by two buttons: Next and Previous. Figure 34 shows the user interfaces for all the four pages of this lesson map. Each page has a help button represented by a question mark at the top-left corner, which pops up the students' instruction in Figure 33 if a student clicks on the button.



(a)

(b)

(c)

(d)

Figure 34.

The user interface for the lesson map of the first online lesson in the Classification System. (a) The first page with Next button. (b) The second page with Next and Previous buttons. (c) The third page with Next and Previous buttons. (d) The forth page with Previous and Quiz buttons.

At the last page of the lesson map, students have to answer a short online quiz about the materials in the lesson. It was decided to give an online quiz in order to make the online lesson equivalent to the traditional class in which the instruction usually gives students a quiz after each lesson. This research does not consider the result of this quiz valuable because the students' prior knowledge about the content varies.

4.1.3.2 The Second Online Lesson: Arrays

The second online lesson, Arrays, represents the sixth lesson of the traditional class. The original lesson map of this lesson is shown in Figure 28. The interface of this lesson map has grey horizontal lines, as shown in Figure 35.

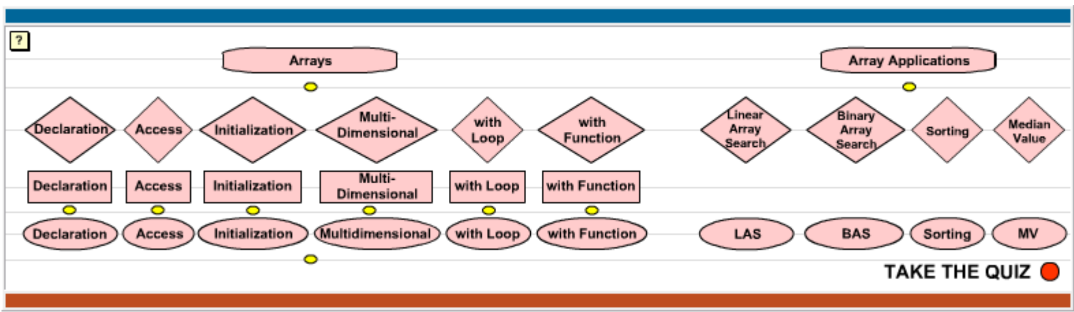


Figure 35.

The user interface for the lesson map of the second online lesson in the Classification System

At the last page of the lesson map, students have to answer a short online quiz about the materials in the lesson. It was decided to give an online quiz in order to make the online lesson equivalent to the traditional class in which the instructor usually gives students a quiz after each lesson. This research does not consider the result of this quiz valuable because the students' prior knowledge about the content varies.

4.1.3.3 The Third Online Lesson: Classes

The third online lesson, Classes, represents the ninth lesson of the traditional class. The original lesson map of this lesson is shown in Figure 29. The interface of this lesson map has grey horizontal lines, as shown in Figure 36.

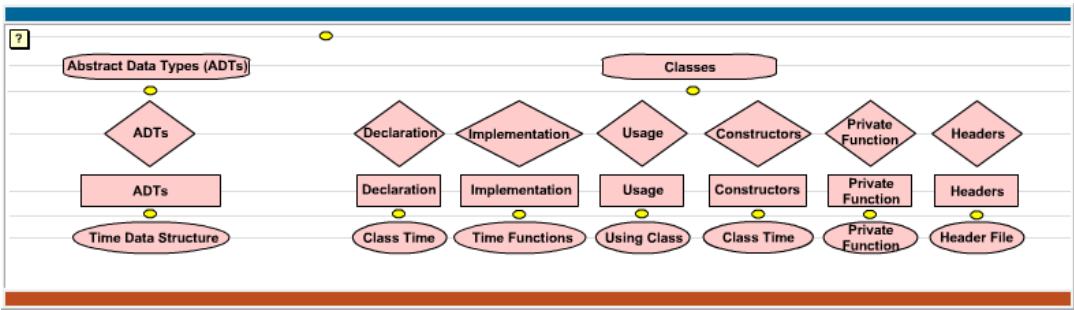


Figure 36.

The user interface for the lesson map of the third online lesson in the Classification System

In this lesson, nine questions were asked in the middle frame after a user hit on specific learning objects. Most of these questions do not have a right or wrong answer. On the other hand, their answers may help us infer the learning styles of the students. These questions and the learning objects are shown in

Table 9. The table also shows the purpose of asking each of these questions, supported by literature from Jonassen and Grabowski (1993).

Table 9.

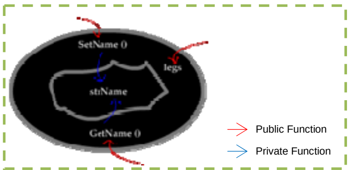
The Nine Questions Developed for the Questions Mechanism, Including the Purpose of Asking Them. In Addition, It Shows the Learning Object ID that each Question Comes With

Learning Object ID	Question	Question / Literature Review

30160 ADTs	1. [The purpose of this question is to see if you like to see content in less/more detail] - Which of the following two descriptions do you prefer to describe the following structure:
	`// Time data structure`
	`struct Time {`
	`int Hour;`
	`int Minute;`
	`int Second;`
	`};`
	○ This is a set of three integer variables that hold a time in *HH:MM:SS* format: 1. Hours: holds (*HH*), 2. Minute: holds (*MM*), and 3. Second: holds (*SS*).
	○ This is a set of three integer data types: Hour, Minute, and Second. Each of the three integer values holds a part of a specific time in *hour:minute:second* format. The first variable, which is Hour, holds the (*hour*) part of the time. The second variable, which is Minute, holds the (*minute*) part of the time. The last variable, which is Second, holds the (*second*) part of the time.
		Do students prefer less or more detail?
		
		<u>Literature Review</u>
		"a holist's learning deficiency as not focusing on enough detail.... *Serialists* use an 'operations' approach to learning, concentrating more narrowly on details and procedures before conceptualizing an overall picture.... The *versatile* learners as students who employ both holist and serialist learning strategies.... They are able to engage in both global and detailed" (p. 209)

10162 Classes – Declaration	2. Is *ADT* considered a better organization approach than *Classes*? ○ True ○ False	Can students build relationship between two topics indicated students with relational (Holist) learning style? <u>Literature Review</u> "Individuals who use a relational conceptual style place objects into categories based on functional relationships between or among the objects." (p. 221)
35160 ADTs	3. [Can you guess?] After reviewing this page, what do you think the definition of Object Oriented Program (OOP) is? ○ A computer programming methodology that focuses on data and processes. ○ A computer programming methodology that does not focus on processes or data. ○ None of the above.	Can students build concepts from detail?

Learning Object ID	Question	Question / Literature Review
30163 Classes – Implementation	4. Which of the following topics do you have no idea about at all? (If there is more than one, choose the one that you think is harder than the others) • Class Declaration • ADT • Class Implementations • Header files • Constructors • None of the above.	Do students go over the lesson map in left-to-right order and understand the contents? If so, they will be able to have a good overview on all of these topics. Literature Review "The holistic learner typically focuses on several aspects of the subject at the same time and has many goals and working topics that span various levels of the hierarchical structure." (p. 209)
30164 Classes – Usage	5. How clear are the differences between the three subtopics: Class Declaration, Class Implementation, and Class Usage? • Very clear (like sun without clouds) • Vague (like a cloudy day) • No clue about the difference (like a dark night without light)	Can students see the different between the objects in more detail? Literature Review "individuals who use an analytic,... enabling them to see the details of the object rather than be distracted by the object as a whole. As a result, these individuals see more differences between objects and, therefore, create many categories with fewer items in each." (p. 221)
20165 Classes – Constructors	6. As far as the *constructor function* works, when does the *destructor* function execute? • run when a variable is initialized • run every time use this variable • run after you finish using the variable	Can students build a general hypothesis after giving them a specific one? Literature Review "Holist: Forms specific hypotheses... Serialist: Forms generalized hypotheses" (p. 210)

<table>
<tr><th>Learning Object ID</th><th>Question</th><th>Question / Literature Review</th></tr>
<tr><td>30166
Classes – Private Functions</td><td>7. [In this question, we want to know which of the following three styles you do prefer: Visual, Verbal, or Syntax.] Which of the three following styles is the best for you to describe the differences between Public and Private in class?
○


○ Private in Class can be accessed from within the class where it is declared while Public can be accessed from anyone
○ class <class_name> {   // Declare a class
  private: //accessed by public functions only
    <data_attributes>
    <function_prototypes>
  public: // accessed from outside section
    <data_attributes>
    <function_prototypes>
};</td><td>Do students consider Visualizer, [Holist] or Verbalizer [Serialist]?</td></tr>
<tr><td>10166
Classes – Private Functions</td><td>8. After reviewing this page, which of the following statements is not true? Private section in Class can be defined as the method/variable that can be accessed from within the class where it is declared.
○ Private in Class can have methods/variables that can be accessed from within the class where it is declared.
○ Public in Class can have methods/variables that can be accessed from anyone.
○ Public and Private in Class can have methods and/or variables.
○ None of the above statements are wrong</td><td>This question is only asked to enhance the students understanding of the materials.</td></tr>
<tr><td>30167
Classes – Headers</td><td>9. If we decide to develop a C++ program using Class to translate any word from English-to-French, which of the following private data-types suits this goal better?
○ class newLanguage {
  private:
    int The_English_Word_ID;
    int The_French_Word_ID;
}
○ class newLanguage {
  private:
    int Word_ID;
    char The_French_Word[100];
    char The_English_Word[100];
}
○ class newLanguage {
  private:
    int Word_ID;
    char The_two_Word[200];
}
○ None of the above</td><td>Can students apply what they learn in their environments?

<u>Literature Review</u>
“Visually oriented individuals acquaint themselves with the environment through their vision” (p. 177)</td></tr>
</table>

4.2 Database Structure

This research aims to infer the learning style of students using the Classification System and to compare the inferred learning styles with the results of the Study Preference Questionnaire. To accomplish this goal, a MySQL database was developed consisting of six tables, as shown in Figure 37, including the relationships between these tables: one-to-one ( ) and one-to-many ( ). The primary purpose of this database is to keep track of the usage patterns of participants using the three online lessons. In addition, the database contains basic information about the participants and their responses to the online questionnaire. These tables are described in more detail below.

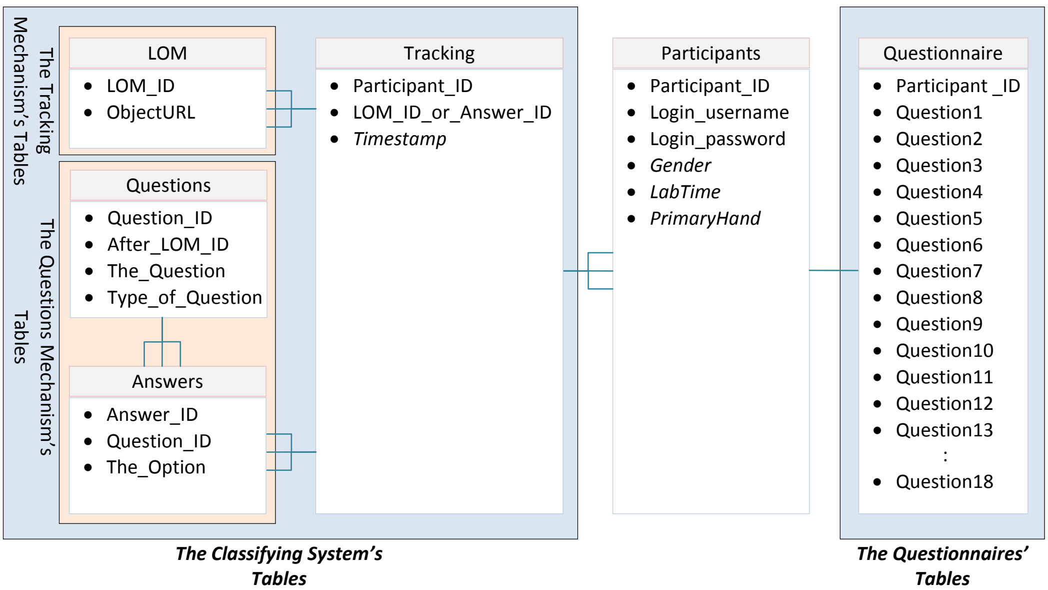


Figure 37.

The database structure for the Classification System.

The first table, *Participants*, stores the login information for each of the participants in the two fields Login_username and Login_password, including a unique ID stored in the field Participant_ID. The unique ID is used by the other tables in the database to refer to a specific participant. Also, this research used these IDs in Chapter 5 (Research Results) to refer to the participants. In addition to the login information and the unique ID, some extra information about the participants have been collected for further studies. These are the gender, the lab time, and the primary hand used in writing.

The second table, *Questionnaire*, stores the participants' response to each of the eighteen questions in the Study Preference Questionnaire. Although only five of them are needed to determine the learning style of a participant, the other questions can be used for further research. When a participant finishes filling out the Study Preference Questionnaire online, the responses of all the eighteen questions are stored in this table.

The third table, *LOM*, stores the list of the learning object IDs in the three online lessons, including the URL addresses for their contents. For example, if a participant clicks on the learning object 15113 (the learning object about *IF Condition* in the first online lesson), the webpage will send a database query to this table asking about the location of the content, this table will return the URL address, where the content of this learning object is stored.

The fourth and fifth tables, *Questions* and *Answers*, store the nine questions that need to be asked during the third online lesson, including the answer's options for each question. The `Questions` table stores each of the nine questions, along with a unique ID called `Question_ID`, the learning object ID that is supposed to show up after, and the question's type whether it is True/False or Multiple Choices. The `Answers` table stores all the possible answers for each question along with a unique ID for each answer called `Answer_ID`. So, each `Question_ID` may have more than one record in this table because each question has more than one option.

The last table, `Tracking`, keeps track of the usage patterns of the participants using the three online lessons and their responses to the nine questions in the third online lesson. Each time a participant clicks on a learning object from a lesson map, the learning object ID, along with the participant ID, is stored in this table, including the timestamp. Also, when a participant answers one of the nine questions, the answer ID, along with the participant ID, is stored in this table. The records in this table are used to infer the learning style of the participants, which is the goal of this research. In the next chapter, a correlation was calculated between the inferred learning styles from this table and the score results in the `Questionnaire` table.

In conclusion, the six tables in the databases can be classified into two primary groups connected together by the `Participants` table. The first group focuses on storing the participants' responses on the Study Preference Questionnaire in order to recognize the ground truth of the participants' learning styles. The second group focuses on storing the participants' behaviors during the three online lessons in order for the Classification System to infer the learning style of each participant. The records stored in these two groups after running the experiment are shown in Chapter 5.

4.3 Administrator Page

The Classification System has an administrator page that allows the researcher view the participants' progress over the three online lessons. In addition, this page is able to extract number of features from the students' behaviors using the tacking Mechanism and the Questions Mechanism, which are described in more detail in Chapter 5. The administrator page has a control panel with the following parameters:

- Three display styles for viewing student tracking results and other information:
  (1) As shown in Figure 38, it shows the learning object IDs with the timestamps. This page shows the following information: The unique participant ID, the login information, the lab time, the responses to the nine questions in the third online lesson, the responses to the main five items in the Study Preference Questionnaire, including the inferred learning styles from them, and the visited learning objects from each of the three online lessons, including the timestamp.
  (2) As shown in Figure 39, it shows the learning object IDs in the order they are visited. This page shows the following information: The unique participant ID, the login information, the lab time, the responses to the nine questions in the third online lesson, the responses to the main five items in the Study

Preference Questionnaire, including the inferred learning styles from them, and the visited learning objects from each of the three online lessons

(3) As shown Figure 40, it shows the Tracking Patters, which are described in more detail in Chapter 5. This page shows the following information: The unique participant ID, the login information, the lab time, the responses to the nine questions in the third online lesson, the responses to the main five items in the Study Preference Questionnaire, including the inferred learning styles from them, the Tracking Patterns for each of the three online lessons, and some of the features extracted from the Tracking Pattern

- Number of the records per page. The main reason of limiting the number of the records per page is to reduce the amount of feature-extracted calculation that the administrator page has to do for each participant every time this page is loaded.
- The lesson number to be viewed. The number that is used to represent each of the three online lessons corresponds to the lesson numbers used by the instructor of the traditional class. The first online lesson is represented as *lesson 3* in the administrator page, and the second online lesson is represented as *lesson 6* in the administrator page, and the third online lesson is represented as *lesson 9* in the administrator page.
- Lesson completed order. This feature was added for testing purposes to see the patterns for the participants who finished the three online lessons in the logic order (lesson 3 → lesson 6 → lesson →9) in contrast with the participants who jumped between these lessons.

- Output format of the extracted features. Results can be displayed using HTML and viewed by a browser, or results can be output in CSV format and imported into a spreadsheet for viewing and analysis.

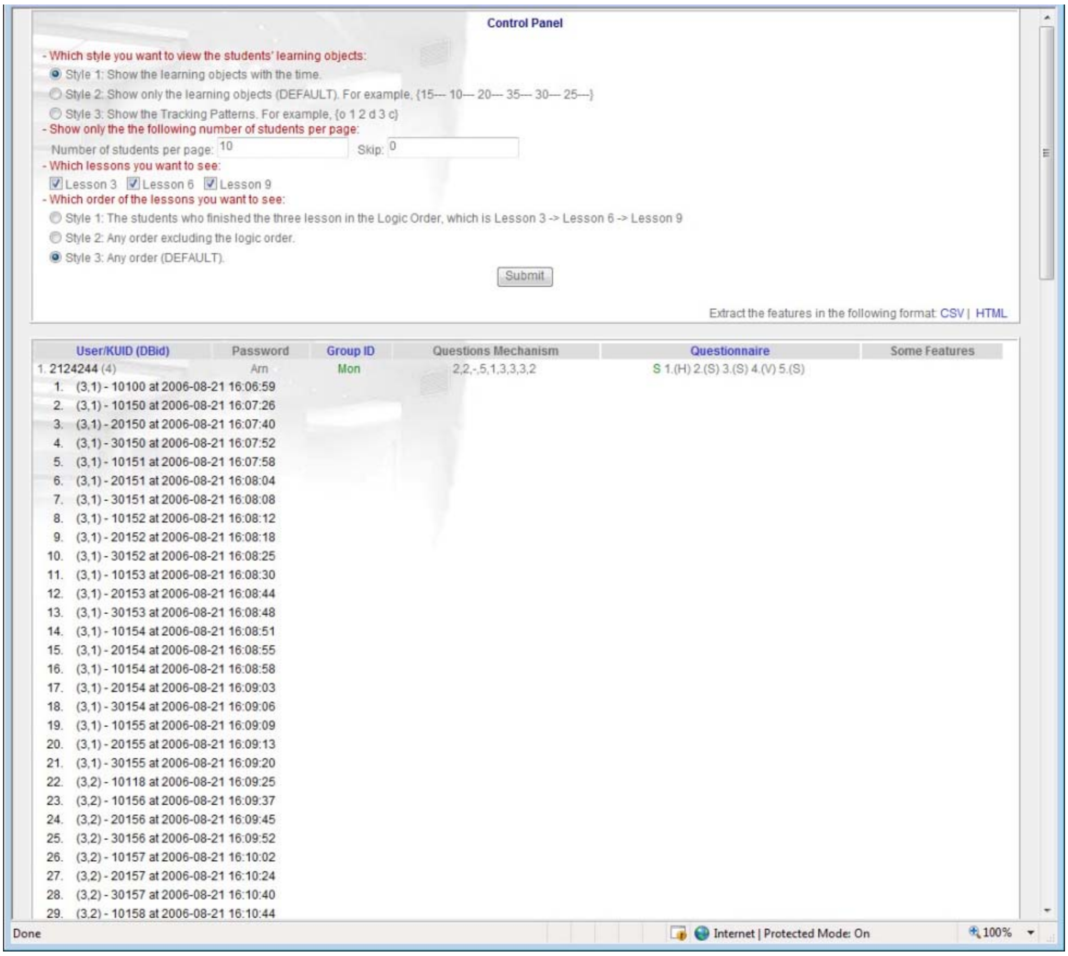


Figure 38.

The user interface for the administrator page - the first style.

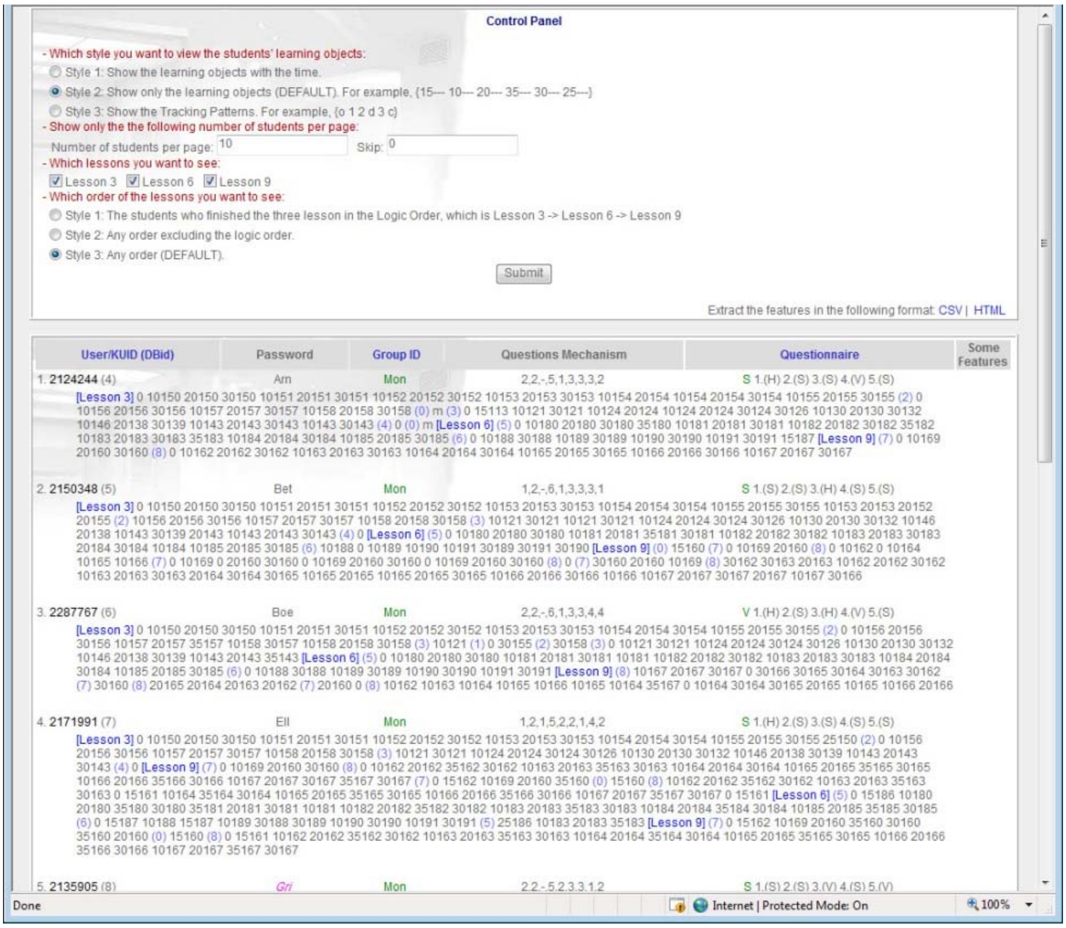


Figure 39.

The user interface for the administrator page - the second style.

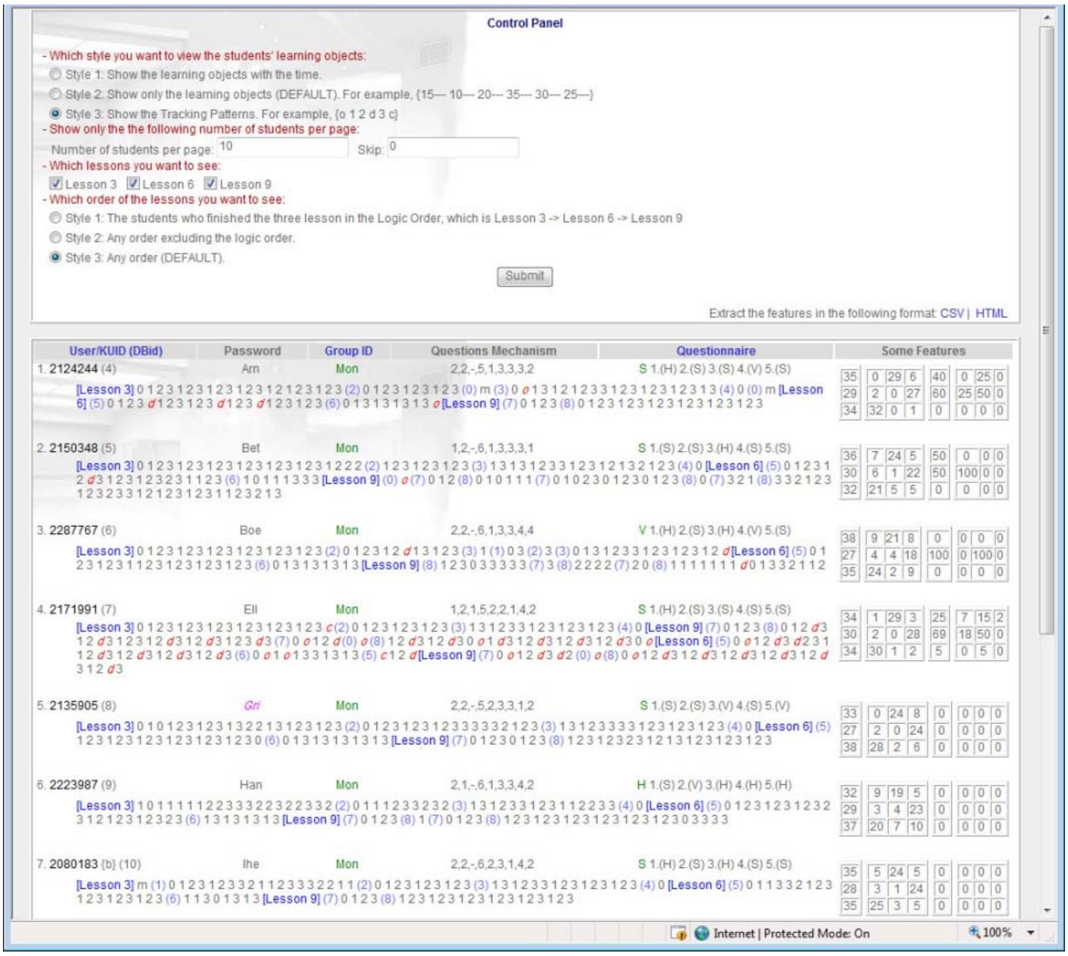


Figure 40.

The user interface for the administrator page - the third style.

4.4 Conclusion

This chapter focuses on the design issues for the user interfaces and the database structure. The primary goal in designing the user interfaces for the classification system was to provide participants flexibility while navigating the online lessons. To accomplish this goal, the user interfaces for the lesson maps were created using Flash technology that included many visual cues to guide participants, such as different shapes reflecting the type of the content and different colors reflecting the viewed learning objects. The order and times for all visited learning objects were recorded. In addition, a database was used to keep track of the usage patterns of participants using the three online lessons. The database also contains basic information about the participants and their responses to the Study Preference Questionnaire. In addition, an administrator page was created to help instructors to review the students' progresses during the online lessons and to help researcher extract number of features accurately. The user interfaces for the Classification System and the database successfully fulfilled the purpose of this research.

5. RESEARCH METHOD

The purpose of this research is to infer the learning styles of students while they are browsing online instruction. The focus of this study is on the three cognitive learning styles: holist, serialist, and versatile. In order to achieve this goal, this study developed a system, called the Classification System, which uses the mechanisms, the Tracking Mechanism and the Questions Mechanism, to extract useful information, called features, about the users' behaviors and then classifies these features to one of the three cognitive learning styles. Then, the results of this study were compared with the results of the Study Preference Questionnaire by calculating the correlation between the two results.

The remainder of this chapter is organized as follows. An overview of the hypotheses and research questions in this research is presented in Section 5.1. Section 5.2 describes the sample distribution, and Section 5.3 describes, in more detail, the timeline for testing the online lessons. An overview of the different questionnaires and the reason for choosing the Study Preference Questionnaire as a ground truth is described in Section 5.4. Section 5.5 describes the two mechanisms: (a) the Tracking Mechanism to extract features from the students clicks on the lesson maps and (b) the Questions Mechanism to extract features from the nine questions in the third online lesson. Section 5.6 concludes the research method.

5.1 The Hypotheses and the Research Questions

There are three hypotheses and five research questions this research tries to resolve. All three hypotheses try to focus on finding the correlations between (a) classifying users based on their learning styles using the two mechanisms, the Tracking Mechanism and the Questions Mechanism, during each of the three online lessons and (b) classifying users based on their learning styles using the Study Preference Questionnaire. The research questions are:

1. Does tracking the sequences of visited learning objects on each lesson map provide helpful information to infer learning styles?
2. Does asking users questions about their preference in learning styles provide helpful information to infer learning styles?
3. How many lessons does the Classification System need to examine in order to infer learning styles?
4. Which features that can be extracted from users' behaviors help to classify their learning styles?
5. Which classification models provide significant correlation between the Study Preference Questionnaire and the features extracted from each online lesson?

This chapter describes the method used to answer these hypotheses and research questions and the sample distribution in this study. Chapter 6 presents the results this method.

5.2 Sample Distribution

The participants for the study were students enrolled in the *EECS168 – Programming I* course at The University of Kansas during the fall semester 2006. This course was chosen because it is one of the required courses in the school, so it has a large number of students. The sample consisted of 67 subjects; all of whom were undergraduate students. The students needed to choose to attend one lab per week from six labs available.

5.3 Timeline

This study took place from August 21, 2006 to November 17, 2006, as shown in Figure 41. The first lesson in this traditional class started on August 19, 2006 while the last lesson was on December 5, 2006. First, the students were asked to fill out the *Study Preference Questionnaire*[1], which was developed by Ford (1985), to infer their cognitive learning styles. Next, they were asked to finish the first online lesson in the lab before the instructor taught the same lesson in the traditional class. Then, they were asked to finish the second online lesson anywhere during the same time the instructor was teaching the same lesson in the traditional class. At the end, they were asked to finish the third online lesson in the lab after the instructor had taught the same lesson in the traditional class.

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[1] A permission was given by the Human Subjects Committee, Lawrence Campus at The University of Kansas, as shown in Appendix B

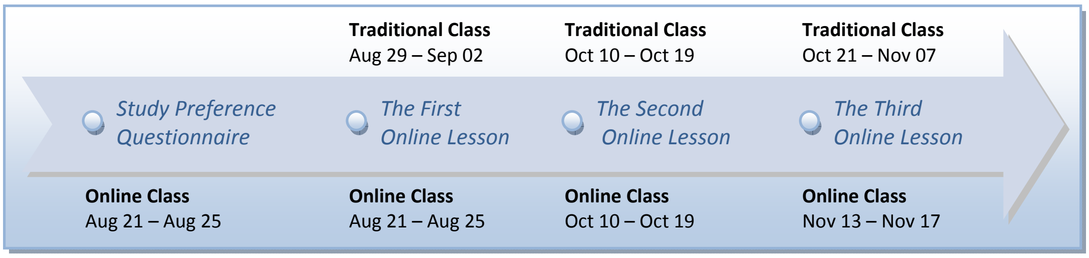

Figure 41.

The timeline for taking the online lessons and the questionnaire in the Classification System

5.4 The Reason for Choosing the Study Preference Questionnaire

Many studies (Bajraktarevic et al., 2003; Pask, 1976) proved that when holist or serialist learners matched their learning styles with the appropriate instructional style, they scored significantly higher than those who were mismatched. To accomplish this goal, many instruments have been developed. It should be stated that the score results of some instruments are either Holist or Serialist only; however, if a student score equally on both, these instruments do not provide this student with a score result. Therefore, this research includes the learning style *versatile* in addition to the two learning styles, *serialist* and *holist*. Five common instruments described briefly in the handbook written by Jonassen and Grabowski (1993) are: *Spy Ring History Test* (Pask & Scott, 1973), *Clobbits Test* (Pask, 1975), *Caste and Intuition* (Pask, 1976), *Short Inventory of Approaches to Studying* (Entwistle, 1981), and *Study Preference Questionnaire* (Ford, 1985). The score results for each of these instruments are shown in Table 10.

Table 10.

Five Common Instruments Used to Infer the Cognitive Learning Styles

#	Instrument	Score Results
1	*Spy Ring History Test* (Pask & Scott, 1973)	1. Versatile 2. Comprehension 3. Operational learning 4. Rote recall 5. Calibration
2	*Clobbits Test* (Pask, 1975)	1. Holist 2. Serialist
3	*Caste and Intuition* (Pask, 1976)	1. Holist 2. Serialist
4	*Short Inventory of Approaches to Studying* (Entwistle, 1981)	1. Achieving 2. Reproducing 3. Meaning 4. Comprehension learning 5. Operations learning 6. Versatile approach 7. Learning pathologies 8. Prediction of success
5	*Study Preference Questionnaire* (Ford, 1985)	1. Holist 2. Serialist 3. Versatile

The first instrument, *Spy Ring History Test*, is a paper and pencil test. This test is considered complex and requires a very long time and much effort. This test has five score results: versatile, comprehension, operational learning, rote recall, and calibration. The second instrument, *Clobbits Test*, as well as the third instrument, *Caste and Intuition*, focuses on distinguishing between Holist and Serialist learners only. The fourth instrument, *Short Inventory of Approaches to Studying*, is a 30-item inventory on a scale of 0-4. This test has eight score results: achieving, reproducing, meaning, comprehension learning, operations learning, versatile approach, learning pathologies, and prediction of success. The score results for all four of these instruments do not focus only on the three learning styles in this research, which are holist, serialist, and versatile.

The last instrument, *Study Preference Questionnaire*, was chosen for the purpose of this research for many reasons. The first reason is that this questionnaire consists of only 18 items, so it is simple and students can finish it in an expeditious manner. Also, students can complete this questionnaire online, so an online system can be developed to include the questionnaire, in addition to the three online lessons. This instrument also was developed in 1985, making it the most recent one of those consulted. Another important reason for choosing this instrument is that it focuses only on the three learning styles in this research, which are holist, serialist, and versatile.

5.5 Feature Extraction

Extracting useful information from the interaction between the students and the online lessons can be used to infer the learning styles of the students. These features are used by more than one classifiers in order to determine the classifiers whose significant correlated with the Study Preference Questionnaire. The results of the classifiers are one of the three categories: serialist, holist, or versatile. Chapter 6 describes these results. The classification system used two mechanisms to extract features: the Tracking Mechanism and the Questions Mechanism. The following two sections describe each of the two mechanisms in more detail.

5.5.1 The Tracking Mechanism

The first mechanism used in the Classification System is the tracking Mechanism to extract features from the students' sequence clicks on the learning objects. Each learning object is represented by one digit, according to its type. The required learning objects are represented in numbers {1: Topic, 2: Rule, and 3: Example}, and the optional learning objects are represented in letters {o: Overview, d: Detail, and c: Conclusion}. Figure 42 shows the learning objects' types in the top-down order at the lesson maps and the digit used to represent it. For example, if a student goes over ten learning objects in the following order: {`15124, 10124, 20124, 35121, 30121, 20138, 35139, 30139, 35139, 25139`}, it will be represented this way: {`o 1 2 d 3 2 d 3 d c`}. This research calls this new representation "*Tracking Patterns*."

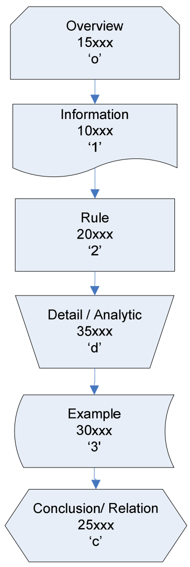

Figure 42.

Digits used to represent learning objects in the Tracking Patters

The Tracking Patterns have been chosen to classify the three learning styles because learners within each of the learning styles follow a specific pattern. Holist learners prefer to go over the Overview learning object (`15xxx`) to get a brief idea about a topic first; then they like to review all the Information learning objects (`10xxx`) in the same level. Next, they prefer to visit all the Rule learning objects (`20xxx`) following by the Example learning objects (`30xxx`). At the end, they want to reinforce their understanding of the topic by visiting the Conclusion learning object (`25xxx`). The Tracking Patterns' prototype for the holist learners is {o, 1, 1, …, 1, 2, 2, …, 2, 3, 3, …, 3, c}, while the Tracking Patterns' prototype for the serialist learners is {1, 2, d, 3, 1, 2, d, 3, …, 1, 2, d, 3, c}. The Tracking Patterns' prototype for the versatile learner is a combination of the Tracking Patterns' prototype for the serialist learners and the Tracking Patterns' prototype for the holist learners. Extracting a group of features from the Tracking Patterns is the main goal of the first mechanism in the Classification System.

Three groups of arrays, each of which consists of three arrays, were built to represent the usage patterns in the Tracking Patterns. The first group, *Numbers Only Arrays*, represents the usage patterns on only the numbers (the required learning objects) in the Tracking Patterns without letters (the optional learning objects). The second group, *Letters Only Arrays*, represents the usage patterns on only the letters (the optional learning objects) in the Tracking Patterns without numbers (the required learning objects). The last group, *Numbers & Letters Arrays*, represents the usage patterns on the entire Tracking Patterns, including numbers and letters. Each group of arrays consists of three arrays that focus on count, pairs, and triples repeated patterns. Each value in each array is the percentage of all the values in this array. Figure 43 illustrates these nine arrays and more detail about the nine arrays is described below.

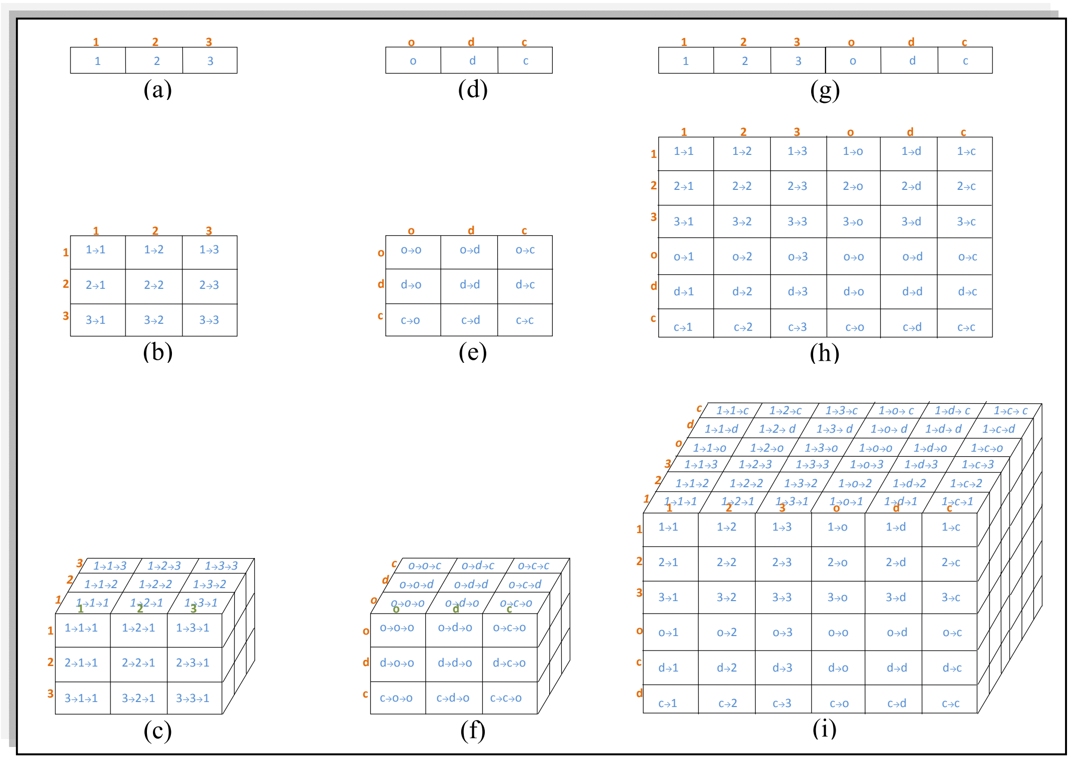

Figure 43.

The method used to extract features from the Tracking Patterns. (a) features extracted for one-dimension Numbers Only Array. (b) features extracted for two-dimension Numbers Only Array. (c) features extracted for three-dimension Numbers Only Array. (d-f) features extracted for Letters Only Arrays. (g-i) features extracted for Numbers & Letters Arrays.

The first group of arrays consists of three arrays. The first array is one dimension with three columns for the numbers only (required learning objects only) in the Tracking Patterns. Each cell in the array contains the percentage of repeated numbers in the total sum of the three numbers from the Tracking Patterns, as shown in Figure 43 (a). The second array is 3x3 for the numbers only (required learning objects only) in the Tracking Patterns. This array reads the numbers only in the tracking patters in groups of two, such as [1st number in the Tracking Patterns, 2nd number in the Tracking Patterns], [2nd number in the Tracking Patterns, 3rd number in the Tracking Patterns], and so on. The first number in each group represents the *x*-axis value of the two-dimension array while the second number represents the *y*-axis value of the two-dimension array. The values in the 3x3 array are the percentage of the total sum of each group [x,y] in the total number of the groups, as shown in Figure 43 (b). The third array is 3x3x3 for the numbers only (required learning objects only) in the Tracking Patterns. This array reads the numbers only in the tracking patters in groups of three, such as [1st number in the Tracking Patterns, 2nd number in the Tracking Patterns, 3rd number in the Tracking Patterns], [2nd number in the Tracking Patterns, 3rd number in the Tracking Patterns, 4th number in the Tracking Patterns], and so on. The first number in each group represents the *x*-axis value of the three-dimension array while the second number represents the *y*-axis value of the three-dimension array, and the third number represents the *z*-axis value of the three-dimension array. The values in the 3x3x3 array are the percentage of the total sum of each group [x,y,z] in the total number of the groups, as shown in Figure 43 (c). The total number of values in these three arrays is 39 (3 + 9 + 27) values; these values are used as features to reflect each user's behavior.

The second group of arrays consists of three arrays. They are built by taking the letters only (optional learning objects only) in the Tracking Patterns and following the same procedures in building the first group of the arrays. The total number of values in these three arrays, as shown in Figure 43 (d-f), is 39 (3 + 9 + 27); these values are also used as features to reflect each user's behavior.

The third group of arrays consists of three arrays. They are built by taking the entire Tracking Patterns (all the learning objects) and following the same procedures in building the first group of the arrays; however, 6, 6x6, and 6x6x6 arrays will be built, instead of 3, 3x3, and 3x3x3 arrays. The total number of values in these three arrays, as shown in Figure 43 (g-i), is 258 (6 + 36 + 216); these values are also used as features to reflect each user's behavior.

In conclusion, the first mechanism in the Classification System is able to build nine arrays to represent the usage patterns in the Tracking Patterns. The total number of values in all the nine arrays is 336 (39 + 39 + 258).

5.5.2 The Questions Mechanism

The second mechanism used in the Classification System is the Questions Mechanism, which is used to extract features from the students' answers to the nine questions during the third online lesson. The answers to these questions consider categories' values because they contain one of the following values {1, 2, 3, 4, 5, or

6}. The value that is chosen to be the answer on each of the nine questions is considered a feature, so this mechanism is able to extract nine features from each of the participants.

5.6 The Thirteen Classifiers

This study needed a classifier to use the features extracted from the two mechanisms and classifies participants according to their learning styles. This classifier needed to be trained on a part of the data and to be tested on the other part. Each existing classifying algorithm has a number of advantages and disadvantages. Picking the best classifier for the purpose of this study was one of the barriers. Therefore, it was decided to use 13 different classifiers, developed by a third party, on each of the three online lessons' features. Some of these classifiers share the same main algorithms with different parameters.

In addition, defining the best parameters for each classifier to enhance results was another barrier in this study. Therefore, it was attempted to define a range of values for some parameters in each of the classifiers. Then, each classifier was trained on all the entire range of these values and was tested on the same training dataset. The parameters that resulted in the lowest misclassification rate were used in the classification phase. Table 11 shows the thirteen classifying algorithms used, including a conclusion about some of the parameters used for each of them.

Table 11.

The Thirteen Classifiers Used in This Study

#	Classifier	Properties
C_1	**Single Tree**	Maximum splitting levels: 10 Splitting algorithm: Gini Minimum size node to split: 10
C_2	**Tree Boost**	Maximum trees in TreeBoost series: 400 Maximum splitting levels: 5 Minimum size node to split: 10
C_3	**C-SVM**	SVM kernel function: Radial Basis Function (RBF) C = Search from 0.1 to 50000.0 Gamma = Search from 0.001 to 20.0
C_4		SVM kernel function: Linear C = Search from 0.1 to 50000.0
C_5		SVM kernel function: Sigmoid C = Search from 0.1 to 50000.0 Gamma = Search from 0.001 to 20.0 Coef0 = Search from 0 to 100.0
C_6		SVM kernel function: Polynomial C = Search from 0.1 to 50000.0 Gamma = Search from 0.001 to 20.0 Coef0 = Search from 0 to 100.0 Polynomial degree = 3
C_7	**Discriminant Analysis**	Use frequency distribution in data set for prior probabilities for target categories
C_8	**Multi-Layer Feed-Forward Neural Network (MLFN)**	Number of layers: 3 (1 hidden) Hidden layer 1 neurons: Search from 2 to 30 Hidden layer activation function: Linear Output layer activation function: Logistic
C_9		Number of layers: 3 (1 hidden) Hidden layer 1 neurons: Search from 2 to 30 Hidden layer activation function: Linear Output layer activation function: Linear
C_{10}		Number of layers: 3 (1 hidden) Hidden layer 1 neurons: Search from 2 to 30 Hidden layer activation function: Linear Output layer activation function: Softmax
C_{11}		Number of layers: 3 (1 hidden) Hidden layer 1 neurons: Search from 2 to 30 Hidden layer activation function: Logistic Output layer activation function: Logistic
C_{12}		Number of layers: 3 (1 hidden) Hidden layer 1 neurons: Search from 2 to 30 Hidden layer activation function: Logistic Output layer activation function: Linear
C_{13}		Number of layers: 3 (1 hidden) Hidden layer 1 neurons: Search from 2 to 30 Hidden layer activation function: Logistic Output layer activation function: Softmax

The classifying phase that was conducted in this research used *v-fold technique* for validation. At the beginning, the participants in each lesson were randomly distributed in different groups, such that each group would have appropriately the same number of students in each of the three learning style. After distributing the participants into groups, all the 13 classifiers were trained on the participants from all of these groups except for one group, which was held back for testing. This process was repeated many times, and each time a different group was held for testing. At the end of this process, all the participants were used in (*v-1*) training set and one testing set. This is the main reason for choosing *v*-fold technique for validation.

The Classification System provides feedback on the importance of each input feature. These feedbacks can be used to identify the most important features for the Classification System, and which features are not valuable. Chapter 6 reports the results of all the 13 classifiers for each lesson, including the valuable features for the classifiers whose results report significant correlation with the Study Preference Questionnaire.

5.7 Conclusion

In this Chapter, the methodology of this study was described. The discussion included selection of participants, a description of the traditional course, data collection procedures, and feature extraction procedures. The quantitative data included three learning styles: holist, serialist, and versatile. The qualitative study was driven by tracking patterns from the three developed online lessons and the answers to nine questions during the third online lesson. Three hundred forty-five (345) features were extracted using the two mechanisms in the Classification System. These features are used to classify the students according to their learning styles. The results of using these features by a collection of classifiers are described in Chapter 6.

6. RESEARCH RESULTS

The purpose of this research is to infer the learning styles of students while they are browsing online instruction. The focus of this study is on the three cognitive learning styles: *holist*, *serialist*, and *versatile*. A number of features were extracted to reflect the participants' behaviors using the two mechanisms: the Tracking Mechanism and the Questions Mechanism, as described in Chapter 5. This study used 13 different classifiers in order to find the classifiers with the best significant correlation with the Study Preference Questionnaire. It was hypothesized that there would be a correlation between at least one of the 13 classifiers' score results and the score results from the Study Preference Questionnaire.

In this study, the analyses were conducted in three stages. First, quantitative data were collected from the Study Preference Questionnaire to provide the learning styles of the participants. Second, three groups of quantitative data were generated using the features extracted from each of the three developed online lessons to reflect the participants' behaviors. Third, 13 classifiers were used on each of these groups of features to generate quantitative data that predict the learning styles of the participants on each lesson. Finally, correlation analysis was conducted to examine the degree and direction of relationships between the Study Preference Questionnaire and each of the 13 classifiers on each of the three online lessons.

6.1 The Study Preference Questionnaire's Results

The first stage in this research was to collect quantitative data from the Study Preference Questionnaire to provide the learning styles of the participants. The questionnaire uses a 5-point scale that reflects the participants' opinions on 18 items. The instrument classifies participants as Holist or Serialist on the basis of the majority responses on items 1, 8, 11, 13 and 16, as indicated by the author of the instrument (Ford, 1985). The participants who score equally high in both learning styles are classified as Versatile.

There were 67 students who participated in this study. All of them completed the Study Preference Questionnaire. Table 12 represents the participant IDs with their Learning Styles, based on responses to items 1, 8, 11, 13 and 16.

Table 12.

The Participants' Responses to the Five Items in the Study Preference Questionnaire

ID	Item 1	Item 8	Item 11	Item 13	Item 16	The Score Result
1	H	S	H	H	H	*S*
2	S	H	S	S	V	*S*
3	S	S	S	H	S	*H*
4	S	H	S	S	V	*S*
5	S	S	S	H	S	*S*
6	V	H	S	H	V	*S*
7	S	H	S	S	S	*S*
8	S	S	S	V	S	*V*
9	H	S	V	H	H	*H*
10	S	H	S	H	S	*S*
11	S	S	S	H	H	*S*
12	H	H	S	H	H	*S*
13	V	H	S	V	H	*S*
14	S	H	S	S	S	*S*
15	S	V	S	V	V	*S*
16	S	S	V	S	H	*S*
17	V	V	S	H	H	*S*
18	H	S	H	H	S	*H*
19	H	H	S	H	H	*S*
20	H	H	S	H	H	*S*
21	H	H	S	H	H	*S*
22	H	H	S	H	H	*S*
23	H	H	S	H	H	*S*
24	H	S	H	V	V	*H*
25	H	H	H	V	H	*S*
26	V	H	S	H	V	*S*
27	H	H	S	H	H	*S*
28	H	H	V	H	H	*S*
29	S	H	S	S	H	*S*
30	S	H	S	S	H	*S*
31	H	H	S	H	H	*S*
32	H	H	S	H	H	*V*
33	S	S	S	H	H	*S*
34	V	V	H	H	S	*S*
35	S	S	V	V	V	*S*
36	S	S	V	V	S	*H*
37	S	H	S	V	S	*S*
38	H	H	V	V	S	*H*
39	S	H	S	S	H	*S*
40	S	H	S	H	S	*S*
41	V	H	S	V	H	*S*
42	S	V	V	H	S	*S*
43	S	S	S	S	H	*S*
44	S	S	H	H	S	*S*
45	H	V	H	H	V	*H*
46	S	S	S	S	V	*H*
47	S	S	H	S	S	*H*
48	H	H	S	H	H	*S*
49	H	H	V	V	H	*S*
50	H	H	S	H	V	*V*
51	V	H	V	H	S	*S*
52	H	H	S	H	H	*S*
53	H	H	H	H	H	*S*
54	S	H	S	H	S	*S*
55	H	H	S	H	H	*S*
56	H	H	V	H	H	*S*
57	V	S	S	H	H	*V*
58	S	S	V	V	S	*S*
59	S	H	S	S	S	*S*
60	S	S	S	H	S	*S*
61	H	S	H	H	S	*H*
62	S	H	V	V	S	*S*
63	S	S	S	H	H	*S*
64	S	S	S	H	V	*V*
65	H	H	S	H	H	*S*
66	H	S	S	H	H	*H*
67	S	H	S	S	H	*S*

H, S, and V Holist, Serialist, and Versatile learner

6.2 Feature Extracted from the Three Online Lessons

The study extracts a number of features from the interaction between the participants and each lesson of the Classification System in order to infer their learning styles. These extracted features are used by a collection of classifiers to predict the participants' learning styles and compare them to the results from the Study Preference Questionnaire.

Two mechanisms were used to extract features. The first mechanism, the Tracking Mechanism, was used to extract features from the students' sequence clicks on the learning objects at the lesson maps. The second mechanism, the Questions Mechanism, was to use the answers to the nine questions in the third online lesson as features. The following two sections describe the results of these two mechanisms.

6.2.1 The Tracking System's Results

There were 67 participants in this study. All of them completed the Study Preference Questionnaire. Only 64 of them finished the first online lesson, 63 of them finished the second online lesson, and 63 of them finished the third online lesson, but the students who finished the third online lesson were not the same as the students who finished the second online lesson.

The sequences of each participant's clicks on the learning objects at all the lesson maps were collected. Then, each learning object was represented by one digit according to its type. The required learning objects were represented in numbers (`1`: Topic/Subtopic, `2`: Rule/Syntax, and `3`: Example), and the optional learning objects were represented in letters (o: Overview, d: Detail, and c: Conclusion) as illustrated in Figure 5.2. This research called this new representation “*Tracking Patterns*.”

Table 13 shows the Tracking Patterns of all the 67 participants, sorted by the questionnaire’s score results. The table also indicates the lesson number to which each group of Tacking Patterns belongs.

Table 13.

The Tracking Patterns for Each of the Participants

ID	LS	Tracking Patterns
1	*H*	[lesson 1] 1 1 1 1 2 3 3 2 2 3 3 2 2 1 1 2 3 3 1 1 1 2 2 2 3 3 3 1 3 3 3 2 1 1 1 1 2 2 2 3 3 3 [lesson 2] 1 1 2 3 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 2 3 1 1 1 1 3 3 3 3 [lesson 3] o 1 2 d 3 1 2 d 3 1 1 2 d 3 1 2 3 d 1 2 3 1 2 3 1 2 3
9	*H*	[lesson 1] 1 1 1 1 1 1 2 2 3 3 3 2 2 3 2 2 3 3 2 1 1 1 2 3 3 2 3 2 1 3 1 2 3 3 1 2 3 1 1 2 2 3 3 [lesson 2] 1 2 3 1 2 3 1 2 3 2 3 1 2 1 2 3 1 2 3 2 3 1 3 1 3 1 3 1 3 [lesson 3] 1 2 3 1 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 3 3 3 3
12	*H*	[lesson 1] 1 1 1 1 1 1 2 3 2 3 2 3 2 3 2 3 2 3 c c 1 2 3 1 2 3 1 2 3 1 o d 3 1 o 1 2 3 3 1 2 3 1 2 3 1 2 1 3 [lesson 2] 1 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c 1 3 1 3 1 3 1 3 [lesson 3] o 1 2 3 1 2 3 o 1 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3
18	*H*	[lesson 2] o 1 2 d 3 1 2 1 d 3 1 2 3 1 2 d 3 1 2 3 1 2 d 3 o 1 3 1 3 1 1 3 3 [lesson 3] o o 1 2 3 1 o 2 3 1 2 3 1 2 d 3 2 1 2 1 2 3 1 2 3 d 1 2 d 3 [lesson 1] o 1 3 2 1 3 2 1 3 2 1 3 2 1 3 2 1 3 2 c 1 3 2 1 3 2 1 3 2 1 3 1 3 3 2 1 3 2 1 3 2 1 3 2 d d d c
19	*H*	[lesson 1] 1 2 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 d 1 2 3 3 1 2 3 1 2 3 1 2 1 2 3 d 3 1 2 3 1 2 3 d d 3 [lesson 2] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 2 3 1 3 1 3 1 3 1 3 [lesson 3] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3
20	*H*	[lesson 2] 1 1 1 1 1 2 3 2 3 d 2 3 3 1 2 3 c 1 2 3 3 1 2 3 1 1 3 1 3 1 3 1 3 1 3 [lesson 3] 1 2 3 1 2 3 1 2 3 1 2 d 3 1 2 3 2 1 3 1 1 3 1 2 3 2 3 1 2 d 3 1 2 3 [lesson 1] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c 1 2 3 1 2 d 3 1 2 3 1 3 1 2 3 3 1 2 3 1 2 3 3 2 1
21	*H*	[lesson 1] 1 1 1 1 1 1 2 1 2 3 1 2 3 1 2 3 2 3 1 2 3 1 2 3 1 2 3 c 1 2 3 d 3 1 2 d 3 1 2 d 3 c o 1 d 3 1 1 2 3 2 3 3 1 2 3 1 2 3 1 2 3 c [lesson 2] 1 2 d 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 3 1 3 1 3 [lesson 3] 1 2 d 1 1 1 2 3 2 3 1 2 3 2 3 1 2 3 1 2 3
22	*H*	[lesson 1] o 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 2 1 2 3 1 2 3 1 2 1 2 3 1 2 3 2 3 1 3 1 3 1 2 3 3 2 o 1 2 1 3 2 3 1 2 3 1 1 2 3 [lesson 3] 1 2 3 o 1 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 [lesson 2] 1 2 3 1 2 3 1 2 3 1 2 d 3 1 2 3 1 2 3 1 3 1 3 1 3 1 3
23	*H*	[lesson 1] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c 2 1 3 3 2 1 2 1 2 3 2 1 2 2 2 2 1 3 3 3 3 3 3 2 1 1 1 3 3 1 2 1 3 3 3 2 2 3 3 1 1 2 1 [lesson 3] 1 2 1 d o 1 2 1 2 1 o 3 1 o 2 1 1 1 2 3 2 2 3 3 2 3 1 2 1 1 1 3 1 2 3 [lesson 2] o 1 2 3 1 2 d 1 1 2 d 3 d 2 3 1 1 2 1 3 2 d c 1 3 1 1 1 3 3 3
24	*H*	[lesson 1] o 1 1 1 1 1 1 2 2 2 2 2 2 3 3 3 3 3 3 c 2 1 1 1 1 1 1 2 2 2 2 2 3 3 3 3 3 3 1 1 1 2 2 2 3 3 3 1 d 3 o 1 2 3 3 1 2 3 1 2 3 1 2 3 1
25	*H*	[lesson 1] 1 1 1 2 3 2 3 2 3 1 2 3 2 1 2 3 1 2 3 1 2 3 d 1 2 3 1 2 3 o 1 d 3 1 2 3 1 3 3 1 o 1 2 3 1 2 3 1 2 d 3 1 [lesson 2] 1 2 1 2 d [lesson 3] o o 1 2 d 3 o 1 1 1 2 d 3 1 2 d 3 1 2 d 3 1 2 3 1 2 d 3 1 2 3
27	*H*	[lesson 1] 1 1 1 1 1 1 2 2 2 2 2 2 3 3 3 3 3 3 2 2 2 2 3 3 3 3 3 3 1 1 1 2 2 2 d 3 3 1 3 1 2 3 3 1 2 3 3 2 1 2 1 3
28	*H*	[lesson 1] o 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 1 2 3 c 1 2 3 d 1 2 3 1 2 d 3 c 1 2 3 o 3 1 2 3 1 2 3 d 1 3 d 1 2 3 [lesson 3] o 1 2 3 o 1 2 3 1 o 2 d 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 [lesson 2] 1 2 1 2 1 2 3 1 2 3 1 2 3 1 3 1 1 1 1 3 3 3 3
31	*H*	[lesson 1] 1 1 o 1 1 1 1 2 3 2 2 3 2 3 2 3 2 3 o 1 2 d 3 1 2 3 1 2 d d c 3 1 d 3 o 1 2 3 3 1 2 3 1 2 d 3 1 2 3 d 1 2 d c [lesson 2] o 1 d 2 d 3 1 2 d 3 1 2 d 3 1 2 1 2 2 d 3 1 2 d 3 1 2 d 3 o 1 1 1 1 3 3 3 3 3 3 [lesson 3] o 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 2 3 2 d 3 1 2 1 d 3
32	*H*	[lesson 1] o 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c 1 3 1 3 2 2 1 2 3 2 3 3 2 1 1 2 c 1 2 d 3 2 3 1 2 1 3 1 2 3 1 2 3 1 d 1 d 3 1 1 2 1 3 2 1 2 3 1 2 3 1 2 3 d 1 2 d 3 [lesson 3] 1 2 o 1 d 3 o 1 2 d 3 1 2 d 3 1 2 d 3 1 2 1 d 3 1 2 d 3 1 2 d 3 [lesson 2] 1 2 3 1 1 2 3 d 2 3 1 2 3 1 2 3 1 2 3 1 3 1 3 1 3 1 3
38	*H*	[lesson 1] o 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c 1 2 3 1 2 3 d 1 2 3 1 3 1 1 1 1 1 1 2 3 2 3 2 3 3 2 3 2 2 3 2 1 3 2 1 1 2 3 1 3 1 2 3 3 1 2 3 1 2 3 1 2 3 [lesson 2] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 1 2 d 2 3 1 2 3 1 1 3 1 3 1 3 1 3 [lesson 3] 1 2 d 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3
45	*H*	[lesson 1] 1 1 1 1 1 1 2 2 2 2 2 3 3 3 3 3 3 1 1 1 2 2 2 3 3 3 1 1 1 1 1 2 2 2 2 2 3 3 3 3 3 3 3 1 2 3 c 1 1 1 1 1 1 2 2 2 2 2 2 3 3 3 3 3 3 c 1 1 1 2 2 2 3 3 3 1 3 1 1 2 3 3 2 1 2 3 1 2 3 1 2 d 3 1 2 3 2 [lesson 2] o 1 2 3 1 2 3 2 1 3 1 2 3 3 3 1 2 3 1 d d d d 2 1 2 3 1 2 3 1 3 1 3 1 3 1 3 [lesson 3] o 1 1 2 3 2 3 1 2 3 1 2 3 1 2 d 3 1 2 3 1 2 3
48	*H*	[lesson 1] c o d d d c o o d d d c [lesson 2] 1 1 1 1 1 1 2 2 2 2 2 2 3 3 3 3 3 3 1 1 1 1 3 3 3 3 [lesson 3] o o 1 2 d 3 o 1 2 3 d 1 2 d 3 1 2 d 3 1 3 1 2 d 3 1 2 d 3 1 2 d 3 [lesson 1] o 1 2 3 1 2 3 1 2 3 2 3 1 2 3 1 2 3 c o 1 2 d 3 1 2 d 3 1 2 d 3 d d o c o 1 d 3 1 2 3 3 1 2 3 1 2 d 3 1 2 3 c

ID	LS	Tracking Patterns
49	*H*	[lesson 1] 1 1 1 1 1 1 2 2 2 2 2 2 3 3 3 3 3 3 3 1 1 1 2 2 2 3 3 3 1 3 1 2 3 3 1 2 3 2 1 3 d d 1 2 1 2 2 3 1 1 1 1 1 1 2 3 2 3 2 3 2 3 3 2 3 c 1 1 1 2 2 2 3 3 3 1 3 1 1 1 1 2 3 3 3 3 2 3 2 3 2 3 [lesson 2] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 1 2 3 1 3 1 3
50	*H*	[lesson 1] 1 1 1 1 1 1 2 2 2 2 2 2 3 3 3 3 3 3 1 1 1 2 2 2 3 d 3 3 1 1 1 1 1 2 2 2 2 3 3 3 3 3 3 1 1 1 1 1 1 2 2 2 3 3 3 2 3 3 2 2 3 1 1 1 2 2 2 3 3 3 1 1 2 1 1 1 2 2 2 3 3 3 3 3 3 [lesson 2] 1 1 1 1 1 1 2 3 2 3 2 3 3 2 2 3 3 2 1 1 1 1 3 3 3 3 [lesson 3] o 2 1 3 1 1 1 1 1 1 2 2 2 2 2 2 3 3 3 3 3 o d d d d d d d o
52	*H*	[lesson 2] o 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 o 1 3 1 3 1 3 1 3 [lesson 3] o o 1 2 d 3 o 1 2 d 3 1 2 d 3 1 2 d 3 1 2 1 d 3 1 2 d 3 1 2 d 3 o 1 [lesson 1] o 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 c o 1 2 d 3 1 2 d 3 1 2 d 3 c 1 d 3 o 1 2 3 3 1 2 3 1 2 d 3 1 2 d 3 c 1 d 1 2 3 3 1 3 1 3 1 2 3
53	*H*	[lesson 1] 1 1 [lesson 2] 1 2 3 d 3 2 3 1 2 d 3 1 2 3 1 2 3 1 2 3 1 2 3 c 1 3 1 3 1 3 1 3 o o
55	*H*	[lesson 1] o 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 o d d d 1 2 d 3 1 2 d 3 c 1 2 d 3 d 3 1 d 3 o 1 2 3 3 1 2 3 c 1 2 d 3 1 2 d 3 [lesson 2] o 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 c 1 2 d 3 1 2 d 3 c o 1 1 1 1 3 3 3 3 2 [lesson 3] o 1 2 d 3 o 1 2 d 3 1 2 d 3 o 1 2 d 3 1 2 d 3 1 d 3 1 2 d 3 3
56	*H*	[lesson 2] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 1 1 1 3 3 3 3 [lesson 3] o 1 2 3 d o 1 2 d 1 2 d 3 3 3 1 2 3 1 2 3 1 2 d 3 1 2 3 [lesson 1] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c 1 2 3 1 2 3 1 2 3 3 1 2 3 3 1 2 3 1 2 3 1 2 3
61	*H*	[lesson 3] o 1 o 1 2 d 3 o 1 2 d 3 1 1 1 1 1 2 d 3 2 3 2 1 3 2 3 2 3 [lesson 2] o 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 o 1 3 1 3 1 3 1 3 [lesson 1] o 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c c o 1 o 1 1 2 2 2 d 3 d 3 d 3 c 1 d 3 1 o 1 1 2 3 3 3 3 2 2 1 2 d d 3 3 3 c
65	*H*	[lesson 3] 1 2 3 1 1 2 3 o d 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 o d d d d d d o o d [lesson 2] o 1 2 d 3 1 2 d 3 1 2 d 3 d 1 2 d 3 1 1 1 2 2 2 3 3 3 1 3 1 2 3 d 1 2 1 3 1 3 1 1 3 1 3 1 3 1 3 1 1 3 1 1 2 3 d 1 3 1 1 3 [lesson 1] o 1 2 3 1 2 3 1 2 3 c 1 2 3 1 2 3 1 2 3 o 1 2 d 3 o 1 2 d 3 c 1 2 d 3 c 1 o 1 2 3 d 3 3 2 3 1 2 3 d 1 2 d 3 c
66	*H*	[lesson 2] o o 1 2 3 1 2 3 1 2 3 1 2 3 1 3 d d d d d 1 2 d 3 1 2 d 3 1 2 d 3 o 1 1 1 1 3 3 3 3 [lesson 3] o o 1 2 d 2 d 3 o 1 2 d 3 1 2 d 3 1 2 d 3 1 2 1 2 d 3 1 2 d 3 1 2 d 3 [lesson 1] o 1 2 3 1 2 3 1 2 3 1 2 3 2 1 3 1 2 3 c o 1 2 d 3 1 2 d 3 1 2 d 3 c 1 d 3 o 1 2 3 3 1 2 3 1 2 d 3 1 2 d 3 c
2	*S*	[lesson 3] o 1 2 d 3 o 1 2 d 3 1 2 d 3 1 2 3 d 1 2 1 2 3 d 1 2 3 d 1 2 3 d [lesson 2] 1 2 d 3 1 1 2 2 d 3 d 3 1 2 d 3 1 2 d 3 1 2 3 c 1 3 1 3 1 3 1 3 [lesson 1] o 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c o 1 2 d 3 1 2 d 3 1 2 d 3 c 1 d 3 1 o 2 3 3 1 2 3 1 2 3 1 2 3 c
3	*S*	[lesson 1] 1 [lesson 2] 1 1 2 3 1 2 3 1 2 3 1 2 d 2 d 3 d c 3 1 2 3 1 2 3 2 3 d 2 1 3 1 1 3 1 3 1 3 1 3 1 2 3 3 1 2 1 2 d 3 3 1 2 1 2 3 d 3 2 1 1 1 1 1 3 3 3 3 [lesson 3] o 1 2 3 2 3 3 d 1 1 2 3 1 2 3 1 2 3 1 3 2 1 2 3 1 2 3 1 2 3 [lesson 1] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c 1 2 3 1 2 3 1 2 3 o 1 d 3 1 2 3 3 1 2 3 1 2 3 1 2 d 3
4	*S*	[lesson 1] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 o 1 3 1 2 1 2 3 3 1 2 3 1 2 3 1 2 3 1 3 [lesson 2] 1 2 3 d 1 2 3 1 2 3 d 1 2 3 d 1 2 3 1 2 3 1 3 1 3 1 3 1 3 o [lesson 3] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3
5	*S*	[lesson 1] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 2 2 1 2 3 1 2 3 1 2 3 1 3 1 3 1 2 3 3 1 2 3 1 2 1 3 2 1 2 3 [lesson 2] 1 2 3 1 2 d 3 1 2 3 1 2 3 2 3 1 1 2 3 1 1 1 1 3 3 3 [lesson 3] o 1 2 1 1 1 1 1 2 3 1 2 3 1 2 3 3 2 1 3 3 2 1 2 3 1 2 3 2 3 3 1 2 1 2 3 1 2 3 1 1 2 3 2 1 3
7	*S*	[lesson 1] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c 1 2 3 1 2 3 1 2 3 1 3 1 2 3 3 1 2 3 1 2 3 1 2 3 [lesson 3] 1 2 3 1 2 d 3 1 2 d 3 1 2 3 1 2 d 3 1 2 d 3 1 2 3 d 3 o 1 2 d o 1 2 d 3 1 2 d 3 o 1 d 3 1 2 d 3 1 2 d 3 1 2 d 3 o [lesson 2] o 1 2 d 3 d 2 3 1 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 o 1 o 1 3 3 1 3 1 3 c 1 2 d [lesson 3] o 1 2 d 3 d 2 o o 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3
8	*S*	[lesson 1] 1 1 2 3 1 2 3 1 3 2 2 1 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 3 3 3 3 2 1 2 3 1 3 1 2 3 3 3 3 1 2 3 1 2 3 1 2 3 [lesson 2] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 3 1 3 1 3 1 3 [lesson 3] 1 2 3 1 2 3 1 2 3 1 2 3 2 3 1 2 1 3 1 2 3 1 2 3 1 2 3
10	*S*	[lesson 1] 1 2 3 1 2 3 3 2 1 1 2 3 3 3 2 2 1 1 1 2 3 1 2 3 1 2 3 1 3 1 2 3 3 1 2 3 1 2 3 1 2 3 [lesson 2] 1 1 3 3 2 1 2 3 1 2 3 1 2 3 1 2 3 1 1 3 1 3 1 3 [lesson 3] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3
11	*S*	Lesson 3] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 2 1 2 2 2 2 3 1 2 3 1 2 3 1 2 3 1 2 1 2 3 1 3 1 3 1 2 3 3 1 2 3 1 2 d 3 1 2 1 2 d 3 d [lesson 2] 1 2 3 1 2 d 3 d 1 2 d 3 1 2 d 3 1 2 d 3 1 2 3 1 3 1 3 1 3 1 3 1 3 1 3 3 [lesson 3] o 1 3 3 1 2 3 d 1 d 3 1 o 1 2 d 3 1 2 d 3 1 2 d 3 1 2 3 1 2 3
14	*S*	[lesson 1] o 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c 1 1 2 1 2 d 3 1 2 d 1 2 3 1 2 3 1 1 d 3 1 2 3 3 1 2 1 2 3 1 2 3 1 2 1 2 d 3 [lesson 2] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 3 1 3 1 3 [lesson 3] o 1 2 1 2 d 3 o 2 1 1 o 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3
15	*S*	[lesson 1] 1 o 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c o 1 2 3 1 2 3 1 2 3 c 1 d 3 1 o 2 3 3 1 2 3 1 2 3 1 d 2 3 d 1 2 d 1 2 d c d 3 [lesson 2] o 1 2 d 3 1 2 1 2 d 3 d d 3 d 3 d 1 3 1 2 1 o 1 2 3 1 2 d 3 d 3 o 1 1 1 1 2 2 3 3 d d 1 2 d 3 d 2 3 2 3 2 3 1 2 d 3 1 2 d 3 1 2 d 3 d c o o 1 3 1 3 1 3 1 3 1 3 [lesson 3] o o 1 2 d 2 d 3 2 d 3 2 d 3 o 1 2 d 1 2 d 3 o o o o 1 2 d 3 d 3 o 1 2 d 3 d 1 2 d 3 d o o 1 2 d 3 o 1 2 d 1 2 d 3 d o 1 2 d 3 o o 1 2 d 3 1 2 o 1 d 2 d 3 1 2 d 3 2 2 2 2 2 d 3 1 2 d 2 d 3 1 2 1 2 d 3 1 2 d 3 2
16	*S*	[lesson 1] o 1 2 1 2 3 2 3 1 2 1 2 3 3 1 2 3 1 2 3 1 2 3 1 2 3 o 1 2 3 1 2 3 1 2 1 3 1 3 o 1 3 1 2 3 3 1 2 3 1 2 3 1 2 d 3 d 3 [lesson 2] 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 2 3 d 1 2 d 3 1 1 1 1 3 3 3 3 [lesson 3] o 1 2 3 1 2 d 3 1 2 3 o 1 2 d 3 1 2 1 3 1 2 3 1 2 3 o
29	*S*	[lesson 1] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c 1 2 3 1 2 3 1 2 3 c 1 d 3 1 2 3 3 1 2 3 1 2 3 1 2 3 c [lesson 3] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 [lesson 2] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 3 1 3
30	*S*	[lesson 1] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 2 3 3 1 2 3 1 2 3 1 2 3 [lesson 2] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 3 1 3 1 3 [lesson 3] o 1 2 3 1 2 d 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3
33	*S*	[lesson 1] o 1 1 1 1 1 1 2 2 2 2 2 2 3 3 3 3 3 3 c c 1 1 1 2 2 2 3 3 3 c 1 3 d 1 o 1 1 1 2 2 2 2 3 3 3 3 3 c [lesson 3] 1 2 o d o 3 o 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 d 2 d 3 [lesson 2] o 1 d 2 d 3 1 2 d 3 1 2 3 1 2 3 1 2 3 1 2 3 1 1 3 3 3 3 1
35	*S*	[lesson 3] 1 2 3 1 1 1 1 1 1 2 2 2 2 2 2 3 3 3 3 3 3 [lesson 2] 1 1 1 1 1 1 2 2 2 2 2 2 3 3 3 d 3 3 3 1 3 1 3 1 3 1 3
36	*S*	[lesson 1] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 2 2 1 3 1 3 1 1 2 3 3 1 2 3 1 2 3 1 2 3 [lesson 2] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 3 1 3 1 3 [lesson 3] 1 3 2 3 3 2 1 o o 3 2 1 3 2 1 3 2 3 1 2 3 1 3 2 1 3 2 1
37	*S*	[lesson 2] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 3 3 3 [lesson 1] 1 2 3 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c 3 c 1 2 3 1 3 2 3 1 3 1 2 3 3 1 3 1 2 3 1 3 [lesson 3] 1 2 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3

ID	LS	Tracking Patterns
39	S	[lesson 1] 1 1 1 1 1 1 2 1 3 2 3 2 3 2 3 2 3 2 3 c 1 2 3 1 2 3 1 2 3 1 3 d 1 2 3 3 1 2 3 1 2 3 1 2 3 1 1 2 3 [lesson 3] o o 1 2 d 3 1 1 1 1 1 2 d 3 1 2 d 3 1 2 d 3 1 2 3 1 2 d 3 1 2 3 [lesson 2] 1 2 3 3 2 1 1 2 3 3 2 1 1 2 3 3 2 1 1 1 1 1 3 3 3 3 3 1 3 1 3 3 3 1 2 1
40	S	[lesson 1] 1 2 3 1 2 3 o 1 2 3 1 2 3 o 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c o 1 2 3 1 2 3 1 2 3 c 1 3 1 2 3 o 1 2 3 3 1 2 3 1 2 3 [lesson 2] o 1 2 3 1 2 2 3 2 3 1 2 3 1 3 d 3 2 d 3 1 2 d 3 1 2 d 3 c o 1 3 1 3 1 3 1 3 [lesson 3] o o 1 2 d 3 o 1 2 d 3 1 2 d 3 1 2 d 3 1 2 3 1 2 d 3 1 2 d 3
42	S	[lesson 1] 1 1 1 1 1 1 2 3 2 3 2 3 2 3 2 3 2 3 1 2 1 3 1 2 3 1 2 3 1 3 1 3 3 2 1 3 2 1 1 2 3 1 2 3 [lesson 2] 1 2 3 1 1 2 3 2 3 1 2 3 1 2 3 1 2 3 1 1 1 1 3 3 3 3 [lesson 3] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3
43	S	[lesson 1] 1 1 1 1 1 1 2 2 2 2 2 2 3 3 3 3 3 3 1 1 1 2 2 2 3 3 3 c 2 2 o c 3 1 1 1 1 1 2 2 2 3 3 2 3 3 3 3 3 3 [lesson 2] o 1 1 1 1 o 1 1 2 2 2 2 2 2 1 1 1 1 1 1 2 2 2 2 2 2 d 3 3 3 3 3 3 1 1 1 1 3 3 3 3 [lesson 3] 1 2 3 1 3 2 3 1 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3
44	S	[lesson 1] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 d 3 c 1 2 3 1 3 1 2 3 3 1 2 3 1 2 3 1 2 d 3 d c [lesson 2] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 1 1 1 3 3 3 3 [lesson 3] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3
46	S	[lesson 2] 1 2 3 1 2 3 1 2 3 1 2 1 2 1 2 3 1 2 3 1 2 3 1 3 1 3 1 3 1 3 [lesson 3] 1 2 3 1 2 3 1 2 3 1 3 2 3 1 2 d 3 1 3 2 1 2 3 [lesson 1] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 2 3 3 o 1 2 1 2 3 1 2 3
47	S	[lesson 2] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 3 1 3 1 3 [lesson 3] o o 1 2 d 3 o o 1 2 d 3 1 2 1 2 d 3 1 2 d 3 1
54	S	[lesson 2] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 [lesson 3] 1 2 3 1 2 3 1 2 1 2 d 3 1 2 d 3 1 2 d 3 1 2 3 1 2 3 [lesson 1] o 1 2 3 1 2 3 2 1 2 3 1 2 3 1 2 3 1 2 3 c o 1 2 d 3 1 2 d 3 c 1 2 d 3 o 1 d 3 1 2 3 3 1 2 3 c 1 2 d 3 1 2 d 3
58	S	[lesson 3] o 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 o o 1 2 3 d o 1 2 d 3 1 2 d 3 o 1 2 d 3 o 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 [lesson 2] o o 1 1 1 1 1 1 1 1 1 1 2 2 2 2 d 2 2 d d d d d d 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 [lesson 1] o 1 2 3 1 2 3 o 1 1 3 2 2 3 1 2 3 1 2 3 c o 1 1 2 2 2 d d d 3 3 3 c o 1 d 3 2 1 3 3 1 2 3 1 2 d 3 1 2 d 3 c
59	S	[lesson 3] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 [lesson 1] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c o 1 3 1 2 d 3 1 2 d 3 c 1 d 3 1 2 3 3 1 2 3 1 2 d 3 1 2 d 3 c [lesson 2] o 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 d 3 c o 1 3 3 1 3 1 3
60	S	[lesson 2] 1 2 d 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 3 1 3 1 3 [lesson 3] o 1 2 3 2 d 3 1 1 1 1 1 1 2 2 2 2 2 2 2 3 3 3 3 3 3 [lesson 1] 1 1 1 1 1 1 2 2 2 2 2 2 3 3 3 3 3 3 1 1 1 2 2 2 3 3 3 1 1 3 3 1 1 2 2 2 2 2 3 3 3 3
62	S	[lesson 3] o o 1 2 3 1 2 3 1 2 3 1 1 2 3 2 3 1 2 3 1 2 3 [lesson 2] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 3 1 3 1 3 [lesson 1] 1 2 3 1 2 3 1 3 1 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 2 3 3 1 2 3 1 2 3 1 3 1 2 3
63	S	[lesson 1] 3 3 3 3 3 2 2 2 2 1 1 1 1 1 1 2 o o 1 1 1 2 2 2 3 3 3 1 d 3 1 2 3 3 3 1 2 2 3 2 1 [lesson 2] 3 3 1 1 3 3 1 3 3 1 1 3 [lesson 3] 3 2 1 1 2 1 2 3 1 2 3 1 2 3 2 1 1 d 3 o 1 2 3 d 3 2 1 3 2 1 3 2 1 3 2 o o 1 1 2 2 2 1 1 2 3 3 2 1 1 2 3
64	S	[lesson 2] o 1 2 3 1 2 3 1 2 d 3 1 2 3 1 2 3 1 2 3 1 3 1 1 3 3 1 3 [lesson 3] o 1 2 3 o 1 2 3 1 2 d 3 1 2 3 1 2 1 2 3 1 2 d 3 1 2 3 [lesson 1] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c 1 2 3 1 2 3 1 2 3 1 3 1 2 3 3 1 2 3 1 2 3 1 2 3
67	S	[lesson 3] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 [lesson 2] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 3 1 3 1 3 [lesson 1] 1 1 1 1 o 1 1 2 2 2 2 2 2 3 3 3 3 3 3 c 1 1 1 2 2 2 3 3 3 1 1 1 1 1 1 2 2 2 2 2 3 3 3 3 3 3
6	V	[lesson 1] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 d 1 3 1 2 3 1 3 3 1 3 1 2 3 3 1 2 3 1 2 3 1 2 d [lesson 2] 1 2 3 1 2 3 1 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 3 1 3 1 3 [lesson 3] 1 2 3 3 3 3 3 3 3 2 2 2 2 2 2 1 1 1 1 1 1 1 d 1 3 3 2 1 1 2
13	V	[lesson 1] 1 1 1 1 1 1 2 3 2 3 2 3 2 3 2 3 2 3 1 2 3 1 2 3 1 2 3 1 3 1 2 3 2 3 3 1 2 3 1 2 3 1 d 2 3 [lesson 2] 1 1 1 1 1 1 2 3 2 3 2 3 2 3 2 3 2 3 1 1 1 1 1 3 3 3 3 [lesson 3] 1 2 d 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3
17	V	[lesson 1] 1 2 1 2 3 3 1 2 3 1 2 3 1 2 3 1 2 3 o 1 2 3 1 2 3 1 2 3 o 1 2 3 3 1 3 1 2 3 1 2 3 1 2 3 1 2 1 2 2 3 3 1 1 2 2 3 3 1 1 2 2 3 c o o 1 2 3 1 2 3 1 2 3 c 1 3 o 1 2 3 1 2 3 1 2 3 1 2 d d c [lesson 2] 1 2 3 d 1 2 3 d 1 2 3 d 1 2 3 d 1 2 3 d 1 2 3 d o c 1 3 1 3 1 3 1 3 3 3 3 3 [lesson 3] o 1 2 d 3 o o 1 2 3 d 1 2 d 3 1 2 d 3 1 2 3 d 1 2 d 3 1 2 d 3 o o 1 d 3 o 1 1 1 1 1 1 2 2 2 2 2 2 3 d d 3 d 3 d 3 d 3 d 3 o
26	V	[lesson 1] o 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 c 1 d 3 1 2 3 3 1 2 3 1 2 3 1 2 3 [lesson 2] o 1 2 3 1 2 3 1 2 d 1 3 1 2 d 3 1 2 d 3 1 2 3 c o 1 3 1 3 1 3 1 3 [lesson 3] o 1 2 d 2 d 3 o 1 2 d 3 1 2 d 3 1 2 d 3 1 2 3 d 1 2 d 3 1 2 d 3
34	V	[lesson 1] 3 2 1 3 2 1 3 2 1 3 2 1 3 2 1 3 2 1 3 2 1 2 3 1 2 3 1 3 2 1 3 1 2 3 2 1 3 2 1 3 2 1 3 2 1 3 1 3 1 3 3 2 1 3 2 1 3 2 1 3 2 1 1 2 3 3 2 1 1 2 3 3 2 1 1 2 3 3 2 1 3 2 1 3 2 1 3 2 1 3 1 3 2 1 3 3 2 1 3 2 1 2 3 2 1 [lesson 2] 3 2 1 3 2 1 1 2 1 1 2 3 1 2 3 1 2 3 1 2 3 1 1 2 3 1 2 3 1 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 1 2 3 1 2 d 3 1 2 d 3 1 c 1 3 1 3 1 3 1 3 1 3 3 3 3 3 3 3 1 3 [lesson 3] o 1 2 3 1 o 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3
41	V	[lesson 1] 1 1 1 1 1 1 o 2 3 2 3 2 3 2 3 2 3 2 3 c 1 2 d 3 1 2 3 1 2 d 3 o 1 d 3 1 2 3 3 1 2 3 1 2 3 1 2 3 [lesson 2] 1 2 d 3 o 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 2 d 3 1 3 1 3 1 3 1 3 [lesson 3] o o 1 2 d 3 1 2 d 3 1 2 d 3 1 2 3 1 2 d 3 1 2 3 1 2 3
51	V	[lesson 1] 1 1 1 1 1 1 2 3 2 2 2 2 3 3 3 3 3 2 c 1 1 1 2 2 2 3 3 3 c 1 1 1 1 1 2 2 2 2 3 3 3 3 c 3 3 1 2 3 3 3 1 3 d 1 d 3 1 2 3 2 3 1 3 1 2 3 3 1 2 1 2 3 3 1 2 3 3 1 [lesson 2] 1 2 3 1 2 3 2 3 1 [lesson 3] o o 1 2 3 1 1 o 1 2 3 1 2 3 1 1 1 1 2 3 2 3 2 3 2 3 o 1 2 2 3 3 3 3 3 3 2 2 2 2 2 1 1 1 1 1
57	V	[lesson 3] 1 2 3 1 1 1 1 1 1 2 2 2 2 2 2 3 3 3 3 3 3 3 3 d 3 2 2 2 2 2 1 1 1 1 1 1 3 2 1 [lesson 2] 1 1 1 1 1 1 2 2 2 2 2 2 3 3 3 3 3 3 3 1 1 1 1 1 3 3 3 3 [lesson 1] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 2 3 3 1 2 3 1 2 1 2 3

As described in Chapter 5, this mechanism extracted the features from each tracking pattern for each lesson by building nine arrays with a total of 336 values, as illustrated in Appendix C.

6.2.2 The Questions Mechanism's Results

There were 67 participants in this study. Only 63 of them finished the third online lesson that has the nine questions. The questions appear after clicking on specific learning objects in the lesson map. As a result, not all of the 63 participants answered all of the nine questions because not all of the participants clicked on all of the learning objects. The responses of the 63 participants to these nine questions are shown in Table 14, including the score results from the Study Preference Questionnaire. In this table, the symbol '-' was added to the answers of some participants on some questions to indicate that these participants did not answer these questions.

Table 14.

The Participants' Responses to the Nine Questions in the Third Online Lesson

ID	Learning Style	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	Q7	Q8	Q9
1	*H*	1	2	1	2	2	2	1	3	2
9	*H*	2	1	-	6	1	3	3	4	2
12	*H*	2	1	-	6	2	3	1	4	2
18	*H*	1	2	-	4	1	2	3	4	2
19	*H*	2	2	-	1	1	3	2	4	4
20	*H*	2	2	-	5	2	1	3	4	2
21	*H*	-	-	1	5	2	2	2	4	2
22	*H*	2	1	-	4	2	1	1	2	4
23	*H*	2	2	1	6	1	3	1	4	1
24	*H*	-	-	-	-	-	-	-	-	-
25	*H*	2	2	1	2	1	2	2	3	1
27	*H*	-	-	-	-	-	-	-	-	-
28	*H*	2	2	-	5	2	1	1	4	4
31	*H*	2	1	1	6	1	3	3	4	2
32	*H*	2	2	1	2	2	3	1	4	2
38	*H*	1	2	1	5	1	2	2	1	1
45	*H*	2	2	-	5	1	3	3	4	2
48	*H*	2	2	1	6	2	3	2	2	2
49	*H*	-	-	-	-	-	-	-	-	-
50	*H*	2	2	1	4	2	3	2	4	2
52	*H*	1	2	1	3	2	3	2	4	2
53	*H*	-	-	-	-	-	-	-	-	-
55	*H*	2	2	1	5	2	3	3	4	2
56	*H*	2	2	1	2	2	1	2	4	2
61	*H*	1	2	1	2	1	3	2	4	2
65	*H*	2	1	1	4	2	1	3	2	2
66	*H*	1	2	1	3	2	1	1	3	1
2	*S*	2	2	1	6	1	3	1	4	2
3	*S*	2	2	-	4	2	2	1	4	2
4	*S*	2	2	-	5	1	3	3	3	2
5	*S*	1	2	-	6	1	3	3	3	1
7	*S*	1	2	1	5	2	2	1	4	2
8	*S*	2	2	-	5	2	3	3	1	2
10	*S*	2	2	-	6	2	3	1	4	2
11	*S*	2	2	-	5	2	3	2	4	2
14	*S*	1	2	1	4	2	2	1	2	2
15	*S*	1	2	1	5	2	3	1	4	2
16	*S*	2	2	-	2	2	3	2	4	2
29	*S*	1	2	-	4	1	3	1	3	1
30	*S*	2	2	-	3	2	2	1	4	2
33	*S*	2	2	1	2	1	3	3	4	2
35	*S*	2	1	-	2	1	3	2	1	2
36	*S*	2	2	-	3	2	3	2	4	2
37	*S*	1	2	-	4	1	3	3	4	2
39	*S*	1	2	1	3	2	2	3	1	2
40	*S*	1	1	1	2	2	3	2	4	1
42	*S*	2	2	-	2	3	1	3	3	2
43	*S*	2	1	-	5	2	3	2	4	3
44	*S*	2	2	-	4	1	3	1	4	2
46	*S*	2	2	-	3	2	3	2	4	2
47	*S*	1	1	2	2	2	-	-	-	-
54	*S*	2	2	-	5	1	2	2	4	2
58	*S*	1	2	1	6	1	3	2	4	4
59	*S*	2	1	-	4	2	1	3	2	1
60	*S*	1	2	1	5	2	3	1	4	1
62	*S*	1	2	-	5	2	3	1	3	2
63	*S*	2	2	-	5	2	3	-	2	2
64	*S*	1	2	-	5	2	2	3	1	1
67	*S*	2	2	-	5	2	3	1	1	2
6	*V*	2	2	-	6	1	3	3	4	4
13	*V*	2	1	1	2	2	3	2	1	1
17	*V*	2	2	1	5	2	3	1	4	2
26	*V*	2	2	2	3	2	3	2	1	2
34	*V*	1	2	-	5	1	3	2	4	1
41	*V*	1	2	2	4	2	3	2	4	1
51	*V*	2	2	-	5	2	3	2	4	3
57	*V*	2	2	-	1	2	1	3	4	2

This mechanism used the answers of these nine questions as features. The values of these features contain one of the following values only {1, 2, 3, 4, 5, 6}, unlike the extracted features from the Tracking Patterns. The results show that only 29 participants answered Question #3 because this question was linked to an optional learner object and not required, and only Question #4 and Question #5 have been answered by all of 63 participants. While 61 participants answered on Question #7, 62 participants answered on Questions #1, Questions #2, Questions #6, and Questions #8. Table 15 concludes the number of participants, according to their learning styles, who answered each of the nine questions categorized by their answers.

Table 15.

The Number of Participants Who Answered Each of the Nine Questions and the Number of Participants, According to Their Learning Styles, Who Chose Each Answer of each of these Questions

Question ID	Number of Participants Answer this Question	Answers ID	Number of Participants Choose this Answer			
			Total	Only Holist learner	Only Serialist learner	Only Versatile learner
Q_1	62	**1**	21	6	13	2
		2	41	16	19	6
Q_2	62	**1**	11	5	5	0
		2	51	17	27	7
Q_3	29	**1**	26	15	9	2
		2	3	0	1	2
Q_4	63	**1**	2	1	0	1
		2	12	5	6	1
		3	7	2	4	1
		4	11	4	6	1
		5	21	6	12	3
		6	10	5	4	1
Q_5	63	**1**	21	9	10	2
		2	41	14	21	6
Q_6	62	**1**	9	6	2	1
		2	12	5	7	0
		3	41	12	22	7
Q_7	61	**1**	20	7	12	1
		2	23	9	9	5
		3	18	7	9	2
Q_8	62	**1**	8	1	5	2
		2	6	3	3	0
		3	8	3	5	0
		4	40	16	18	6
Q_9	62	**1**	13	4	6	3
		2	42	16	23	3
		3	2	0	1	1
		4	5	3	1	1

6.3 The 13 Classifiers' Results

The classifying phase that was conducted in this research used v-fold technique for validation. At the beginning, the participants in each lesson were randomly distributed in different groups, such that each group would have appropriately the same number of students in each leaning style. They are eight versatile learners in the first online lesson as well in as third online lesson, and seven versatile learners in the second online lesson. Therefore, the versatile learners in each lesson were distributed to 8 groups in the first and last lessons and to 7 groups in the second lesson. The other participants were distributed randomly to these groups based on their learning styles.

The following three sections represent the classifying process's results on each online lesson. It starts with distribution of the participants in groups, and then it compares the 13 classifiers' results compared to the Study Preference Questionnaire's result.

6.3.1 The First Online Lesson

There were 64 participants in this lesson. Twenty-six of them were holist learners; 30 were serialist learners; and only eight were versatile learners. Therefore, they were divided into eight groups. The distribution of these participants is shown in Figure 44.

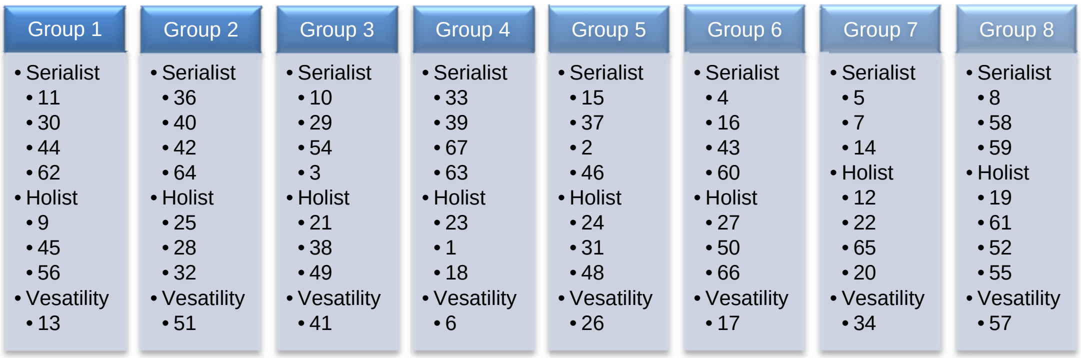

Figure 44.

The distribution of the first-online-lesson participants into groups

Each of the eight groups has been held off once, and the others were used for training each of the 13 classifiers. Each group held off was used to validate the classifiers. The results of these classifiers were one of the three values {Serialist, Holist, or Versatile}. Table 16 reports the result of testing each of these participants on the 13 classifiers, including their score result from the Study Preference Questionnaire.

Table 16.

The Reports of the 13 Classifiers for the First Online Lesson

ID	Questionnaire	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}
1	*H*	S	H	H	S	H	S	H	H	S	H	H	H	H
9	*H*	H	H	S	S	S	H	H	H	H	H	S	H	H
12	*H*	S	S	H	S	S	S	S	H	H	H	V	S	S
18	*H*	V	V	H	S	S	S	V	H	V	H	H	H	H
19	*H*	S	S	S	S	S	S	S	H	H	S	S	S	S
20	*H*	S	S	S	S	S	S	S	V	S	H	S	S	S
21	*H*	H	H	H	S	S	H	S	S	H	H	H	S	H
22	*H*	S	S	S	S	H	S	S	H	S	H	S	S	S
23	*H*	S	S	S	S	S	S	S	S	S	S	S	H	H
24	*H*	H	H	H	S	S	S	H	H	H	H	H	H	H
25	*H*	S	H	S	S	S	S	V	H	S	H	V	H	S
27	*H*	H	H	H	S	S	S	S	H	H	H	V	H	H
28	*H*	V	S	S	S	S	S	H	S	H	H	H	H	H
31	*H*	H	H	H	S	S	S	H	H	S	H	V	S	H
32	*H*	H	H	S	S	S	H	H	S	S	H	H	H	V
38	*H*	H	H	S	S	S	S	V	V	V	H	H	S	H
45	*H*	V	S	S	S	S	H	S	H	H	H	S	S	V
48	*H*	H	S	H	S	S	S	H	H	H	H	S	S	S
49	*H*	H	H	H	S	S	H	H	S	H	H	S	S	S
50	*H*	H	H	H	S	S	H	S	H	H	H	S	H	H
52	*H*	S	S	H	S	S	S	H	H	V	H	H	S	S
53	*H*	-	-	-	-	-	-	-	-	-	-	-	-	-
55	*H*	H	S	H	S	S	H	H	H	H	H	H	S	S
56	*H*	S	S	H	S	S	H	V	H	S	H	S	S	H
61	*H*	H	H	H	H	S	H	H	H	H	H	H	H	S
65	*H*	H	H	H	H	S	S	H	H	H	H	V	H	S
66	*H*	H	S	S	S	S	S	V	H	S	H	S	H	S
2	*S*	H	S	S	S	S	S	S	S	S	H	S	H	H
3	*S*	H	S	S	S	S	S	H	H	V	H	H	H	S
4	*S*	S	S	S	S	H	S	S	V	S	V	S	S	V
5	*S*	S	S	S	S	H	S	S	H	S	S	S	H	S
7	*S*	S	S	S	S	H	S	S	H	S	H	S	S	S
8	*S*	H	S	S	S	S	S	V	H	V	V	H	S	V
10	*S*	H	H	S	S	S	S	H	H	H	H	H	S	H
11	*S*	H	H	H	S	S	H	V	H	H	V	H	S	S
14	*S*	S	H	H	S	H	S	S	H	S	H	H	H	H
15	*S*	H	H	H	S	S	S	S	S	S	H	S	V	H
16	*S*	H	H	S	S	S	S	S	H	H	H	H	S	V
29	*S*	S	S	H	S	S	S	S	S	S	H	H	H	S
30	*S*	S	S	H	S	S	H	S	H	V	H	S	S	H
33	*S*	H	H	H	H	H	H	H	S	V	H	H	S	S
35	*S*	-	-	-	-	-	-	-	-	-	-	-	-	-
36	*S*	S	S	S	S	H	H	V	S	S	V	S	S	S
37	*S*	S	S	H	H	S	S	S	S	V	H	S	S	H
39	*S*	H	H	H	H	H	H	H	H	H	H	S	H	H
40	*S*	H	S	S	S	H	H	V	H	S	H	V	S	S
42	*S*	S	V	S	S	S	S	V	H	S	H	H	H	S
43	*S*	S	H	H	S	S	H	S	H	S	H	V	S	H
44	*S*	S	S	H	S	S	H	H	H	S	H	S	S	S
46	*S*	S	S	S	S	S	S	S	S	S	S	S	S	S
47	*S*	-	-	-	-	-	-	-	-	-	-	-	-	-
54	*S*	H	H	H	H	S	H	H	H	H	H	H	H	S
58	*S*	H	H	H	S	S	H	H	H	V	H	H	V	S
59	*S*	H	H	H	H	S	H	H	H	S	H	H	S	S
60	*S*	H	S	H	S	S	S	S	H	S	H	S	S	H
62	*S*	S	S	H	H	H	H	S	H	S	V	S	S	S
63	*S*	H	H	H	H	H	H	H	S	H	H	H	V	S
64	*S*	S	S	S	S	H	H	S	H	S	H	H	S	S
67	*S*	S	S	H	H	H	H	S	S	S	H	S	S	H
6	*V*	H	S	S	S	S	S	V	S	S	H	S	V	S
13	*V*	H	S	S	S	S	H	V	H	S	V	S	S	S
17	*V*	H	H	S	S	S	S	S	H	H	H	H	H	H
26	*V*	S	S	S	S	S	S	S	H	H	H	S	H	H
34	*V*	H	S	H	H	H	S	H	H	S	H	V	H	S
41	*V*	H	H	H	S	S	S	H	V	H	H	H	S	H
51	*V*	H	H	S	S	S	S	H	S	S	H	S	S	V
57	*V*	H	S	S	S	S	H	S	S	S	S	S	S	S

C1, C2, …. and C13 (see Table 11)

The confusion matrix for each of the 13 classifiers was generated to conclude the results of these classifiers. The thirteen confusion matrixes are shown in Table 17.

Table 17.

The Confusion Matrixes of the Thirteen Classifiers in the First Online Lesson

C_1: Single Tree

	Predicted		
Actual	H	S	V
H	14	9	3
S	15	15	0
V	7	1	0

C_2: TreeBoost

	Predicted		
Actual	H	S	V
H	13	12	1
S	12	17	1
V	3	5	0

C_3: SVM

	Predicted		
Actual	H	S	V
H	15	11	0
S	17	13	0
V	2	6	0

C_4: SVM

	Predicted		
Actual	H	S	V
H	2	24	0
S	8	22	0
V	1	7	0

C_5: SVM

	Predicted		
Actual	H	S	V
H	2	24	0
S	12	18	0
V	1	7	0

C_6: SVM

	Predicted		
Actual	H	S	V
H	9	17	0
S	15	15	0
V	2	6	0

C_7: Discriminant A.

	Predicted		
Actual	H	S	V
H	12	9	5
S	9	16	5
V	3	3	2

C_8: MLFN

	Predicted		
Actual	H	S	V
H	19	5	2
S	20	9	1
V	4	3	1

C_9: MLFN

	Predicted		
Actual	H	S	V
H	14	9	3
S	6	18	6
V	3	5	0

C_{10}: MLFN

	Predicted		
Actual	H	S	V
H	24	2	0
S	23	2	5
V	6	1	1

C_{11}: MLFN

	Predicted		
Actual	H	S	V
H	10	11	5
S	14	14	2
V	2	5	1

C_{12}: MLFN

	Predicted		
Actual	H	S	V
H	13	13	0
S	8	19	3
V	3	4	1

C_{13}: MLFN

	Predicted		
Actual	H	S	V
H	12	12	2
S	10	17	3
V	3	4	1

C1, C2, …. and C13 (see Table 11)

6.3.2 The Second Online Lesson

There were 65 participants in this lesson. Twenty-four of them were holist learners, 32 were serialist learners, and only seven were versatile learners. Therefore, they were divided into seven groups. The distribution of these participants is shown in *Figure 45*, including the participant IDs.

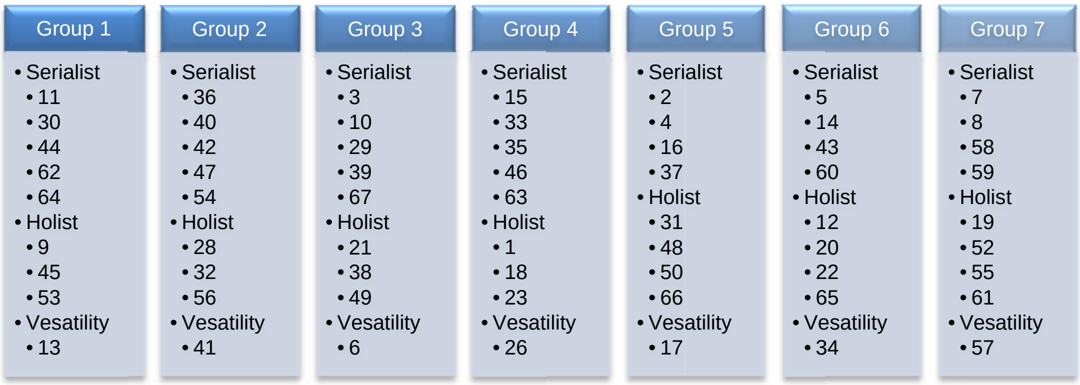

Figure 45.

The distribution of the second-online-lesson participants into groups

Each of the seven groups was held off once, and the others were used for training each of the 13 classifiers. Each group held off was used to validate the classifiers. The results of these classifiers were one of the three values {Serialist, Holist, or Versatile}. Table 18 reports the result of testing each of these participants on the 13 classifiers, including their score result from the Study Preference Questionnaire.

Table 18.

The Reports of the 13 Classifiers for the Second Online Lesson

ID	Questionnaire	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}
1	***H***	S	S	H	H	H	H	S	H	S	H	S	H	H
9	***H***	H	S	H	H	H	H	H	S	S	H	S	S	S
12	***H***	S	S	S	S	S	S	S	H	V	H	H	S	S
18	***H***	H	H	S	S	S	S	H	H	H	H	S	S	H
19	***H***	V	V	S	S	S	S	V	S	S	H	S	S	S
20	***H***	H	S	S	S	S	S	H	S	S	H	S	S	S
21	***H***	H	S	H	H	S	H	S	V	S	H	S	S	H
22	***H***	V	H	S	S	S	S	H	H	H	V	S	H	S
23	***H***	H	V	H	S	S	S	V	H	H	H	H	H	H
24	***H***	-	-	-	-	-	-	-	-	-	-	-	-	-
25	***H***	-	-	-	-	-	-	-	-	-	-	-	-	-
27	***H***	-	-	-	-	-	-	-	-	-	-	-	-	-
28	***H***	H	S	S	S	S	S	V	H	S	H	H	H	S
31	***H***	H	H	S	S	S	S	H	S	H	H	H	S	H
32	***H***	S	S	H	S	S	H	H	H	S	H	H	H	S
38	***H***	S	S	H	H	H	H	S	H	S	H	H	H	H
45	***H***	V	S	H	H	H	H	H	S	S	S	S	H	S
48	***H***	V	S	H	S	S	S	V	S	V	S	S	S	S
49	***H***	H	S	H	S	S	S	S	V	S	H	S	H	S
50	***H***	S	V	S	S	S	S	V	V	H	H	S	S	S
52	***H***	H	S	S	S	S	S	S	H	H	H	S	S	S
53	***H***	S	S	H	S	H	H	V	S	S	H	S	S	H
55	***H***	H	S	S	S	S	S	S	H	S	V	V	S	S
56	***H***	S	S	S	S	S	S	V	H	S	S	H	H	S
61	***H***	H	S	S	S	S	S	H	H	H	H	S	S	S
65	***H***	H	S	H	S	S	S	S	S	S	H	S	S	S
66	***H***	S	H	S	H	S	H	S	S	H	H	H	H	S
2	***S***	H	H	S	S	S	S	V	V	H	H	S	S	S
3	***S***	H	H	S	S	S	S	S	H	H	V	S	H	S
4	***S***	H	H	S	S	S	S	S	S	H	H	H	H	H
5	***S***	S	S	S	S	S	S	H	H	H	H	S	H	S
7	***S***	H	H	S	S	S	S	S	H	H	H	H	S	H
8	***S***	V	S	S	S	S	S	S	S	S	H	V	S	S
10	***S***	H	H	S	S	S	S	H	H	S	S	H	H	H
11	***S***	S	S	S	S	S	S	S	S	S	S	S	H	S
14	***S***	S	S	H	S	V	H	S	S	S	V	S	S	S
15	***S***	H	H	H	V	S	V	V	H	H	H	H	H	H
16	***S***	H	H	S	S	S	S	H	H	H	H	S	S	S
29	***S***	S	S	H	H	H	H	S	V	S	V	S	S	S
30	***S***	S	S	H	H	S	H	S	S	S	H	S	S	H
33	***S***	S	S	H	S	H	S	S	H	S	H	S	H	H
35	***S***	H	H	S	S	H	S	H	V	H	H	S	H	S
36	***S***	S	S	H	S	S	S	S	H	S	H	S	S	S
37	***S***	S	S	H	S	S	H	H	H	S	H	S	S	S
39	***S***	H	H	S	S	S	S	S	H	H	S	H	H	S
40	***S***	H	H	S	S	S	S	H	H	V	H	H	H	H
42	***S***	S	S	S	S	S	S	V	H	S	V	H	H	S
43	***S***	H	H	H	S	V	S	S	H	S	H	S	H	H
44	***S***	S	S	H	H	S	H	S	H	H	H	H	S	S
46	***S***	H	H	S	S	S	S	H	H	H	H	H	S	S
47	***S***	S	S	H	S	H	H	V	S	S	S	S	S	S
54	***S***	H	H	S	S	S	S	H	H	H	S	S	S	S
58	***S***	H	H	S	S	H	S	V	H	H	H	S	S	H
59	***S***	H	H	S	S	S	S	S	H	H	H	S	S	S
60	***S***	S	H	S	S	S	S	H	S	H	S	S	H	S
62	***S***	S	S	H	H	H	H	H	S	S	H	S	S	S
63	***S***	S	S	H	S	H	H	S	H	S	H	S	S	H
64	***S***	H	S	H	S	H	H	V	H	H	V	S	S	S
67	***S***	S	S	H	H	S	H	S	V	S	H	S	S	S
6	***V***	H	H	S	S	H	S	H	V	S	H	H	H	H
13	***V***	S	H	S	V	H	S	S	S	S	H	S	S	S
17	***V***	H	S	S	S	S	S	H	H	S	H	S	S	S
26	***V***	H	H	S	S	S	S	H	H	H	H	H	H	H
34	***V***	S	H	S	S	S	S	V	H	H	H	S	H	S
41	***V***	H	H	S	S	S	S	S	S	H	H	H	S	S
51	***V***	-	-	-	-	-	-	-	-	-	-	-	-	-
57	***V***	H	H	S	H	H	S	H	S	H	V	S	S	H

C1, C2, …. and C13 (see Table 11)

The confusion matrix for each of the 13 classifiers was generated to conclude the results of these classifiers. The thirteen confusion matrixes are shown in Table 19.

Table 19.

The Confusion Matrixes of the Thirteen Classifiers in the Second Online Lesson

C_1: Single Tree

	Predicted		
Actual	H	S	V
H	12	8	4
S	16	15	1
V	5	2	0

C_2: TreeBoost

	Predicted		
Actual	H	S	V
H	4	17	3
S	16	16	0
V	6	1	0

C_3: SVM

	Predicted		
Actual	H	S	V
H	11	13	0
S	14	18	0
V	0	7	0

C_4: SVM

	Predicted		
Actual	H	S	V
H	6	18	0
S	5	26	1
V	1	5	1

C_5: SVM

	Predicted		
Actual	H	S	V
H	5	19	0
S	8	22	2
V	3	4	0

C_6: SVM

	Predicted		
Actual	H	S	V
H	8	16	0
S	10	21	1
V	0	7	0

C_7: Discriminant A.

	Predicted		
Actual	H	S	V
H	8	9	7
S	10	16	6
V	4	2	1

C_8: MLFN

	Predicted		
Actual	H	S	V
H	12	9	3
S	20	8	4
V	3	3	1

C_9: MLFN

	Predicted		
Actual	H	S	V
H	8	14	2
S	16	15	1
V	4	3	0

C_{10}: MLFN

	Predicted		
Actual	H	S	V
H	19	3	2
S	21	6	5
V	6	0	1

C_{11}: MLFN

	Predicted		
Actual	H	S	V
H	8	15	1
S	9	22	1
V	3	4	0

C_{12}: MLFN

	Predicted		
Actual	H	S	V
H	10	14	0
S	13	19	0
V	3	4	0

C_{13}: MLFN

	Predicted		
Actual	H	S	V
H	7	17	0
S	10	22	0
V	3	4	0

C1, C2, …. and C13 (see Table 11)

6.3.3 The Third Online Lesson

There were 63 participants in this lesson. Twenty-three of them were holist learners, 32 were serialist learners, and only eight were versatile learners. Therefore, they were divided into eight groups. The distribution of these participants is shown in Figure 46, including the participant IDs.

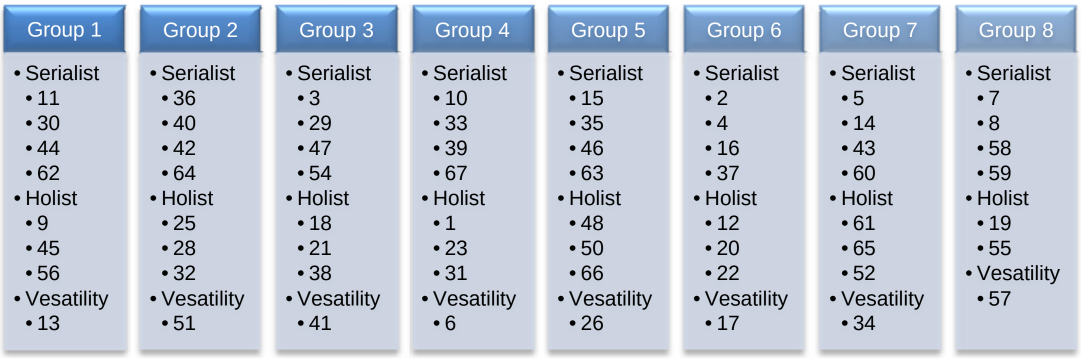

Figure 46.

The distribution of the third-online-lesson participants into groups

Each of the eight groups was held off once, and the others were used for training each of the 13 classifiers. Each group held off was used to validate the classifiers. The results of these classifiers were one of the three values {Serialist, Holist, or Versatile}. Table 20 reports the result of testing each of these participants on the 13 classifiers, including their score result from the Study Preference Questionnaire.

Table 20.

The Reports of the 13 Classifiers for the Third Online Lesson

ID	Questionnaire	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}
1	*H*	V	H	S	S	S	S	H	S	S	V	H	H	H
9	*H*	S	S	S	S	S	S	S	S	H	H	S	S	S
12	*H*	S	S	S	S	S	S	H	H	S	V	S	H	S
18	*H*	H	S	S	S	S	S	S	S	S	H	H	S	S
19	*H*	S	S	S	H	S	H	S	S	S	S	S	H	H
20	*H*	H	H	S	S	S	S	S	S	H	H	H	H	H
21	*H*	S	S	S	S	S	S	H	V	H	V	S	S	S
22	*H*	S	S	S	S	S	S	S	H	S	H	S	H	S
23	*H*	H	S	S	S	S	S	H	S	H	H	H	H	S
24	*H*	-	-	-	-	-	-	-	-	-	-	-	-	-
25	*H*	H	H	S	S	S	S	H	H	H	V	H	H	H
27	*H*	-	-	-	-	-	-	-	-	-	-	-	-	-
28	*H*	S	S	S	S	S	S	S	V	H	H	H	S	H
31	*H*	H	H	S	S	S	S	H	H	S	H	S	S	H
32	*H*	S	H	S	S	S	S	H	H	S	H	S	S	H
38	*H*	S	S	S	S	S	S	V	H	S	V	S	H	S
45	*H*	S	S	S	S	S	S	S	H	H	H	H	S	H
48	*H*	S	S	S	S	H	H	H	S	S	V	S	S	H
49	*H*	-	-	-	-	-	-	-	-	-	-	-	-	-
50	*H*	V	V	S	V	V	S	V	H	S	H	S	V	S
52	*H*	S	S	S	S	S	S	S	H	H	H	H	H	H
53	*H*	-	-	-	-	-	-	-	-	-	-	-	-	-
55	*H*	H	H	S	S	S	S	H	H	H	H	H	H	V
56	*H*	S	S	S	S	S	S	S	V	S	H	S	H	S
61	*H*	V	S	S	S	S	S	H	H	S	H	H	S	S
65	*H*	S	H	S	S	S	S	H	V	H	H	S	H	S
66	*H*	S	S	S	S	H	S	S	S	S	H	S	S	S
2	*S*	S	H	S	S	S	S	H	S	S	H	S	S	S
3	*S*	S	S	S	S	S	S	V	S	H	H	H	S	S
4	*S*	S	S	S	S	S	S	H	S	S	H	S	S	S
5	*S*	V	S	S	S	S	S	H	H	S	H	H	H	S
7	*S*	H	H	S	S	S	S	S	H	H	H	H	S	S
8	*S*	V	S	S	H	S	H	S	H	S	H	H	S	H
10	*S*	S	S	S	S	H	H	S	S	S	H	H	S	S
11	*S*	H	H	S	S	S	S	S	H	V	H	S	S	H
14	*S*	S	S	S	H	S	S	S	V	S	H	S	H	S
15	*S*	V	S	S	S	S	S	S	H	V	V	H	S	H
16	*S*	S	S	S	S	S	S	H	S	S	H	H	S	S
29	*S*	S	S	S	S	S	S	S	S	S	S	S	H	S
30	*S*	S	S	S	S	S	S	H	H	S	H	H	S	H
33	*S*	V	H	S	S	S	S	H	S	H	H	H	H	S
35	*S*	V	V	S	S	V	S	V	H	S	H	H	V	S
36	*S*	H	S	S	S	H	H	S	H	S	S	S	S	S
37	*S*	S	S	H	S	S	S	H	S	S	H	S	S	S
39	*S*	V	H	S	S	S	S	S	H	H	H	H	H	S
40	*S*	V	S	S	S	S	V	V	H	V	V	S	S	H
42	*S*	S	S	S	S	S	H	S	S	S	S	H	S	S
43	*S*	V	S	S	S	S	S	S	H	S	H	S	H	S
44	*S*	S	S	S	S	S	S	S	S	S	H	S	S	S
46	*S*	S	S	S	S	H	H	S	V	S	H	S	S	S
47	*S*	S	S	S	S	S	S	H	S	H	H	S	S	S
54	*S*	S	S	S	S	S	S	S	S	S	H	S	S	S
58	*S*	H	H	S	S	S	S	H	H	S	H	H	S	S
59	*S*	S	S	S	S	S	S	S	H	S	H	S	S	H
60	*S*	S	S	S	S	S	S	S	S	V	H	H	S	S
62	*S*	S	S	S	S	S	S	S	H	H	S	S	H	S
63	*S*	S	S	S	S	S	S	S	V	H	H	S	H	S
64	*S*	S	S	S	S	S	S	S	H	V	S	S	V	S
67	*S*	S	S	S	S	H	H	S	S	S	H	H	S	S
6	*V*	H	H	S	S	S	S	V	H	H	H	H	S	S
13	*V*	H	H	S	S	S	S	S	S	S	S	S	S	H
17	*V*	S	S	S	S	H	S	H	S	S	H	S	H	S
26	*V*	S	V	S	S	H	S	V	H	S	H	S	S	S
34	*V*	H	H	S	S	S	S	H	V	H	H	S	S	H
41	*V*	S	S	S	S	S	S	V	H	S	S	H	H	S
51	*V*	H	S	S	S	S	S	S	V	H	H	H	S	H
57	*V*	H	V	S	H	H	S	S	H	H	H	H	S	S

C1, C2, …. and C13 (see Table 11)

The confusion matrix for each of the 13 classifiers was generated to conclude the results of these classifiers. The 13 confusion matrixes are shown in Table 21.

Table 21.

The Confusion Matrixes of the Thirteen Classifiers in the Third Online Lesson

C_1: Single Tree

	Predicted		
Actual	H	S	V
H	6	14	3
S	4	20	8
V	5	3	0

C_2: TreeBoost

	Predicted		
Actual	H	S	V
H	7	15	1
S	6	25	1
V	3	3	2

C_3: SVM

	Predicted		
Actual	H	S	V
H	0	23	0
S	1	31	0
V	0	8	0

C_4: SVM

	Predicted		
Actual	H	S	V
H	1	21	1
S	2	30	0
V	1	7	0

C_5: SVM

	Predicted		
Actual	H	S	V
H	2	20	1
S	4	27	1
V	3	5	0

C_6: SVM

	Predicted		
Actual	H	S	V
H	2	21	0
S	6	25	1
V	0	8	0

C_7: Discriminant A.

	Predicted		
Actual	H	S	V
H	11	20	2
S	9	20	3
V	2	3	3

C_8: MLFN

	Predicted		
Actual	H	S	V
H	11	8	4
S	15	14	3
V	4	2	2

C_9: MLFN

	Predicted		
Actual	H	S	V
H	10	13	0
S	7	20	5
V	4	4	0

C_{10}: MLFN

	Predicted		
Actual	H	S	V
H	16	1	6
S	25	5	2
V	6	2	0

C_{11}: MLFN

	Predicted		
Actual	H	S	V
H	10	13	0
S	15	17	0
V	4	4	0

C_{12}: MLFN

	Predicted		
Actual	H	S	V
H	12	10	1
S	8	22	2
V	2	6	0

C_{13}: MLFN

	Predicted		
Actual	H	S	V
H	10	12	1
S	6	26	0
V	3	5	0

C1, C2, …. and C13 (see Table 11)

6.4 Correlations

It was hypothesized that there are correlations between classifying users based on their learning styles, using both mechanisms (the Tracking Mechanism and the Questions Mechanism), at each of the three online lessons and classifying users based on their learning styles using the Study Preference Questionnaire [2].

6.4.1 The First Online Lesson

The correlations between classifying users based on their learning styles using the 13 classifiers (in the first online lesson) and classifying users based on their learning styles using the Study Preference Questionnaire are shown in Table 22. It was found that a significant correlation at the 0.01 level (2-tailed) is shown between the questionnaire and the classifier (C_5: SVM Classifier), and it was found that a significant correlation at the 0.05 level (2-tailed) is shown between the questionnaire and the classifier (C_9: MLFN Neural Network Classifier). These two significant correlations are highlighted in the first row/column of Table 22.

[2] Appendix D shows the correlation between the Study Preference Questionnaire and all the 39 (13 per lesson) classifiers together in one table.

Table 22.

The Correlations between the Study Preference Questionnaire and the 13 Classifiers

during the First Online Lesson of The Classification System

		Q	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}
Q	r	1	0.099	0.096	0.004	-0.236	-0.358	-0.149	0.182	0.088	0.300	0.114	-0.022	0.181	0.115
	ρ		0.436	0.450	0.974	0.061	0.004	0.240	0.151	0.489	0.016	0.369	0.860	0.153	0.364
C_1	r	0.099	1	0.482	0.103	0.134	-0.291	0.150	0.483	-0.027	0.400	0.243	0.273	0.121	0.058
	ρ	0.436		0.000	0.419	0.291	0.020	0.237	0.000	0.831	0.001	0.053	0.029	0.341	0.648
C_2	r	0.096	0.482	1	0.326	0.170	-0.135	0.144	0.384	0.044	0.368	0.340	0.472	0.250	0.291
	ρ	0.450	0.000		0.009	0.178	0.286	0.256	0.002	0.729	0.003	0.006	0.000	0.047	0.019
C_3	r	0.004	0.103	0.326	1	0.428	0.002	0.267	0.248	0.114	0.232	0.347	0.205	-0.021	0.141
	ρ	0.974	0.419	0.009		0.000	0.986	0.033	0.048	0.372	0.065	0.005	0.103	0.872	0.266
C_4	r	-0.236	0.134	0.170	0.428	1	0.335	0.298	0.262	-0.069	0.115	0.124	0.075	0.090	-0.159
	ρ	0.061	0.291	0.178	0.000		0.007	0.017	0.037	0.587	0.365	0.330	0.556	0.480	0.209
C_5	r	-0.358	-0.291	-0.135	0.002	0.335	1	0.143	-0.085	-0.004	-0.318	-0.079	-0.082	-0.046	-0.161
	ρ	0.004	0.020	0.286	0.986	0.007		0.259	0.506	0.975	0.011	0.537	0.522	0.717	0.203
C_6	r	-0.149	0.150	0.144	0.267	0.298	0.143	1	0.164	-0.020	0.092	0.027	-0.013	-0.239	-0.160
	ρ	0.240	0.237	0.256	0.033	0.017	0.259		0.196	0.873	0.469	0.831	0.920	0.058	0.206
C_7	r	0.182	0.483	0.384	0.248	0.262	-0.085	0.164	1	0.091	0.255	0.326	0.405	0.151	-0.175
	ρ	0.151	0.000	0.002	0.048	0.037	0.506	0.196		0.472	0.042	0.009	0.001	0.234	0.167
C_8	r	0.088	-0.027	0.044	0.114	-0.069	-0.004	-0.020	0.091	1	0.187	0.167	0.145	0.091	-0.071
	ρ	0.489	0.831	0.729	0.372	0.587	0.975	0.873	0.472		0.138	0.188	0.252	0.473	0.579
C_9	r	0.300	0.400	0.368	0.232	0.115	-0.318	0.092	0.255	0.187	1	0.196	0.300	0.113	0.160
	ρ	0.016	0.001	0.003	0.065	0.365	0.011	0.469	0.042	0.138		0.120	0.016	0.373	0.206
C_{10}	r	0.114	0.243	0.340	0.347	0.124	-0.079	0.027	0.326	0.167	0.196	1	0.314	0.140	0.226
	ρ	0.369	0.053	0.006	0.005	0.330	0.537	0.831	0.009	0.188	0.120		0.011	0.269	0.073
C_{11}	r	-0.022	0.273	0.472	0.205	0.075	-0.082	-0.013	0.405	0.145	0.300	0.314	1	0.198	-0.009
	ρ	0.860	0.029	0.000	0.103	0.556	0.522	0.920	0.001	0.252	0.016	0.011		0.116	0.945
C_{12}	r	0.181	0.121	0.250	-0.021	0.090	-0.046	-0.239	0.151	0.091	0.113	0.140	0.198	1	0.183
	ρ	0.153	0.341	0.047	0.872	0.480	0.717	0.058	0.234	0.473	0.373	0.269	0.116		0.148
C_{13}	r	0.115	0.058	0.291	0.141	-0.159	-0.161	-0.160	-0.175	-0.071	0.160	0.226	-0.009	0.183	1
	ρ	0.364	0.648	0.019	0.266	0.209	0.203	0.206	0.167	0.579	0.206	0.073	0.945	0.148	

r The Pearson correlation value

ρ The ρ value (2-tailed)

Q The Study Preference Questionnaire

C_1, C_2, …. and C_{13} (see Table 11)

Correlation is significant at the 0.01 level (2-tailed)

Correlation is significant at the 0.05 level (2-tailed)

6.4.2 The Second Online Lesson

The correlations between classifying users based on their learning styles using the 13 classifiers (in the second online lesson) and classifying users based on their learning styles using the Study Preference Questionnaire are shown in Table 23. It was found that no significant correlations at the 0.05 level (2-tailed) are shown between the questionnaire and any of the 13 classifiers.

Table 23.

The Correlations between the Study Preference Questionnaire and the 13 Classifiers during the Second Online Lesson of The Classification System

		Q	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}
Q	r	1	0.072	-0.246	0.006	0.093	-0.072	-0.006	0.084	-0.133	-0.131	0.133	0.061	0.010	-0.017
	ρ		0.576	0.052	0.962	0.471	0.575	0.965	0.511	0.297	0.306	0.298	0.634	0.935	0.896
C_1	r	0.072	1	0.466	-0.347	-0.281	-0.198	-0.475	0.240	0.150	0.386	0.099	0.138	-0.044	0.196
	ρ	0.576		0.000	0.005	0.026	0.120	0.000	0.058	0.242	0.002	0.441	0.280	0.731	0.124
C_2	r	-0.246	0.466	1	-0.564	-0.222	-0.145	-0.478	0.231	0.089	0.648	0.016	0.236	0.210	0.266
	ρ	0.052	0.000		0.000	0.080	0.257	0.000	0.069	0.488	0.000	0.902	0.062	0.099	0.035
C_3	r	0.006	-0.347	-0.564	1	0.439	0.392	0.731	-0.259	-0.106	-0.480	0.059	-0.234	-0.087	0.144
	ρ	0.962	0.005	0.000		0.000	0.001	0.000	0.040	0.408	0.000	0.647	0.065	0.499	0.261
C_4	r	0.093	-0.281	-0.222	0.439	1	0.369	0.663	-0.159	-0.271	-0.214	0.076	-0.072	-0.071	0.119
	ρ	0.471	0.026	0.080	0.000		0.003	0.000	0.214	0.032	0.093	0.556	0.573	0.582	0.355
C_5	r	-0.072	-0.198	-0.145	0.392	0.369	1	0.446	0.015	-0.204	-0.297	-0.024	-0.289	-0.038	0.243
	ρ	0.575	0.120	0.257	0.001	0.003		0.000	0.910	0.109	0.018	0.850	0.022	0.766	0.055
C_6	r	-0.006	-0.475	-0.478	0.731	0.663	0.446	1	-0.141	-0.191	-0.373	0.031	-0.127	-0.153	0.047
	ρ	0.965	0.000	0.000	0.000	0.000	0.000		0.269	0.134	0.003	0.811	0.322	0.232	0.712
C_7	r	0.084	0.240	0.231	-0.259	-0.159	0.015	-0.141	1	0.044	0.198	-0.101	-0.013	0.076	-0.016
	ρ	0.511	0.058	0.069	0.040	0.214	0.910	0.269		0.733	0.119	0.431	0.919	0.555	0.901
C_8	r	-0.133	0.150	0.089	-0.106	-0.271	-0.204	-0.191	0.044	1	0.234	0.125	0.228	0.243	0.122
	ρ	0.297	0.242	0.488	0.408	0.032	0.109	0.134	0.733		0.065	0.327	0.073	0.055	0.340
C_9	r	-0.131	0.386	0.648	-0.480	-0.214	-0.297	-0.373	0.198	0.234	1	0.053	0.153	0.022	0.009
	ρ	0.306	0.002	0.000	0.000	0.093	0.018	0.003	0.119	0.065		0.682	0.233	0.867	0.941
C_{10}	r	0.133	0.099	0.016	0.059	0.076	-0.024	0.031	-0.101	0.125	0.053	1	0.055	-0.189	0.247
	ρ	0.298	0.441	0.902	0.647	0.556	0.850	0.811	0.431	0.327	0.682		0.668	0.137	0.051
C_{11}	r	0.061	0.138	0.236	-0.234	-0.072	-0.289	-0.127	-0.013	0.228	0.153	0.055	1	0.371	0.246
	ρ	0.634	0.280	0.062	0.065	0.573	0.022	0.322	0.919	0.073	0.233	0.668		0.003	0.052
C_{12}	r	0.010	-0.044	0.210	-0.087	-0.071	-0.038	-0.153	0.076	0.243	0.022	-0.189	0.371	1	0.190
	ρ	0.935	0.731	0.099	0.499	0.582	0.766	0.232	0.555	0.055	0.867	0.137	0.003		0.135
C_{13}	r	-0.017	0.196	0.266	0.144	0.119	0.243	0.047	-0.016	0.122	0.009	0.247	0.246	0.190	1
	ρ	0.896	0.124	0.035	0.261	0.355	0.055	0.712	0.901	0.340	0.941	0.051	0.052	0.135	

r The Pearson correlation value

ρ The ρ value (2-tailed)

Q The Study Preference Questionnaire

C_1, C_2, …. and C_{13} (see Table 11)

Correlation is significant at the 0.01 level (2-tailed)

Correlation is significant at the 0.05 level (2-tailed)

6.4.3 The Third Online Lesson

The correlations between classifying users based on their learning styles using the 13 classifiers (in the first online lesson) and classifying users based on their learning styles using the Study Preference Questionnaire are shown in Table 24. It was found that two significant correlations at the 0.05 level (2-tailed) are shown between the questionnaire and the two classifiers (C_{12}: MLFN Neural Network Classifier and C_{13}: MLFN Neural Network Classifier). These two significant correlations are highlighted in the first row/column of Table 24.

Table 24.

The Correlations between the Study Preference Questionnaire and the 13 Classifiers during the Third Online Lesson of The Classification System

		Q	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}
Q	r	1	0.100	0.142	-0.118	0.010	-0.028	-0.168	0.195	0.053	0.143	0.014	-0.030	0.250	0.273
	ρ		0.438	0.269	0.357	0.939	0.829	0.188	0.125	0.678	0.262	0.913	0.818	0.048	0.030
C_1	r	0.100	1	0.580	-0.099	0.043	-0.081	-0.115	0.065	0.269	0.274	0.071	0.347	-0.052	0.261
	ρ	0.438		0.000	0.442	0.736	0.530	0.372	0.612	0.033	0.030	0.581	0.005	0.686	0.039
C_2	r	0.142	0.580	1	-0.084	-0.078	-0.140	-0.265	0.305	0.170	0.260	0.149	0.126	0.061	0.234
	ρ	0.269	0.000		0.515	0.541	0.273	0.036	0.015	0.182	0.040	0.243	0.326	0.635	0.065
C_3	r	-0.118	-0.099	-0.084	1	-0.036	-0.057	-0.051	0.163	-0.151	-0.102	0.069	-0.117	-0.101	-0.086
	ρ	0.357	0.442	0.515		0.777	0.658	0.691	0.203	0.237	0.425	0.590	0.360	0.433	0.504
C_4	r	0.010	0.043	-0.078	-0.036	1	0.096	0.264	-0.223	0.074	-0.093	-0.026	-0.009	0.077	0.084
	ρ	0.939	0.736	0.541	0.777		0.454	0.037	0.080	0.565	0.467	0.840	0.944	0.548	0.511
C_5	r	-0.028	-0.081	-0.140	-0.057	0.096	1	0.487	-0.110	-0.095	-0.264	0.052	-0.099	-0.212	-0.205
	P	0.829	0.530	0.273	0.658	0.454		0.000	0.391	0.459	0.036	0.687	0.440	0.095	0.107
C_6	r	-0.168	-0.115	-0.265	-0.051	0.264	0.487	1	-0.233	-0.170	-0.298	-0.288	0.008	-0.218	0.090
	ρ	0.188	0.372	0.036	0.691	0.037	0.000		0.067	0.183	0.018	0.022	0.949	0.086	0.484
C_7	r	0.195	0.065	0.305	0.163	-0.223	-0.110	-0.233	1	-0.018	-0.034	0.144	0.002	0.059	-0.004
	ρ	0.125	0.612	0.015	0.203	0.080	0.391	0.067		0.889	0.794	0.262	0.986	0.647	0.978
C_8	r	0.053	0.269	0.170	-0.151	0.074	-0.095	-0.170	-0.018	1	0.084	-0.018	0.077	0.119	0.175
	ρ	0.678	0.033	0.182	0.237	0.565	0.459	0.183	0.889		0.511	0.891	0.547	0.352	0.171
C_9	r	0.143	0.274	0.260	-0.102	-0.093	-0.264	-0.298	-0.034	0.084	1	0.145	0.288	0.108	0.129
	ρ	0.262	0.030	0.040	0.425	0.467	0.036	0.018	0.794	0.511		0.258	0.022	0.399	0.312
C_{10}	r	0.014	0.071	0.149	0.069	-0.026	0.052	-0.288	0.144	-0.018	0.145	1	0.184	-0.195	-0.078
	ρ	0.913	0.581	0.243	0.590	0.840	0.687	0.022	0.262	0.891	0.258		0.148	0.126	0.544
C_{11}	r	-0.030	0.347	0.126	-0.117	-0.009	-0.099	0.008	0.002	0.077	0.288	0.184	1	-0.021	0.106
	ρ	0.818	0.005	0.326	0.360	0.944	0.440	0.949	0.986	0.547	0.022	0.148		0.867	0.409
C_{12}	r	0.250	-0.052	0.061	-0.101	0.077	-0.212	-0.218	0.059	0.119	0.108	-0.195	-0.021	1	-0.130
	ρ	0.048	0.686	0.635	0.433	0.548	0.095	0.086	0.647	0.352	0.399	0.126	0.867		0.308
C_{13}	r	0.273	0.261	0.234	-0.086	0.084	-0.205	0.090	-0.004	0.175	0.129	-0.078	0.106	-0.130	1
	ρ	0.030	0.039	0.065	0.504	0.511	0.107	0.484	0.978	0.171	0.312	0.544	0.409	0.308	

r The Pearson correlation value

ρ The ρ value (2-tailed)

Q The Study Preference Questionnaire

C_1, C_2, …. and C_{13} (see Table 11)

Correlation is significant at the 0.01 level (2-tailed)

Correlation is significant at the 0.05 level (2-tailed)

6.5 Important Features

The generated reports for the correlation between the Study Preference Questionnaire and each of the three online lessons, as shown in , show that two significant correlations were found between the Study Preference Questionnaire and the two classifiers (C_5: SVM Classifier and C_9: MLFN Neural Network Classifier) in the first online lesson. In addition, two significant correlations were found between the Study Preference Questionnaire and the two classifiers (C_{12}: MLFN Neural Network Classifier and C_{13}: MLFN Neural Network Classifier) in the third online lesson. There was a group of features, in each of these four classifiers, provided more valuable information than others for making a decision about classifying the learning styles of the participants. Table 25 shows the 10 most important features in the classifiers C_5 and C_9 in the first online lesson, and also it shows the 10 most important features in the classifiers C_{12} and C_{13} in the third online lesson.

Table 25.

The 10 Most Important Features in the Classifiers C_5 and C_9 in the First Online Lesson, and the 10 Most Important Features in the Classifiers C_{12} and C_{13} in the Third Online Lesson

C_5		C_9		C_{12}		C_{13}	
Q	9	Q	9	Q	9	Q	9
Q	8	L	d→o	N&L	3→3	N&L	1→3
L	c	Q	8	N&L	1→1→1	N&L	1→1→1
Q	7	L	c→o→d	N	1→1→1	L	d→d→o
L	o→c	N	3→1→3	N&L	1→2→1	N	1→1→1
L	o→d→d	L	d→o→d	N&L	2→1→2	N&L	3→2→3
N&L	1→2→3	N&L	3→3→1	N&L	2→3→3	N&L	2→3→2
N&L	1→3→d	L	c→o	N&L	3→2→3	N&L	2→2→2
N&L	d→3	L	c→d→o	L	d→o→o	N	3→2→1
Q	4	L	o→o→c	N	2→2	N&L	3→1→1

Q Question ID from the Questions Mechanism

L The Features, from the Letters Only Arrays, Extracted by the Tracking Mechanism

N The Features, from the Numbers Only Arrays, Extracted by the Tracking Mechanism

N&L The Features, from the Numbers & Letters Arrays, Extracted by the Tracking Mechanism

C_1, C_2, …. and C_{13} (see Table 11)

6.6 Conclusion

This chapter reviewed only the results of applying the Classifying System to 67 participants. At the beginning, the learning style of each of the participants, according to the Study Preference Questionnaire, was reviewed. Next, all the features extracted from all three online lessons, including the nine questions, were illustrated. Then, the 13 classifiers that were used to classify each of the participants to a learning style, according to the feature extracted, were reviewed, followed by their results on each of the three online lessons. Also, the correlation analysis to examine the degree and direction of relationships between the Study Preference Questionnaire and each of the 13 classifiers on each of the three online lessons was stated. The next chapter analyzes these results in a discussion that includes the limitations and the recommendations of this study.

7. DISCUSSION AND CONCLUSION

The purpose of this research was to infer the learning styles of students while they are browsing online instruction. The focus of this study was on the three cognitive learning styles: holist, serialist, and versatile. In order to achieve this goal, a system was developed, called Classification System, which contains three online lessons and uses two mechanisms (the Tracking Mechanism and the Questions Mechanism) to extract useful information about the users' behaviors. The extracted features were used by a collection of classifiers to infer the users' learning styles. These results were compared with the results of the Study Preference Questionnaire by calculating the Pearson correlation (2-tailed) between them.

The remainder of this chapter is organized as follows. An overview of this study is described in Section 7.1. The results of the three hypotheses of this study are shown in Section 7.2, and the answers on the study's five research questions are shown in Section 7.3. An overview of some of the limitations of this study is found in Section 7.4. Section 7.5 presents the recommendations for future studies. Section 7.6 concludes with the implications of this study.

7.1 Overview of this Study

This study was conducted at The University of Kansas during the fall semester of 2006. The participants were 67 undergraduate students. The students were given an online version of the Study Preference Questionnaire in order to infer their cognitive learning style. This was considered to be the ground truth for the study. The participants were then asked to complete three online lessons that were built by assembling a group of learning objects from a repository that was developed for the purpose of this research. During the third online lesson, the participants answered nine questions about the learning styles.

After the three online lessons were completed, a number of features were extracted from each lesson using the two mechanisms (the Tracking Mechanism and the Questions Mechanism). The Tracking Mechanism examined the order in which learning objects were visited and used this information to extract 336 features from the students' behavior on each lesson, the Questions Mechanism extracted nine features from the students' responses to the nine questions in the third online lesson. The extracted features from the nine questions were added to the rest of the extracted features from each of the three online lessons, which resulted in 345 features extracted from each lesson. The extracted features were used to classify the users' learning style for each lesson.

This study found two significant correlations between the Study Preference Questionnaire and two classifiers during the first online lesson. While no significant correlations were found between the Study Preference Questionnaire and the classifiers during the second online lesson, two significant correlations were found between the Study Preference Questionnaire and two classifiers during the third online lesson.

7.2 Hypotheses and the Results

1. There are correlations between classifying users based on their learning styles using the Classification System during the first online lesson and classifying users based on their learning styles using the Study Preference Questionnaire.

Two significant correlations were found between the Study Preference Questionnaire and the two classifiers (C_5: SVM Classifier and C_9: MLFN Neural Network Classifier) in the first online lesson as was shown in Table 22. The questionnaire and the C_5 Classifier in this lesson are negatively related (r=-0.358); the correlation coefficient is quite low. Since there is evidence to accept the hypothesis (ρ=0.004), it was concluded that the correlation between these two variables is significant at the 0.01 level (2-tailed). However, the questionnaire and the C_9 Classifier in this lesson are positive related (r=0.300); the correlation coefficient is quite low. Since there is evidence to accept the hypothesis (ρ=0.016), it was concluded that the correlation between these two variables is significant at the 0.05 level (2-tailed).

2. There are correlations between classifying users based on their learning styles using the Classification System during the second online lesson and classifying users based on their learning styles using the Study Preference Questionnaire.

The best correlation between the Study Preference Questionnaire and the classifiers in the second online lesson, as was shown in Table 23, was found on (C_2: TreeBoost); however, there is no evidence to accept the hypothesis (ρ=0.052).

Therefore, the hypothesis was rejected because there was no significant correlation at the 0.05 level (2-tailed).

3. There are correlations between classifying users based on their learning styles using the Classification System during the third online lesson and classifying users based on their learning styles using the Study Preference Questionnaire.

Two significant correlations were found between the Study Preference Questionnaire and the two classifiers (C_{12}: MLFN Neural Network Classifier and C_{13}: MLFN Neural Network Classifier) in the third online lesson as was shown in *Table 24*. The questionnaire and the C12 Classifier in this lesson are positive related (r=0.250); the correlation coefficient is quite low. Since there is evidence to accept the hypothesis (ρ=0.048), it was concluded that the correlation between these two variables is significant at the 0.05 level (2-tailed). The questionnaire and the C_{13} Classifier in this lesson are also positive related (r=0.273); the correlation coefficient is quite low. Since there is evidence to accept the hypothesis (ρ=0.030), it was concluded that the correlation between these two variables is significant at the 0.05 level (2-tailed).

7.3 Research Questions

1. Does tracking the sequences of visited learning objects on each lesson map provide helpful information to infer learning styles?

It was found that tracking the sequences of visited learning objects on each lesson map provided helpful information to infer learning styles. All the classifiers that reported significant correlation had a number of features extracted from the Tracking Mechanism that were important in making the decision.

2. Does asking users questions about their preference in learning styles provide helpful information to infer learning styles?

It was found that asking users questions about their preference in learning styles provides helpful information to infer learning styles. All the classifiers that reported significant correlation, had number of features extracted from the Questions Mechanism that were important in making the decision.

3. How many lessons does the Classification System need to examine in order to infer learning styles?

Significant correlations were found between the Study Preference Questionnaire and two classifiers in the first online lesson and two classifiers in the third online lesson. Therefore, it was concluded that the Classification System was able to infer the learning styles of the participants after the first online lesson.

4. Which features that can be extracted from users' behaviors help to classify their learning styles?

There was a group of features provided more valuable information than others for making a decision about classifying the learning styles of the participants during the three online lessons. From the Questions Mechanism, three features were important: Question #4, Question #6, and Question #9. On the other hand, the important features from the Tracking Mechanism can be categorized in three groups: The first group contains the important features in the Numbers Only arrays. The second group contains the important features in the Letters Only arrays. The third group contains of the important features in the Numbers & Letters arrays. Table 26 shows the important features in each of the three groups, plus the important features in the Questions Mechanism.

Table 26.

The Important Features for the Four Classifiers that reported Significant Correlation. These classifiers are C_5 (from the first online lesson), C_9 (from the first online lesson), C_{12} (from the third online lesson), and C_{13} (from the third online lesson).

#	The Tracking Mechanism			The Question Mechanism
	Group 1 (Numbers only arrays)	Group 2 (Letters only arrays)	Group 3 (Numbers and Letters arrays)	
1	1→1→1	c	1→1→1	7
2	2→2	c→d→o	1→2→1	8
3	3→1→3	c→o	1→2→3	9
4	3→2→1	c→o→d	1→3	
5		d→d→o	1→3→d	
6		d→o	2→1→2	
7		d→o→d	2→2→2	
8		d→o→o	2→3→2	
9		o→c	2→3→3	
10		o→d→d	3→1→1	
11			3→2→3	
12			3→3	
13			3→3→1	

14			d→3	

5. Which classification models provide significant correlation between the Study Preference Questionnaire and the features extracted from each online lesson?

At the first online lesson, there were two classifiers with significant correlations: C_5: SVM Classifier and C_9: MLFN Neural Network Classifier. The second online lesson had no classifier with significant correlation. However, in the third online lesson, there were two classifiers with significant correlations: C_{12}: MLFN Neural Network Classifier and C_{13}: MLFN Neural Network Classifier.

7.4 Research Limitations

Ford (1985), the author of the Study Preference Questionnaire used as a ground truth in this study, used two instruments to validate his questionnaire. He reported that the Study Preference Questionnaire has 17.39% misclassification errors. The current study used only his questionnaire to validate the Classification System. Use of the single instrument for validation was done primarily to eliminate the extra time and cost to the participants that would have occurred if they had had to respond to a second instrument. Therefore, it is recommended that future studies use more than one instrument to validate the result from the Classification System.

Another limitation of this research is the fact that the first mechanism, the Tracking Mechanism, extracts 336 features, but most of them contain the value zero. The features with zero value may add noise to the classifiers. Therefore, it is recommended to measure the effect of this noise in future studies.

7.5 Recommendations for Future Research

This researcher recommends adding new extensions to the two mechanisms used in this study. The first mechanism, the Tracking Mechanism, extracts a number of features from the Tracking Patterns. A group of arrays was built up to three dimensions, and it is recommended that future research build other arrays with more than three dimensions. The second mechanism, the Questions Mechanism, extracts features from nine questions in the third online lesson. Some of these questions provided more valuable information than others for making a decision about classifying the learning styles of the participants. Therefore, it is recommended that more studies be conducted about choosing these questions and using them to reinforce the features from the first mechanism.

This researcher also recommends investigating the user interfaces for the three online lessons. The user interfaces for three online lessons are slightly different from each other. In order to confirm the best interface to achieve the better result, the same lesson needs to be built in different layouts and the layouts tested on a different group of students. For example, in the current research, the lesson map is in the footer frame in the Classification System. In future studies, the lesson map could be in the left frame. Therefore, it is recommended that more studies be conducted about the effect of different user interfaces on students' behaviors.

In addition, this researcher recommends adding the viewing time of each learning object and the students' prior knowledge as new features in further studies. This research found that some of the participants had knowledge about the contents of some learning objects, which may have influenced how long they viewed these learning objects. For example, if a student knows the contents of all the learning objects of a lesson, that student may spend less time than other students with the same learning style. The two new variables, the viewing time of each learning object and the students' prior knowledge, introduce two new hypotheses for future research:

- "There is a correlation between the learning styles of the students and the time spent on each learning object."

- "There is a correlation between the time spent on each learning object and the prior knowledge of student."

Other variables that can be added in further studies are gender, age, and nationality. This research tried to infer the learning styles of online users by tracking their progresses in three online lessons, including their answers to nine questions. However, it does not include in the extracted features any personal information, such as gender, age, or nationality. Therefore, it is recommended that these variables be added in future studies.

7.6 Conclusion

The intent of this research was to develop an Adaptive Learning Environment without the users explicitly completing a learning style questionnaire. The purpose of this study was to develop mechanisms that can be used to infer the learning styles of users by observing their behaviors during a group of online lessons. The focal point of this research was on learners with one of the three cognitive learning styles: holist, serialist, or both (versatile). To do this, a system called the Classification System, which is capable of substituting for the questionnaires, was developed. The Classification System contained three online lessons and used two mechanisms (the Tracking Mechanism and the Questions Mechanism) to infer the cognitive learning styles of the users. The Classification System was evaluated on a group of participants from the Computer Science Department at The University of Kansas. The major implication of this study is that the Classification System developed for the purpose of the study was able to infer the learning styles of its users correctly.

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APPENDIX A: LEARNING OBJECTS CONTENT

10100

<UL>
<LI>often need to look at data values and make choices in programs</LI>
<LI>logical expressions are true/false statements of data relationships</LI>
<LI>simple logical expressions are of the form: (data operator data)</LI>
<LI>data terms are either variables or constants</LI>
<LI>operator terms are either relational or equality operators</LI>
</UL>

10118

<UL>
<LI>can combine expressions to get complex logical expressions</LI>
<LI>useful for more realistic data comparison tasks</LI>
<LI>syntax of the form: (expression operator expression)</LI>
<LI>expression is a simple logical expression</LI>
<LI>operator is a logical operator</LI>
</UL>

10119

<UL>
<LI>placing a semicolon after a Boolean expression will cause the "empty statement" to be executed instead of the desired code</LI>
<LI>missing or unmatched ( ) brackets in logical expressions</LI>
<LI>complex logical expression should use nested (( ) && ()) format</LI>
<LI>accidental use of !! instead of || for specifying an OR</LI>
<LI>incorrect use of DeMorgans law resulting in wrong code</LI>
<LI>missing or unmatched { } brackets in if-else or switch statement</LI>
<LI>missing break on switch causes multiple cases to be executed</LI>
<LI>beware use of => =< and =! they are syntactically incorrect</LI>
<LI>beware use of & and | they have a different meaning</LI>
<LI>beware use of = instead of == it has a different meaning</LI>
</UL>

10121

DeMorgan's law can sometimes make it more convenient for us to express a logic expression. These laws stat that the expression:

    <I>!(condition1 && condition2)</I> is logically equivalent to the expression <I>(!condition1 || !condition2)</I>.

10124

<UL>
<LI>can selectively execute code using if statement</LI>
<LI>when logical expression is true, selected code is executed</LI>
<LI>when logical expression is false, selected code is skipped</LI>
<LI>selected code can be either a single statement or a block of statements which is enclosed in { } characters</LI>
<LI>should indent code to aid program readability</LI>
<LI>you only need semi-colon after single statements, not after { }</LI>
<LI>NEVER put a semi-colon directly after the Boolean expression or you will execute the null statement instead of the code you intended</LI>
</UL>

10130

<UL>
<LI>often need two alternatives in an if statement</LI>
<LI>want to execute certain code if expression is true</LI>
<LI>want to execute different code if expression is false</LI>
<LI>the if-else statement lets you do this</LI>
<LI>can use single statement or block of code for either part</LI>
<LI>should indent code to aid program readability</LI>
</UL>

10143

<UL>
<LI>switch statement convenient for handling multiple if-else cases</LI>
<LI>need to use single value as decision variable</LI>
<LI>need to identify code to be executed for each case</LI>
<LI>it is essential to end each case with break command</LI>
<LI>can use default for all cases
not specifically labeled</LI>
</UL>

10146

<UL>
<LI>often need to check one condition within another</LI>
<LI>can nest if statements to accomplish this</LI>
<LI>need to take care when matching up { } brackets</LI>
<LI>use indentation to reflect nesting and aid readability</LI>
</UL>

10150
The <I>LESS THAN</I> operator compares two values together.

Let us assume the first value is v1 and the second value is v2:

(v1 LESS THAN v2) is true if the value of the v1 is less than the value of v2

10151
The <I>GREATER THAN</I> operator compares two values together.

Let us assume the first value is v1 and the second value is v2:

(v1 GREATER THAN v2) is true if the value of the v1 is greater than the value of v2

10151
The symbol for the <I>GREATER THAN</I> operator is <B>></B>

<I>For example:</I>

(v1 > v2) is true if the value of the v1 is greater than the value of v2

10152
The <I>LESS THAN OR EQUAL</I> operator compares two values together.

Let us assume the first value is v1 and the second value is v2:

(v1 LESS THAN OR EQUAL v2) is true if the value of the v1 is less than or same as the value of v2

10153
The <I>GREATER THAN OR EQUAL</I> operator compares two values together.

Let us assume the first value is v1 and the second value is v2:

(v1 GREATER THAN OR EQUAL v2) is true if the value of the v1 is greater than or same as the value of v2

10154
The <I>EQUAL TO</I> operator compares two values together.

Let us assume the first value is v1 and the second value is v2:

(v1 EQUAL TO v2) is true if the value of the v1 is the same as the value of v2

10155
The <I>NOT EQUAL TO</I> operator compares two values together.

Let us assume the first value is v1 and the second value is v2:

(v1 NOT EQUAL TO v2) is true if the value of the v1 is not the same as the value of v2

10156
The <I>AND</I> operator compares two expressions together.

Let us assume the first expression is e1 and the second expression is e2:

(e1 AND e2) is true if both e1 and e2 are true

10157
The <I>OR</I> operator compares two expressions together.

Let us assume the first expression is e1 and the second expression is e2:

(e1 OR e2) is true if either e1 or e2 are true

10158
The <I>NOT</I> operator reverses the logical value of an expression.
<UL>
<LI>(NOT true) is same as "false"</LI>
<LI>(NOT false) is same as "true"</LI>
</UL>

10160
an abstract data type (ADT) is a specification of a set of data and the set of operations that can be performed on the data. Such a data type is abstract in the sense that it is independent of various concrete implementations thus cannot be operated on directly. The definition can be mathematical, or it can be programmed as an interface. The interface provides a constructor, which returns an abstract handle to new data, and several operations, which are functions accepting the abstract handle as an argument. Majority of typical ADTs have set operations and they are sometimes called <I>dynamic sets</I>.

(taken from www.Wikipedia.com)

10161
C++ is a bunch of small additions to C, with a few major additions. One major addition is the object-oriented approach. As the name object-oriented programming suggests, this approach deals with objects. Of course, these are not real-life objects themselves. Instead, these objects are the essential definitions of real world objects. Classes are collections of data related to a single object type. Classes not only include information regarding the real world object, but also functions to access the data, and classes possess the ability to inherit from other classes.

If a class is a house, then the functions will be the doors and the variables will be the items inside the house. The functions usually will be the only way to modify the variables in this structure, and they are usually the only way even to access the variables in this structure. This might seem silly at first, but the idea to make programs more modular - the principle itself is called "encapsulation". The key idea is that the outside world doesn't need to know exactly what data is stored inside the class--it just needs to know which functions it can use to access that data. This allows the implementation to change more easily because nobody should have to rely on it except the class itself.

(taken from http://www.cprogramming.com)

10162 <UL>
<LI>Often want to hide details of data structure</LI>
<LI>Protect users of ADT from implementation changes</LI>
<LI>We want to simplify the generalization of ADTs</LI>
<LI>Combine data and operations to make new types</LI>
<LI>Syntax for classes provides this object oriented feature</LI>
</UL>

10163
<UL>
<LI>Need to provide implementation of class functions</LI>
<LI>Code looks very similar to struct/function code</LI>
<LI>We reference fields of class without "." dots</LI>
<LI>Class name and "::" symbol are used before function names to identify class being implemented</LI>
<LI>We are allowed to have several routines with same name for different classes (called method overloading)</LI>
</UL>

10164
<UL>
<LI>We need to declare variables of a class to store and manipulate data</LI>
<LI>Variables of a class are called objects (instances of a class type)</LI>
<LI>Objects have a special calling mechanism for class functions that use the "." dot notation</LI>
<LI>We can not access fields of class that are private (this was the whole point!)</LI>
<LI>Objects have random values unless initialized</LI>
</UL>

10165
<UL>
<LI>We often want to initialize data when object declared</LI>
<LI>We may also want to allocate memory space or open files when an object declared</LI>
<LI>Constructors are special functions whose name is same as class</LI>
<LI>Constructor functions are called automatically when an object is declared</LI>
</UL>

10166
<UL>
<LI>We often need additional functions to simplify class implementation</LI>
<LI>Example: I/O functions or error checking functions</LI>
<LI>All functions declared in the private section they are hidden from users</LI>
<LI>Implementation is identical to the public functions</LI>
<LI>Private functions can access private variables just like public object functions</LI>
<LI>Calling of utility functions does not require xxx. prefix</LI>
</UL>

10167
<UL>
<LI>We may need to combine several object definitions in order to create our program</LI>
<LI>We can use #include command to combine multiple files at compile time</LI>
<LI>This will compile all class definitions and implementations with program</LI>
<LI>This approach can be very slow, particularly if many classes are involved</LI>
<LI>Much faster to compile if we separate declaration and implementation</LI>
<OL>
<LI>put xxx class definition in xxx.h file</LI>
<LI>put xxx class implementation in xxx.cpp file</LI>
<LI>include xxx.h in your main.cpp program</LI>
<LI>compile xxx.cpp (that includes xxx.h) into xxx.o</LI>
<LI>compile your main.cpp program into main.o</LI>
<LI>link main.o and xxx.o together to create program</LI>
</OL>
<LI>Following makefile example automates this process</LI>
<LI>You MUST use TAB to indent the compile commands</LI>
<LI>Type “make” at the unix prompt to compile your code</LI>
</UL>

10169
<UL>
<LI>Data representation useful for problem decomposition</LI>
<LI>ADTs contain a collection of functions that manipulate this data structure</LI>
<LI>Can be implemented via structs and functions</LI>
<LI>Can formalize implementation and usage via classes</LI>
</UL>

10180

An array declaration is very similar to a variable declaration. First a type is given for the elements of the array, then an identifier for the array and, within square brackets, the number of elements in the array. The number of elements must be an integer.

(taken from http://www.cee.hw.ac.uk)

10181

Given the declaration above of a 100 element array the compiler reserves space for 100 consecutive floating point values and accesses these values using an index/subscript that takes values from 0 to 99. The first element in an array in C++ always has the index 0, and if the array has n elements the last element will have the index n-1.

An array element is accessed by writing the identifier of the array followed by the subscript in square brackets.

(taken from http://www.cee.hw.ac.uk)

10182

The initialisation of simple variables in their declaration has already been covered. An array can be initialised in a similar manner. In this case the initial values are given as a list enclosed in curly brackets.

Note that the array has not been given a size, the compiler will make it large enough to hold the number of elements in the list.

(taken from http://www.cee.hw.ac.uk)

10183

Multidimensional arrays can be described as "arrays of arrays". For example, a bidimensional array can be imagined as a bidimensional table made of elements, all of them of a same uniform data type.

Multidimensional arrays are not limited to two indices (i.e., two dimensions). They can contain as many indices as needed. But be careful! The amount of memory needed for an array rapidly increases with each dimension. For example:
<UL>
<LI>Often need to store matrices (or images) in arrays</LI>
<LI>Need to give array name, type, and size in each dimension</LI>
<LI>Arrays are accessed by using row and column of element</LI>
<LI>2D arrays can also be initialized similarly to 1D arrays</LI>
<LI>Use name[R][C] when declaring 2D array parameters, where R is the number of rows and C is number of columns</LI>
<LI>Use array name when passing 2D array into a function</LI>
</UL>

10184

<I>for</i> statements are the usual means of accessing every element in an array.

(taken from http://www.cee.hw.ac.uk)

10185

In passing an array as a parameter to a function it is passed as a reference parameter. What is actually passed is the address of its first element. Since arrays are passed by reference this means that if the function changes the value of an element in an array that is a parameter of the function then the corresponding actual array of the call will have that element changed.

Though an array is passed as a reference parameter an & is not used to denote a reference parameter. However it must be indicated to the compiler that this parameter is an array by appending [] to the formal parameter name.
<UL>
<LI>We can pass individual array elements or whole arrays into functions as parameters</LI>
<LI>To pass an entire array, add [ ] after the array name</LI>
<LI>Use another parameter for the size of the array</LI>
<LI>Array passing is automatically by reference (no & needed)</LI>
<LI>There is NO way to pass arrays by value</LI>
<LI>We can protect the contents of an array using const</LI>
</UL>

10186

An array is a series of elements of the same type placed in contiguous memory locations that can be individually referenced by adding an index to a unique identifier.

That means that, for example, we can store 5 values of type int in an array without having to declare 5 different variables, each one with a different identifier. Instead of that, using an array we can store 5 different values of the same type, int for example, with a unique identifier.

(taken from http://www.cplusplus.com)

10187

Although useful in their own right, arrays also form the basis for several more complex data structures, such as heaps, hash tables, and VLists, and can be used to represent strings, stacks and queues. They also play a more minor role in many other data structures. All of these applications benefit from the compactness and locality of arrays.

One of the disadvantages of an array is that it has a single fixed size, and although its size can be altered in many environments, this is an expensive operation. Dynamic arrays or growable arrays are arrays which automatically perform this resizing as late as possible, when the programmer attempts to add an element to the end of the array and there is no more space. To average the high cost of resizing over a long period of time (we say it is an amortized cost), they expand by a large amount, and when the programmer attempts to expand the array again, it just uses more of this reserved space.

In the C programming language, one-dimensional character arrays are used to store null-terminated strings, so called because the end of the string is indicated with a special reserved character called a null character ('\0') (see also C string).

Finally, in some applications where the data are the same or are missing for most values of the indexes, or for large ranges of indexes, space is saved by not storing an array at all, but having an associative array with integer keys. There are many specialized data structures specifically for this purpose, such as Patricia tries and Judy arrays. Example applications include address translation tables and routing tables.

(taken from http://wikipedia.org)

10188

Linear search is a search algorithm, also known as sequential search, that is suitable for searching a set of data for a particular value.

It operates by checking every element of a list one at a time in sequence until a match is found. Linear search runs in O(N). If the data are distributed randomly, on average N/2 comparisons will be needed. The best case is that the value is equal to the first element tested, in which case only 1 comparison is needed. The worst case is that the value is not in the list, in which case N comparisons are needed.
<UL>
<LI>We may want to know max or min value in an array</LI>
<LI>We may want to know if certain value exists in array</LI>
<LI>We must use linear search if data is unordered</LI>
<LI>We can use either while loops, for loops or recursion</LI>
</UL>

10189

A binary search algorithm (or binary chop) is a technique for finding a particular value in a linear array, by ruling out half of the data at each step, widely but not exclusively used in computer science. A binary search finds the median, makes a comparison to determine whether the desired value comes before or after it, and then searches the remaining half in the same manner.
<UL>
<LI>We can use sorted array for very fast array search
<LI>Similar to searching phone book - divide and conquer
<OL>
<LI>look at middle element of array portion
<LI>if equal to desired value, you found it
<LI>if less than desired value, search right half of array
<LI>if greater than desired value, search left half of array
<LI>repeat until data is found or unsearched array is empty
</OL>
<LI>This only takes 10 steps to search array of 1024 elements
<LI>Iterative and recursive binary search solutions possible
<LI>We must carefully consider array endpoints
</UL>

10189

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</OL>
<LI>This only takes 10 steps to search array of 1024 elements
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<LI>We must carefully consider array endpoints
</UL>

10190

<UL>
<LI>May need to output array in ascending or descending order</LI>
<LI>May need to search array more efficiently (binary search)</LI>
<LI>There are many sorting algorithms which vary in speed</LI>
<LI>One easy algorithm is selection sort</LI>
<OL>
<LI>for each location in the array</LI>
<LI>find smallest value in unsorted part of array</LI>
<LI>copy value to end of sorted part of array</LI>
</OL>
</UL>

10191

<UL>
<LI>Median is defined to be midpoint value of set of values
<LI>Half of the data values are larger and half are smaller
<LI>Find median by first sorting list and selecting mid element
<LI>Need to decide how to handle even length arrays
<UL>
<LI>Round down to get mid</LI>
<LI>Round up to get mid</LI>
<LI>Average two mid values</LI>
</UL>
</UL>

15100

Let us examine the meaning of TRUE and FALSE in computer terminology. A true statement is one that evaluates to a nonzero number. A false statement evaluates to zero. When you perform comparison with the relational operators, the operator will return 1 if the comparison is true, or 0 if the comparison is false. For example, the check 0 == 2 evaluates to 0. The check 2 == 2 evaluates to a 1. If this confuses you, try to use a cout statement to output the result of those various comparisons (for example cout<< (2 == 1);)

They are two types of the Logic Expression:

<OL>
<LI>Simple Logic Expression:</LI>

Checking of one value stored by a variable against another value to determine whether one is larger, smaller, or equal to the other.

The operators for Simple Logic Expression are:
<table border=0>
<tr><td><B> Operator </B></td><td><B> Description </B></td></tr>
<tr><td>==</td><td>equal</td></tr>
<tr><td>!=</td><td>not equal</td></tr>
<tr><td>></td><td>greater than</td></tr>
<tr><td>>=</td><td>greater than or equal</td></tr>
<tr><td><</td><td>less than</td></tr>
<tr><td><=</td><td>less than or equal</td></tr>
</table>

<LI>Complex Logic Expression:</LI>

A way of checking multiple conditions at once, to make conditional expressions more useful.

The operators for Simple Logic Expression are:
<table border=0>
<tr><td><B>Operator</B></td><td><B>Description</B></td></tr>
<tr><td>&&</td><td>and</td></tr>
<tr><td>||</td><td>or</td></tr>
<tr><td>!</td><td>not</td></tr>
</table>
</OL>
The last section of the Logic Expression will describe the Common Errors that programmers make when they use Logic Expression with Conditional Statments.

15113

The ability to control the flow of your program, letting it make decisions on what code to execute, is valuable to the programmer.

The if statement allows you to control if a program enters a section of code or not based on whether a given condition is true or false.

One of the important functions of the if statement is that it allows the program to select an action based upon the user's input.

For example, by using an if statement to check a user entered password, your program can decide whether a user is allowed access to the program.

The following sections represent three types of the IF statments:
<OL>
<LI>IF: If statements allow the flow of the program to be changed, and so they allow algorithms and more interesting code.</LI>
<LI>IF-ELSE: The ELSE statment gives an alternative path to be executed if the IF statment condition is False.</LI>
<LI>Nested IF: Here, you will see a group of IF statments that each checks one condition within another.</LI>
</OL>

Without a conditional statement such as the if statement, programs would run almost the exact same way every time.

15150

When programming, the aim of the program will often require the checking of one value stored by a variable against another value to determine whether one is larger, smaller, or equal to the other.

There are a number of operators that allow these checks.

Here are the relational operators, as they are known:

<table border=0>
<tr><td width=10>></td><td>greater than</td></tr>
<tr><td><</td><td>less than</td></tr>
<tr><td>>=</td><td>greater than or equal</td></tr>
<tr><td><=</td><td>less than or equal</td></tr>
<tr><td>==</td><td>equal to</td></tr>
<tr><td>!=</td><td>not equal to</td></tr>
</table>

<I>(taken from http://www.cprogramming.com)</I>

15156	 Logical operators are a way of checking multiple conditions at once, to make conditional expressions more useful. These operators allow a programmer to check: <I>if (x is more than 10 and eggs is less than 20 and x is not equal to a...)</I> There are three logical operators: 'and', 'or' and 'not'. These are represented in C++ using && for 'and', || for 'or', and ! for 'not'.
15160	<UL> <LI>First: No abstraction => spaghetti code</LI> <LI>Second: Procedural abstraction => structured programming - <B>Abstract Data Types</B></LI> <LI>Third: Data abstraction => object oriented programming - <B>Classes</B></LI> <LI>Reflects evolution in software engineering practices</LI> <LI>Abstraction hides unnecessary details from people</LI> <LI>Larger problem solutions require more abstraction</LI> </UL>
15161	 Developing <I>Class</I> in C++ requires some of the following steps: <OL> <LI>Declaration: declare the member data and member functions, and wrap them up inside an object declaration</LI> <LI>Implementation: in the first step, the functions are declared but not defined. That is, an implementation for each method must be written.</LI> <LI>Usage: shows the way to use the class</LI> <LI>Constructors: constructor functions are called automatically when an object is declared </LI> <LI>Private Functions: functions hidden from users and can access private variables just like public object functions </LI> <LI>Hearders: a way to organize writting classes in C++</LI> </OL>
1	 Abstact Data Types organize the code by grouping the related data together in a group called structure.
15186	 Some of the subtopics need to be described in the arrays are: <UL> <LI><i>Declaration:</i> is very similar to a variable declaration.</LI> <LI><i>Access:</i> by writing the identifier of the array followed by the subscript in square brackets.</LI> <LI><i>Initalization:</i> the initial values are given as a list enclosed in curly brackets.</LI> <LI><i>Muttidimensional:</i> can be described as "arrays of arrays".</LI> <LI><i>with Loop:</i> <i>for</i> statements are the usual means of accessing every element in an array.</LI> <LI><i>with Function:</i> passing an array as a parameter to a function it is passed as a reference parameter.</LI> </UL>
15187	 Some of the array applications described in more detail in this lesson are: - <i>Linear Array Search:</i> operates by checking every element of a list one at a time in sequence until a match is found. - <i>Binary Array Search:</i> finds the median, makes a comparison to determine whether the desired value comes before or after it. - <i>Sorting:</i> using ascending or descending order. - <i>Median Value:</i> calculates the midpoint value of set of values.
15222	 Some of the array applications described in more detail in this lesson are: - <i>Linear Array Search:</i> operates by checking every element of a list one at a time in sequence until a match is found. - <i>Binary Array Search:</i> finds the median, makes a comparison to determine whether the desired value comes before or after it. - <i>Sorting:</i> using ascending or descending order. - <i>Median Value:</i> calculates the midpoint value of set of values.

20124	
	
	if (TRUE)
	
	   // Execute the next statement
	
	
	To have more than one statement execute after an if statement that evaluates to true, use braces. Anything inside braces is called a compound statement, or a block. For example:
	
	
	
	if (TRUE)
	
	{
	
	   // Execute all statements inside the braces
	
	}
	

20130

```
<BR>The code after the ELSE statment (whether a single line or code between brackets) is executed if the if statement is FALSE.
<BR>
<font color=green>
<BR>if ( TRUE )
<BR>{
<BR>   // Execute these statements if TRUE
<BR>}
<BR>else
<BR>{
<BR>   // Execute these statements if FALSE
<BR>}
</font>
```

20138

```
<BR>if ( Boolean expression 1 )
<BR>{
<BR>   // execute if expression 1 is true
<BR>   if ( Boolean expression 2 )
<BR>   {
<BR>      // execute if expression 2 is true
<BR>   }
<BR>   else
<BR>   {
<BR>      // execute if expression 2 is false
<BR>      if ( Boolean expression 3 )
<BR>      {
<BR>         // execute if expression 3 is true
<BR>      }
<BR>   }
<BR>}
<BR>else
<BR>{
<BR>   // execute if expression 1 is false
<BR>   if ( Boolean expression 4 )
<BR>   {
<BR>      // execute if expression 4 is true
<BR>   }
<BR>}
```

20143

```
<font color=green>
<BR>switch ( decision value )
<BR>{
<BR>   case label1 : statements;
<BR>      break;
<BR>   case label2: statements;
<BR>      break;
<BR>   ...
<BR>   default:  statements;
<BR>}
</font>
<BR>
<BR>As you can see in the above scheme the case and default have a "break;" statement at the end of block. This expression will cause the program to exit from the switch, if break is not added the program will continue execute the code in other cases even when the integer expression is not equal to that case.
```

20150

```
<BR>The symbol for the <I>LESS THAN</I> operator is <B><</B>
<BR>
<BR><I>For example:</I>
<BR><font color=green>(v1 < v2)</font> is true if the value of the v1 is less than the value of v2
```

20152

```
<BR>The symbol for the <I>LESS THAN OR EQUAL</I> operator is <B><=</B>
<BR>
<BR><I>For example:</I>
<BR><font color=green>(v1 <= v2)</font> is true if the value of the v1 is less than or same as the value of v2
```

20153

```
<BR>The symbol for the <I>GREATER THAN OR EQUAL</I> operator is <B>>=</B>
<BR>
<BR><I>For example:</I>
<BR><font color=green>(v1 >= v2)</font> is true if the value of the v1 is greater than or same as the value of v2
```

20154

```
<BR>The symbol for the <I>EQUAL TO</I> operator is <B>==</B>
<BR>
<BR><I>For example:</I>
<BR><font color=green>(v1 == v2)</font> is true if the value of the v1 is the same as the value of v2
```

20155

```
<BR>The symbol for the <I>NOT EQUAL TO</I> operator is <B>!=</B>
<BR>
<BR><I>For example:</I>
<BR><font color=green>(v1 != v2)</font> is true if the value of the v1 is not the same as the value of v2
```

20156
The symbol for the <I>AND</I> operator is <B>&&</B>

<I>For example:</I>

(e1 && e2) is true if both e1 and e2 are true

20157
The symbol for the <I>OR</I> operator is <B>||</B>

<I>For example:</I>

(e1 || e2) is true if either e1 or e2 are true

20158
The symbol for the <I>NOT</I> operator is <B>!</B>

<I>For example:</I>

!(e1 > e2) is true if e1 is not larger than e2

20160
struct <structure_name> {   // structure definition

   <type> <name>, <name>, ... ;   // field definition(s)

   <type> <name>, <name>, ... ;

}

<structure_name> <variable>;   // to access a variable <variable>.<name>

20162
class <class_name>   // class header (prototype)

{

  public: // accessible from anywhere where the object is visible

    <function_prototypes>

  private: // are accessible only from within other members of the same class

    <function_prototypes>

    <data_attributes>

};

20163
class <class_name>   // class header (prototype)

{

  public:

    <function_prototypes>

  protected:

    <function_prototypes>

  private:

    <function_prototypes>

    <data_attributes>

};

<class_name>::<function_name> (<parameter_list>) // member function

{   // implementation

  <declarations>

  <statements>

}

20164

```
<BR>class &lt;class_name>             <font color=green>// class header (prototype)</font>
<BR>{
<BR>  public:
<BR>    &lt;function_prototypes>
<BR>  protected:
<BR>    &lt;function_prototypes>
<BR>  private:
<BR>    &lt;function_prototypes>
<BR>    &lt;data_attributes>
<BR>};
<BR>
<BR>&lt;class_name>::&lt;function_name> ( &lt;parameter_list> )  <font color=green>// member function</font>
<BR>{                                   <font color=green>// implementation</font>
<BR>  &lt;declarations>
<BR>  &lt;statements>
<BR>}
<BR>
<b>
<BR>&lt;object_name>.&lt;function_name>(&lt;actual_parameters>);  <font color=green>// member function call</font>
</b>
```

20165

```
<BR>class &lt;class_name>             <font color=green>// class header (prototype)</font>
<BR>{
<BR>  public:
<BR><b>    &lt;class_name>       <font color=green>// Contructor</font>
<BR>    ~&lt;class_name>      <font color=green>// Destructor</font></b>
<BR>    &lt;function_prototypes>
<BR>  protected:
<BR>    &lt;function_prototypes>
<BR>  private:
<BR>    &lt;function_prototypes>
<BR>    &lt;data_attributes>
<BR>};
```

20166

```
<BR>class &lt;class_name>             <font color=green>// class header (prototype)</font>
<BR>{
<BR>  public:
<BR>    &lt;function_prototypes>
<BR>  protected:
<BR>    &lt;function_prototypes>
<BR>  private:
<BR><b>    &lt;function_prototypes></b>
<BR>    &lt;data_attributes>
<BR>};
```

20167

```
<BR><B>fileName.h</B>
<BR>
<BR>class &lt;class_name>             <font color=green>// class header (prototype)</font>
<BR>{
<BR>  public:
<BR>    &lt;function_prototypes>
<BR>  protected:
<BR>    &lt;function_prototypes>
<BR>  private:
<BR>    &lt;function_prototypes>
<BR>    &lt;data_attributes>
<BR>};
<BR>
<BR><B>fileName.cpp</B>
<BR>
<BR>#include "fileName.h"
<BR>
<BR>&lt;class_name>::&lt;function_name> ( &lt;parameter_list> )  <font color=green>// member function</font>
<BR>{                                 <font color=green>// implementation</font>
<BR>  &lt;declarations>
<BR>  &lt;statements>
```

20180
A typical declaration for an array in C++ is:

type name [size];

where <i>type</i> is a valid type (like int, float...), <i>name</i> is a valid identifier, and the <I>size</I> field (which is always enclosed in square brackets []), specifies how many of the elements the array has to contain.

(taken from http://www.cplusplus.com)

20181
To access an individual element of an array, use the name of the array name followed by the index of the element in square brackets. Array indices start at 0 and end at size-1:

array_name[index];

accesses the index'th element of array_name starting at zero. If index is 0, then the first element is accessed.

(taken from http://www.cprogramming.com)

20182
When we declare an Array, we have the possibility to assign initial values to each one of its elements by enclosing the values in braces { }

type name [size] = {value_1, value_2, ..., value_size-1} ;

           or

type name [] = {value_1, value_2, ..., value_size-1} ;

20183
A typical declaration for an array in C++ is:

type name [size];

It is also possible to declare arrays with more than one dimension by the use of multiple square brackets, one for each dimension. A declaration for a 2-dimensional array is:

type name [size][size];

(taken from http://www.cprogramming.com)

20184
An example of the prototype of using an array inside a <i>for</i> loop:

for(variable initialization; conditional; variable increment)

{

  // code

  array_name[variable];

}

20185
In order to accept arrays as parameters the only thing that we have to do when declaring the function is to specify in its parameters the element type of the array, an identifier and a pair of void brackets []. For example, the following function:

void procedure (int arg[])

accepts a parameter of type "Array of int" called arg. In order to pass to this function an array declared as:

int myarray [40];

it would be enough to write a call like this:

procedure (myarray);

(taken from http://www.cplusplus.com)

25150

```
<BR>Here are the six operators with examples:
<BR>
<BR>
<table border=0>
<TR><TD><B>Operator</B></TD><TD><B>Description</B></TD><TD><B>Example</B></TD><TD><B>Evaluation</B></TD></TR>
<TR><TD>==</TD><TD>equal</TD><TD>5 == 4</TD><TD>FALSE</TD></TR>
<TR><TD colspan=2> </TD><TD>5 == 5</TD><TD>TRUE</TD></TR>
<TR><TD>!=</TD><TD>not equal</TD><TD>5 != 4</TD><TD>TRUE</TD></TR>
<TR><TD colspan=2> </TD><TD>5 != 5</TD><TD>FALSE</TD></TR>
<TR><TD>></TD><TD>greater than</TD><TD>5 > 4</TD><TD>TRUE</TD></TR>
<TR><TD colspan=2> </TD><TD>5 > 5</TD><TD>FALSE</TD></TR>
<TR><TD>>=</TD><TD>greater than or equal </TD><TD>5 >= 4</TD><TD>TRUE</TD></TR>
<TR><TD colspan=2> </TD><TD>5 >= 5</TD><TD>TRUE</TD></TR>
<TR><TD><</TD><TD>less than</TD><TD>5 < 4</TD><TD>FALSE</TD></TR>
<TR><TD colspan=2> </TD><TD>5 < 5</TD><TD>FALSE</TD></TR>
<TR><TD><=</TD><TD>less than or equal</TD><TD>5 <= 4</TD><TD>FALSE</TD></TR>
<TR><TD colspan=2> </TD><TD>5 <= 5</TD><TD>TRUE</TD></TR>
</table>
```

25186

```
<BR>C++ Arrays are the data structures which can be used to store consecutive values of the same data types. C++ Arrays can be declared for all c++ data types viz., int, float, double, char, struct, char etc., All the values are stored in consecutive memory locations. The values can be accessed by using the position of the stored value.
<BR>
<BR>The Computer also stores C++ arrays in consecutive memory locations viz., 0,1,2 etc., This makes the C++ arrays' accessibility faster. Unlike other data structures like Linked list, queue etc., the access to the elements is very fast.
<BR>
<BR>C++ Arrays can be multi-dimensional. Most cases a maximum of 3 dimensions will suffice for programming. That too single dimension c++ arrays are the commonest.
<BR>
<BR><B>C++ Array Advantages:</B>
<UL>
        <LI>Easier to declare and use.</LI>
        <LI>Can be used with all data types.</LI>
</UL>
<BR><B>C++ Array Disadvantages:</B>
<UL>
        <LI>Fixed size data. If the number of elements stored are less than the maximum size, then the rest of the memory space goes waste.</LI>
        <LI>If the number of elements to be stored are more than the maximum size, the array cannot accommodate those new values.</LI>
</UL>
<BR><font color="#cccccc">(taken from http://www.codersource.net)</font>
```

25221

```
<BR>The switch statement is a construct that is used to replace deeply nested or chained if/else statements. Nested if/else statements arise when there are multiple alternative threads of execution based on some condition.
<BR>
<BR><I>(taken from about.com)</I>
```

30121

```
<BR>let x = 4.33 and y = 9.28
<table border=0 style="padding-left:3; padding-right:3;">
 <tr><td>((x < 5) && (y < 10))</td><td><font color=green>is true</font></td></tr>
 <tr><td>!((x < 5) && (y < 10))</td><td><font color=green>is false</font></td></tr>
 <tr><td>( !(x < 5) || !(y < 10))</td><td><font color=green>is also false <B>(DeMorgans law)</B></font></td></tr>
 <tr><td>((x >= 5) || (y >= 10))</td><td><font color=green>is also false</font></td></tr>
 <tr><td>!((x >= 5) || (y >= 10))</td><td><font color=green>is true</font></td></tr>
 <tr><td>( !(x >= 5) && !(y >= 10))</td><td><font color=green>is also true <B>(DeMorgans law)</B></font></td></tr>
 <tr><td>((x < 5) && (y < 10))</td><td><font color=green>is also true (again)</font></td></tr>
</table>
```

30124

```
<BR>cin >> a >> b;
<BR>if (b > a)
<BR>   cout << "B is smaller than A\n";
```

30126

```
<BR>cin >> a >> b;
<BR>if (a < b)
<BR>{
<BR>   cout << "A is smaller than B\n";
<BR>   cout << "The difference is " << B - A << endl;
<BR>}
```

30132

```
<BR>Now, you will see an example of a program written in two ways. The first way is not organized well while the second one is organized in a way that make it easy to read.
<BR>
<BR>// an ugly example
<font color=green>
<BR>if (a < b) {
<BR>c = a * 3;
<BR>a = b - c; } else
<BR>a = c + 5;
</font>
<BR>
<BR>// improved code
<font color=green>
<BR>if (a < b)
<BR>{
<BR>   c = a * 3;
<BR>   a = b - c;
<BR>}
<BR>else
<BR>   a = c + 5;
</font>
```

30139

```
<BR>Now, you will see an example of a program written in two ways. The first way is not organized well while the second one is organized in a way that make it easy to read.
<BR>
<BR>// confusing example
<font color=green>
<BR>if (a > 0) {
<BR>   if (b < 0) {
<BR>   a = 3 * b;
<BR>   c = a + b; } }
<BR>   else {
<BR>      a = 2 * a;
<BR>      c = b / a; }
</font>
<BR>
<BR>// improved code
<font color=green>
<BR>if (a > 0)
<BR>{
<BR>   if (b < 0)
<BR>   {
<BR>   a = 3 * b;
<BR>   c = a + b;
<BR>   }
<BR>}
<BR>else
<BR>{
<BR>   a = 2 * a;
<BR>   c = b / a;
<BR>}
</font>
```

30143

An example about deposite / withdraw money from a bank account:

// declare variables

int command;

int money;

int balance = 0;

// print command prompt

cout << "Enter command number:\n"

     << "   0 - quit\n"

     << "   1 - deposit money\n"

     << "   2 - withdraw money\n"

     << "   3 - print balance\n";

cin >> command;

// handle banking command

switch (command)

   {

   case 0: // quit code

      cout << "See you later!" << endl;

      break;

   case 1: // deposit code

      cout << "Enter deposit amount: ";

      cin >> money;

      balance = balance + money;

      break;

   case 2: // withdraw code

      cout << "Enter withdraw amount: ";

      cin >> money;

      balance = balance - money;

      break;

   case 3: // print code

      cout << "Current balance = " << balance;

      break;

   default:

      cout << "Error\n";

   }

30150

let a = 17 and b = 42

(a < b)   is true

30151

let a = 17 and b = 42

(a > b)   is false

30152

let a = 42 and b = 42

(a <= b)   is true

(a < b)   is false

(a > b)   is false

30153

let a = 17 and b = 42

(a >= b)   is false

30154

let a = 17 and b = 42

(a == b)   is false

30155

let a = 17 and b = 42

(a != b)   is true

30156

let x = 3.14 and y = 7.89

((x < 4) && (y < 8))   is true (because both halves are true)

((x > 3) && (y > 8))   is false (because second half is false)

30157

let x = 3.14 and y = 7.89

((x < 4) || (y > 8))   is true (because first half is true)

((x < 3) || (y < 8))   is true (because second half is true)

((x > 4) || (y > 8))   is false (because both halves are false)

30158

```
<BR>let a = 7 and  b = 3
<table border=0>
  <TR><TD>(a > b)</TD><TD><font color=green>is true</font></TD><TD>!(a > b)</TD><TD><font color=red>is
false</font></TD></TR>
  <TR><TD>(a <= b)  </TD><TD><font color=red>is false    </font></TD><TD>!(a <=
b)  </TD><TD><font color=green>is true</font></TD></TR>
  <TR><TD>(a == b)</TD><TD><font color=red>is false</font></TD><TD>!(a == b)</TD><TD><font color=green>is
true</font></TD></TR>
  <TR><TD>(a != b)</TD><TD><font color=green>is true</font></TD><TD>!(a != b)</TD><TD><font color=red>is
false</font></TD></TR>
</table>
```

30160

```
<BR><font color=green>// Time data structure</font>
<BR>struct Time
<BR>{
<BR>   int Hour;
<BR>   int Minute;
<BR>   int Second;
<BR>};
<BR>
<BR><font color=green>// Function to initializes Time structure</font>
<BR>void SetTime(int h, int m, int s, Time & t)
<BR>{
<BR>   <font color=green>// Save corrected time values </font>
<BR>   t.Hour = h % 24;
<BR>   t.Minute = m % 60;
<BR>   t.Second = s % 60;
<BR>}
<BR>
<BR><font color=green>// Function to initializes Hour Minute and Second</font>
<BR>void GetTime(int &h, int &m, int &s, Time t)
<BR>{
<BR>   <font color=green>// Initialize reference parameters</font>
<BR>   h = t.Hour;
<BR>   m = t.Minute;
<BR>   s = t.Second;
<BR>}
<BR>
<BR><font color=green>// Function to prints Time</font>
<BR>void PrintTime(Time t)
<BR>{
<BR>   if (t.Hour == 0) cout << "12:";
<BR>   else cout << (t.Hour % 12) << ":";
<BR>   if (t.Minute < 10) cout << "0" << t.Minute << ":";
<BR>   else cout << t.Minute << ":";
<BR>   if (t.Second < 10) cout << "0" << t.Second << ":";
<BR>   else cout << t.Second << ":";
<BR>   if (t.Hour < 12) cout << "AM\n";
<BR>   else cout << "PM\n";
<BR>}
<BR>
<BR><font color=green>// Simple main program</font>
<BR>int main()
<BR>{
<BR>   <font color=green>// Variable declarations</font>
<BR>   int Hr, Min, Sec;
<BR>   Time Now, Then;
<BR>
<BR>   <font color=green>// Usage examples</font>
<BR>   Now = SetTime(10,30,0);
<BR>   PrintTime(Now);
<BR>   GetTime(Hr, Min, Sec, Now);
<BR>   cout << Hr << " " << Min << " " << Sec << endl;
<BR>   Then = Now;
<BR>   PrintTime(Then);
<BR>
<BR>   <font color=green>// Dangerous usage examples</font>
<BR>   Now.Minute += 10;
<BR>   Then.Second = 0;
<BR>}
```

30162

```
<BR><font color=green>// Time class definition</font>
<BR>class Time
<BR>{
<BR>   <font color=green>// Function headers of visible access functions</font>
<BR>   public:
<BR>      void SetTime(int h, int m, int s);
<BR>      void GetTime(int &h, int &m, int &s);
<BR>      void PrintTime();
<BR>
<BR>   <font color=green>// Declarations of hidden data types and functions</font>
<BR>   private:
<BR>      int Hour;
<BR>      int Minute;
<BR>      int Second;
<BR>};
```

30163

```
<BR><font color=green>// Time class definition</font>
<BR>class Time
<BR>{
<BR>   <font color=green>// Function headers of visible access functions</font>
<BR>   public:
<BR>      void SetTime(int h, int m, int s);
<BR>      void GetTime(int &h, int &m, int &s);
<BR>      void PrintTime();
<BR>
<BR>   <font color=green>// Declarations of hidden data types and functions</font>
<BR>   private:
<BR>      int Hour;
<BR>      int Minute;
<BR>      int Second;
<BR>};
<BR>
<b>
<BR><font color=green>// Function to set Time</font>
<BR>void Time::SetTime(int h, int m, int s)
<BR>{
<BR>   <font color=green>// Save corrected time values </font>
<BR>   Hour = h % 24;
<BR>   Minute = m % 60;
<BR>   Second = s % 60;
<BR>}
<BR>
<BR><font color=green>// Function to set Hour Minute and Second</font>
<BR>void Time::GetTime(int &h, int &m, int &s)
<BR>{
<BR>   <font color=green>// Initialize reference parameters</font>
<BR>   h = Hour;
<BR>   m = Minute;
<BR>   s = Second;
<BR>}
<BR>
<BR><font color=green>// Function to print Time</font>
<BR>void Time::PrintTime()
<BR>{
<BR>   if (Hour == 0) cout << "12:";
<BR>   else cout << (Hour % 12) << ":";
<BR>   if (Minute < 10) cout << "0" << Minute << ":";
<BR>   else cout << Minute << ":";
<BR>   if (Second < 10) cout << "0" << Second << ":";
<BR>   else cout << Second << ":";
<BR>   if (Hour < 12) cout << "AM\n";
<BR>   else cout << "PM\n";
<BR>}
</b>
```

```
<BR><font color=green>// Time class definition</font>
<BR>class Time
<BR>{
<BR>   <font color=green>// Function headers of visible access functions</font>
<BR>   public:
<BR>      void SetTime(int h, int m, int s);
<BR>      void GetTime(int &h, int &m, int &s);
<BR>      void PrintTime();
<BR>
<BR>   <font color=green>// Declarations of hidden data types and functions</font>
<BR>   private:
<BR>      int Hour;
<BR>      int Minute;
<BR>      int Second;
<BR>};
<BR>
<BR><font color=green>// Function to set Time</font>
<BR>void Time::SetTime(int h, int m, int s)
<BR>{
<BR>   <font color=green>// Save corrected time values </font>
<BR>   Hour = h % 24;
<BR>   Minute = m % 60;
<BR>   Second = s % 60;
<BR>}
<BR>
<BR><font color=green>// Function to set Hour Minute and Second</font>
<BR>void Time::GetTime(int &h, int &m, int &s)
<BR>{
<BR>   <font color=green>// Initialize reference parameters</font>
<BR>   h = Hour;
<BR>   m = Minute;
<BR>   s = Second;
<BR>}
<BR>
<BR><font color=green>// Function to print Time</font>
<BR>void Time::PrintTime()
<BR>{
<BR>   if (Hour == 0) cout << "12:";
<BR>   else cout << (Hour % 12) << ":";
<BR>   if (Minute < 10) cout << "0" << Minute << ":";
<BR>   else cout << Minute << ":";
<BR>   if (Second < 10) cout << "0" << Second << ":";
<BR>   else cout << Second << ":";
<BR>   if (Hour < 12) cout << "AM\n";
<BR>   else cout << "PM\n";
<BR>}
<BR>
<b>
<BR><font color=green>// Simple main program</font>
<BR>int main()
<BR>{
<BR>   <font color=green>// Object declaration</font>
<BR>   int Hr, Min, Sec;
<BR>   Time Now, Later;
<BR>
<BR>   <font color=green>// Object usage examples</font>
<BR>   Now.SetTime(10,45,0);
<BR>   Now.PrintTime();
<BR>   Now.GetTime(Hr, Min, Sec);
<BR>   cout << Hr << " " << Min << " " << Sec << endl;
<BR>   Later.SetTime(11,15,0);
<BR>   Later.PrintTime();
<BR>
<BR>   <font color=green>// Illegal object usage examples</font>
<BR>   Now.Hour = 12;
<BR>   cout << Later.Second << endl;
<BR>}
</b>
```

30165

```
<BR><font color=green>// Time class definition</font>
<BR>class Time
<BR>{
<BR>   <font color=green>// Function headers of visible access functions</font>
<BR>   public:
<BR>      Time();
<BR>      void SetTime(int,int,int);
<BR>      void PrintTime();
<BR>
<BR>   <font color=green>// Declarations of hidden data types and functions</font>
<BR>   private:
<BR>      int Hour;
<BR>      int Minute;
<BR>      int Second;
<BR>};
<BR>
<BR><font color=green>// Class constructor</font>
<BR>Time::Time()
<BR>{
<BR>   Hour = 0;
<BR>   Minute = 0;
<BR>   Second = 0;
<BR>}
<BR>
<BR><font color=green>// Simple main program</font>
<BR>int main()
<BR>{
<BR>   <font color=green>// Object declaration</font>
<BR>   Time Before, After;
<BR>
<BR>   <font color=green>// Object usage</font>
<BR>   Before.PrintTime();   <font color=green>// this will print 0 0 0 </font>
<BR>   After.SetTime(10,20,30);
<BR>   After.PrintTime();   <font color=green>// this will print 10 20 30</font>
<BR>   Before = After;
<BR>   Before.PrintTime();   <font color=green>// this will print 10 20 30</font>
<BR>}
```

30166

```
<BR><font color=green>// Time class definition</font>
<BR>class Time
<BR>{
<BR>   <font color=green>// Function headers of visible access functions</font>
<BR>   public:
<BR>      void SetTime(int h, int m, int s);
<BR>      void GetTime(int &h, int &m, int &s);
<BR>      void PrintTime();
<BR>
<BR>   <font color=green>// Declarations of hidden data types and functions</font>
<BR>   private:
<BR>      int Hour;
<BR>      int Minute;
<BR>      int Second;
<b><BR>      void AddOneDay(int h, int m, int s);   <font
color=green>// Declarations of a hidden function</font></b>
<BR>};
```

30167
<B>Trach.h</B>

class Track {

  Float_t fEnergy;

  Float_t fMass;

  Float_t fMomentum;

  Float_t GetEnergy();

  void SetEnergy(Float_t energy);

};

<B>Track.cpp</B>

#include "Track.h"

  Float_t Track::GetEnergy() {

    return fEnergy;

  }

  void Track::SetEnergy(Float_t energy) {

    fEnergy = energy;

    fMomentum = sqrt(fEnergy*fEnergy - fMass*fMass);

  }

30180
For example data on the average temperature over the year in Britain for each of the last 100 years could be stored in an array declared as follows:

float annual_temp[100];

This declaration will cause the compiler to allocate space for 100 consecutive float variables in memory. The number of elements in an array must be fixed at compile time. It is best to make the array size a constant and then, if required, the program can be changed to handle a different size of array by changing the value of the constant,

const int NE = 100;

float annual_temp[NE];

then if more records come to light it is easy to amend the program to cope with more values by changing the value of NE. This works because the compiler knows the value of the constant NE at compile time and can allocate an appropriate amount of space for the array. It would not work if an ordinary variable was used for the size in the array declaration since at compile time the compiler would not know a value for it.

Examples of incorrect declarations are:

int num = 30;

float data[num];

int list[31.75];

30181
An example of valid access is:

const int SIZE = 100;

float data[SIZE];

data[31] = 7;

total = total + data[20];

Examples of invalid access are:

data[4.3] = 28;

data[-8] = 0.0;

data[200] ++;

30182
Valid examples:

const int SIZE = 10;

int value[SIZE] = {3,1,4,1,5,9,2,6,5,3};

char name[SIZE] = {'J', 'O', 'H', 'N'};

float scores[] = {93.5, 92.0, 90.1, 85.7, 83.3, 76.5};

int copy[SIZE] = value;

Invalid examples:

float data[20] = scores;

int value[5] = {2,1,4,1,5,1,6};

30183

```
<br/><font color=green>// Array declaration</font>
<br/>const int rows = 24;
<br/>const int cols = 80;
<br/>char screen[rows][cols];
<br/>int matrix[3][3] = { {1,0,0}, {0,1,0}, {0,0,1} };
<br/>
<br/><font color=green>// Array assignment</font>
<br/>for (int r = 0; r < rows; r++)
<br/>  for (int c = 0; c < cols; c++)
<br/>    screen[r][c] = ' ';
<br/>
<br/><font color=green>// Array parameter declaration</font>
<br/>void print_data(char data[rows][cols])
<br/>{
<br/>  for (int r = 0; r < rows; r++)
<br/>    for (int c = 0; c < cols; c++)
<br/>      cout << data[r][c];
<br/>}
<br/>
<br/><font color=green>// Array parameter usage</font>
<br/>print_data(screen);
```

30184

```
<BR>The following code finds the average temperature recorded in the first ten elements of the array.
<BR>
<BR><font color=green>sum = 0.0;
<BR>for (i = 0; i <10; i++)
<BR>  sum += annual_temp[i];
<BR>av1 = sum / 10;</font>
<BR>
<BR>Notice that it is good practice to use named constants, rather than literal numbers such as 10. If the program is changed to take the average of the first 20 entries, then it all too easy to forget to change a 10 to 20. If a const is used consistently, then changing its value will be all that is necessary.
<BR>
<BR>For example, the following example finds the average of the last k entries in the array. k could either be a variable, or a declared constant. Observe that a change in the value of k will still calculate the correct average (provided k<=NE).
<BR>
<BR><font color=green>sum = 0.0;
<BR>for (i = NE - k; i < NE; i++)
<BR>  sum += annual_temp[i];
<BR>av2 = sum / k;</font>
<BR>
<BR><font color="#cccccc">(taken from http://www.cee.hw.ac.uk)</font>
```

30185

```
<BR><font color=green>// arrays as parameters</font>
<BR>#include &lt;iostream>
<BR>using namespace std;
<BR>
<BR>void printarray (int arg[], int length) {
<BR>  for (int n=0; n&lt;length; n++)
<BR>    cout << arg[n] << " ";
<BR>  cout << "\n";
<BR>}
<BR>
<BR>int main ()
<BR>{
<BR>  int firstarray[] = {5, 10, 15};
<BR>  int secondarray[] = {2, 4, 6, 8, 10};
<BR>  printarray (firstarray,3);
<BR>  printarray (secondarray,5);
<BR>  return 0;
<BR>}</font>
<BR>
<BR>The output is:
<font color=blue>
<BR>5 10 15
<BR>2 4 6 8 10</font>
<BR>
<BR><font color="#cccccc">(taken from http://www.cplusplus.com)</font>
```

30188

```
<br/><font color=green>// Searching example</font>
<br/>float special = 42;
<br/>float minimum = value[0];
<br/>float maximum = value[0];
<br/>for (int pos = 0; pos < SIZE; pos++)
<br/>{
<br/>  <font color=green>// Check for new minimum</font>
<br/>  if (value[pos] < minimum)
<br/>    minimum = value[pos];
<br/>
<br/>  <font color=green>// Check for new maximum</font>
<br/>  if (value[pos] > maximum)
<br/>    maximum = value[pos];
<br/>
<br/>  <font color=green>// Check for special value</font>
<br/>  if (value[pos] == special)
<br/>    cout << "found special value\n";
<br/>}
```

30189

```
<br/><font color=green>// Recursive binary search</font>
<br/>int search(int desired, int data[], int min, int max)
<br/>{
<br/>  int mid = (min + max ) / 2;
<br/>
<br/><font color=green>  // Terminating condition</font>
<br/>  if (max < min)
<br/>    return -1;
<br/>
<br/><font color=green>  // Found the value</font>
<br/>  else if (data[mid] == desired)
<br/>    return(mid);
<br/>
<br/><font color=green>  // Search recursively</font>
<br/>  else if (data[mid] < desired)
<br/>    return( search(desired, data, mid+1, max) );
<br/>  else if (data[mid] > desired)
<br/>    return( search(desired, data, min, mid-1) );
<br/>}
<br/>
<br/><font color=green>// Iterative binary search</font>
<br/>int search(int desired, int data[], int min, int max)
<br/>{
<br/>  int mid = (min + max) / 2;
<br/>
<br/><font color=green>  // Search array using divide and conquer</font>
<br/>  while ((data[mid] != desired) && (max >= min))
<br/>  {
<br/>    if (data[mid] < desired)
<br/>      min = mid+1;
<br/>    else if (data[mid] > desired)
<br/>      max = mid-1;
<br/>    mid = (min + max) / 2;
<br/>  }
<br/>
<br/><font color=green>  // Return results of search</font>
<br/>  if (data[mid] == desired)
<br/>    return(mid);
<br/>  else
<br/>    return -1;
<br/>}
```

30190

```
<br/><font color=green>// Selection sort example</font>
<br/>void sort(int data[], int size)
<br/>{
<br/>  for (int index = 0; index < size; index++)
<br/>  {
<br/><font color=green>    // Find smallest value in unsorted part</font>
<br/>    int small_pos = index;
<br/>    for (int pos = index; pos < size; pos++)
<br/>      if (data[pos] < data[small_pos])
<br/>    small_pos = pos;
<br/>
<br/><font color=green>    // Swap value to end of sorted part</font>
<br/>    int small_val = data[small_pos];
<br/>    data[small_pos] = data[index];
<br/>    data[index] = small_val;
<br/>    cout << data[index] << endl;
<br/>  }
<br/>}
<br/>
<br/>const int SIZE = 10;
<br/>int data[SIZE] = {3,1,4,1,5,9,2,6,5,3};
<br/>sort(data, SIZE);
```

30191

```
<br/><font color=green>// Median example</font>
<br/>const int SIZE = 11;
<br/>int data[SIZE] = {3,1,4,1,5,9,2,6,5,3,5};
<br/>sort(data, SIZE);    <font color=green>// the sort Function takes an array and sorts it</font>
<br/>int median = data[5];
```

35121

```
<UL>
  <LI>NOT operator on complex expression has following effect</LI>
  <LI>!(e1 && e2) is logically the same as (!e1 || !e2)</LI>
  <LI>!(e1 || e2) is logically the same as (!e1 && !e2)</LI>
  <LI>where e1 and e2 are simple logical expressions</LI>
  <LI>hence there are many ways to express the same condition</LI>
</UL>

<table border=0 cellpadding="1" cellspacing="1" style="padding-left:10; padding-right:10; padding-top:5">
 <tr
align=center><td><B> e1 </B></td><td><B> e2 </B></td><td><B> !e1 </B></td><td><B
> !e2 </B></td><td><B> (e1 &amp;&amp; e2) </B></td><td><B> (!e2 ||
!e2)</B> </td><td><B> (e1 || e2) </B></td><td><B> (!e1 &amp;&amp; !e2) </B></td></tr>
 <tr align=center><td>T</td><td>T</td><td>F</td><td>F</td><td>T</td><td>F</td><td>T</td><td>F</td></tr>
 <tr align=center><td>T</td><td>F</td><td>F</td><td>T</td><td>F</td><td>T</td><td>T</td><td>F</td></tr>
 <tr align=center><td>F</td><td>T</td><td>T</td><td>F</td><td>F</td><td>T</td><td>T</td><td>F</td></tr>
 <tr align=center><td>F</td><td>F</td><td>T</td><td>T</td><td>F</td><td>T</td><td>F</td><td>T</td></tr>
</table>
```

35138

The if statement evaluates the expression enclosed in parentheses. The expression must be of arithmetic or pointer type, or it must be of a class type that defines an unambiguous conversion to an arithmetic or pointer type.

In both forms of the if syntax, if the expression evaluates to a nonzero value (true), the statement dependent on the evaluation is executed; otherwise, it is skipped.

In the if...else syntax, the second statement is executed if the result of evaluating the expression is zero.

The else clause of an if...else statement is associated with the closest previous if statement that does not have a corresponding else statement. The following code fragment demonstrates how this works:

if(condition1 == true)

   if(condition2 == true)

      cout << "condition1 true; condition2 true\n";

   else

      cout << "condition1 true; condition2 false\n";

else

   cout << "condition 1 false\n";

Many programmers use curly braces ({ }) to explicitly clarify the pairing of complicated if and else clauses, such as in the following example:

if(condition1 == true)

{

   if(condition1 == true)

      cout << "condition1 true; condition2 true\n";

   else

      cout << "condition1 true; condition2 false\n";

}

else

   cout << "condition 1 false\n";

Although the braces are not strictly necessary, they clarify the pairing between if and else statements.

<I>(taken from http://msdn.microsoft.com/)</I>

```
<BR>The C++ switch statement allows selection among multiple sections of code, depending on the value of an expression. The expression enclosed in parentheses, the controlling expression, must be of an integral type or of a class type for which there is an unambiguous conversion to integral type.
<BR>
<BR>The switch statement causes an unconditional jump to, into, or past the statement that is the switch body, depending on the value of the controlling expression, the values of the case labels, and the presence or absence of a default label. The switch body is normally a compound statement (although this is not a syntactic requirement). Usually, some of the statements in the switch body are labeled with case labels or with the default label. Labeled statements are not syntactic requirements, but the switch statement is meaningless without them. The default label can appear only once.
<BR>
<BR><B>Syntax:</B>
<BR>
<font color=green>
<BR>case constant-expression : statement
<BR>default : statement
</font>
<BR>
<BR>The constant-expression in the case label is converted to the type of the controlling expression and is then compared for equality. In a given switch statement, no two constant expressions in case statements can evaluate to the same value.
<BR>
<BR><B>Condition Action:</B>
<OL>
        <LI>Converted value matches that of the promoted controlling expression. Control is transferred to the statement following that label.</LI>
  <LI>None of the constants match the constants in the case labels; default label is present. Control is transferred to the default label.</LI>
  <LI>None of the constants match the constants in the case labels; default label is not present. Control is transferred to the statement after the switch statement.</LI>
</OL>
An inner block of a switch statement can contain definitions with initializations as long as they are reachable that is, not bypassed by all possible execution paths. Names introduced using these declarations have local scope. The following code fragment shows how the switch statement works:
<BR>
<font color=green>
<BR>switch( tolower( *argv[1] ) )
<BR>{
<BR>   // Error. Unreachable declaration.
<BR>   char szChEntered[] = "Character entered was: ";
<BR>
<BR>case 'a' :
<BR>   {
<BR>   // Declaration of szChEntered OK. Local scope.
<BR>   char szChEntered[] = "Character entered was: ";
<BR>   cout << szChEntered << "a\n";
<BR>   }
<BR>   break;
<BR>
<BR>case 'b' :
<BR>   // Value of szChEntered undefined.
<BR>   cout << szChEntered << "b\n";
<BR>   break;
<BR>
<BR>default:
<BR>   // Value of szChEntered undefined.
<BR>   cout << szChEntered << "neither a nor b\n";
<BR>   break;
<BR>}
</font>
<BR>
<BR>A switch statement can be nested. In such cases, case or default labels associate with the most deeply nested switch statements that enclose them. For example:
<BR>
<font color=green>
<BR>switch( msg )
<BR>{
<BR>case WM_COMMAND:      // Windows command. Find out more.
<BR>   switch( wParam )
<BR>   {
<BR>   case IDM_F_NEW:   // File New menu command.
<BR>      delete wfile;
<BR>      wfile = new WinAppFile;
<BR>      break;
<BR>   case IDM_F_OPEN:  // File Open menu command.
<BR>      wfile->FileOpenDlg();
<BR>      break;
<BR>   ...
<BR>   }
<BR>case WM_CREATE:       // Create window.
<BR>   ...
<BR>   break;
<BR>case WM_PAINT:        // Window needs repainting.
<BR>   ...
<BR>   break;
<BR>default:
<BR>   return DefWindowProc( hWnd, Message, wParam, lParam );
<BR>}
</font>
<BR>
```

35156

<I>AND</I> returns TRUE if both inputs are TRUE <I>(if 'this' AND 'that' are true)</I>.
<UL>
<LI>(1) AND (0) would evaluate to zero because one of the inputs is false (both must be TRUE for it to evaluate to TRUE).</LI>
<LI>(1) AND (1) evaluates to one. (any number but 0) AND (0) evaluates to 0.</LI>
</UL>

The <I>AND</I> operator is written && in C++. Do not be confused by thinking it checks equality between numbers: it does not. Keep in mind that the <I>AND</I> operator is evaluated before the <I>OR</I> operator.

<I>(taken from http://www.cprogramming.com/)</I>

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Very useful is the <I>OR</I> statement! If either (or both) of the two values it checks are TRUE then it returns TRUE.
<UL>
<LI>(1) OR (0) evaluates to one.</LI>
<LI>(0) OR (0) evaluates to zero.</LI>
</UL>

The <I>OR</I> is written as || in C++. Those are the pipe characters. On your keyboard, they may look like a stretched colon. On my computer the pipe shares its key with \. Keep in mind that <I>OR</I> will be evaluated after <I>AND</I>.

<I>(taken from http://www.cprogramming.com/)</i>

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The NOT operator accepts one input. If that input is TRUE, it returns FALSE, and if that input is FALSE, it returns TRUE.
<UL>
<LI>NOT (0) evalutes to one.</LI>
<LI>NOT (1) evalutes to zero.</LI>
<LI>NOT (any number but zero) evaluates to zero.</LI>
</UL>

In C and C++ NOT is written as !. <I>NOT</I> is evaluated prior to both <I>AND</I> and <I>OR</I>.

<I>(taken from http://www.cprogramming.com/)</I>

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A mathematical entity consisting of a set of values (the carrier set) and a collection of operations that manipulate them. For example, the Integer abstract data type consists of a carrier set containing the positive and negative whole numbers and 0, and a collection of operations manipulating these values, such as addition, subtraction, multiplication, equality comparison, and order comparison. See also Abstract algebra.

<B>Abstraction</B>

To abstract is to ignore some details of a thing in favor of others. Abstraction is important in problem solving because it allows problem solvers to focus on essential details while ignoring the inessential, thus simplifying the problem and bringing to attention those aspects of the problem involved in its solution. Abstract data types are important in computer science because they provide a clear and precise way to specify what data a program must manipulate, and how the program must manipulate its data, without regard to details about how data are represented or how operations are implemented. Once an abstract data type is understood and documented, it serves as a specification that programmers can use to guide their choice of data representation and operation implementation, and as a standard for ensuring program correctness.

A realization of an abstract data type that provides representations of the values of its carrier set and algorithms for its operations is called a data type. Programming languages typically provide several built-in data types, and usually also facilities for programmers to create others. Most programming languages provide a data type realizing the Integer abstract data type, for example. The carrier set of the Integer abstract data type is a collection of whole numbers, so these numbers must be represented in some way. Programs typically use a string of bits of fixed size (often 32 bits) to represent Integer values in base two, with one bit used to represent the sign of the number. Algorithms that manipulate these strings of bits implement the operations of the abstract data type. See also Algorithm; Programming languages.

Realizations of abstract data types are rarely perfect. Representations are always finite, while carrier sets of abstract data types are often infinite. Many individual values of some carrier sets (such as real numbers) cannot be precisely represented on digital computers. Nevertheless, abstract data types provide the standard against which the data types realized in programs are judged.

<B>Usefulness</B>

Such specifications of abstract data types provide the basis for their realization in programs. Programmers know which data values need to be represented, which operations need to be implemented, and which constraints must be satisfied. Careful study of program code and the appropriate selection of tests help to ensure that the programs are correct. Finally, specifications of abstract data types can be used to investigate and demonstrate the properties of abstract data types themselves, leading to better understanding of programs and ultimately higher-quality software. See also Computer programming; Software engineering; Shrink fit.

<B>Relation to object-oriented paradigm</B>

A major trend in computer science is the object-oriented paradigm, an approach to program design and implementation using collections of interacting entities called objects. Objects incorporate both data and operations. In this way they mimic things in the real world, which have properties (data) and behaviors (operations). Objects that hold the same kind of data and perform the same operations form a class.

Abstract data values are separated from abstract data type operations. If the values in the carrier set of an abstract data type can be reconceptualized to include not only data values but also abstract data type operations, then the elements of the carrier set become entities that incorporate both data and operations, like objects, and the carrier set itself is very much like a class. The object-oriented paradigm can thus be seen as an outgrowth of the use of abstract data types. See also Object-oriented programming.

(taken from www.answers.com)

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A class is an expanded concept of a data structure: instead of holding only data, it can hold both data and functions.

An object is an instantiation of a class. In terms of variables, a class would be the type, and an object would be the variable.

Classes are generally declared using the keyword class, with the following format:

class class_name { access_specifier_1:   member1; access_specifier_2:   member2; ... } object_names;Where class_name is a valid identifier for the class, object_names is an optional list of names for objects of this class. The body of the declaration can contain members, that can be either data or function declarations, and optionally access specifiers.

All is very similar to the declaration on data structures, except that we can now include also functions and members, but also this new thing called access specifier. An access specifier is one of the following three keywords: private, public or protected. These specifiers modify the access rights that the members following them acquire:

<UL>
<LI>private members of a class are accessible only from within other members of the same class or from their friends.</LI>
<LI>protected members are accessible from members of their same class and from their friends, but also from members of their derived classes.</LI>
<LI>Finally, public members are accessible from anywhere where the object is visible.</LI>
</UL>

By default, all members of a class declared with the class keyword have private access for all its members. Therefore, any member that is declared before one other class specifier automatically has private access.

Once you have designed your objects, writing the C++ code is simple. The hard part is designing objects that will interact well with each other, that will do everything you need them to be able to do, but nothing more. There is almost no new syntax you need to learn to write objects in C++. It involves using the syntax for variables and functions, so make sure you understand this syntax before continuing.

Let's continue to flesh out our text-based adventure game. First, we'll write the code for our Player object. We decided that players would have the following attributes, or member data: health, strength, agility, type of weapon, and type of armor. To simplify this example, we'll just use the first three attributes. We also wanted the Player to have the following actions, or member functions: move, attack monster, and get treasure.

To write the code for our object, all we need to do is declare the member data and member functions, and wrap them up inside an object declaration. Here's how it's done:

class Player {

  int health;

  int strength;

  int agility;

  void move();

  void attackMonster();

  void getTreasure();

};

This is a completely valid, working class declaration for the Player object. All we did was declared our member data (variables for our object) and member functions (functions that our object can use), and enclosed them inside a class declaration block. The class declaration block consists of the keyword class, followed by the name of the object, in this case Player, a pair of braces, and a semi-colon.

(taken from http://www.intap.net)

A class is defined by using the keyword class followed by a programmer-specified name followed by the class definition in braces. The class definition contains the class members, its data, and the class methods, its functions. As an example, let's construct a "Dog" class that will be a model of the real world pets many of us have.

class Dog {

public:

  void setAge(int age);

  int getAge();

  void setWeight(int weight);

  int getWeight();

  void speak();

private:

  int age;

  int weight;

};

This simple example illustrates several important concepts. First, the keyword private indicates that the two members, age and weight, cannot be directly accessed from outside of the class. The keyword public indicates that the methods, setAge, getAge, setWeight, getWeight and speak, can be called from code outside of the class. That is, they may be called by other parts of a program using objects of this class. This technique of allowing access and manipulation of data members only through methods is referred to as data hiding. The interface to the class is public and the data is private. Public interface, private data is a key concept when designing classes. Data hiding will be discussed more in a later section of this article. Also, note that four of the methods, setAge, getAge, setWeight and getWeight, are involve reading or updating members of the class. Methods used to set or get members are called accessor methods or accessors.

In the above class definition, the methods are declared but not defined. That is, an implementation for each method must be written.

class Dog {

public:

  void setAge(int age);

  int getAge();

  void setWeight(int weight);

  int getWeight();

  void speak();

private:

  int age;

  int weight;

};

void Dog::setAge(int age)

{

  this->age = age;

}

int Dog::getAge()

{

  return age;

}

void Dog::setWeight(int weight)

{

  this->weight = weight;

}

int Dog::getWeight()

{

    return weight;

}

void Dog::speak()

{

  cout << "BARK!!" << endl;

}

There are a few more important things to notice here. First, since the methods are implemented outside of the class definition, they must be identified as belonging to that class. This is done with the scope resolution operator, "::". It identifies each method, for example, getAge, as belonging to the class Dog. Second, every object has a special pointer call "this", which refers to the object itself. So the members of the Dog class can be referred to as this->age or this->weight, as well as, age or weight. If there is no ambiguity, no qualification is required. So in the getWeight method, "weight" can be used instead of "this->weight". In the setWeight method an ambiguity exists. Since the parameter passed is "weight" and there is a class member "weight", the "this" pointer must be used. Finally, a note about syntax. If "this" is a pointer to a class, then the member selection operator, "->", can be used to access the contents of its members.

(taken from http://cplus.about.com)

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Just as writing a class declaration was an extension of concepts we've already covered, the same is true of the syntax needed to instantiate an object. Instantiating an object is what allows you to actually use objects in your program. You can write hundreds and hundreds of class declarations, but none of that code will be used until you create an instance of an object. A class declaration is merely a template for what an object should look like. When you instantiate an object, C++ follows the class declaration as if it were a blueprint for how to create an instance of that object.

<B>Instantiating an object</B>

The good news is, you already know how to create an instance of an object! It is exactly the same as using a variable. Let's say you want to have four players in your game, each trying to find their way to the end of a maze faster than the others. You might start by creating four instances of your Player object, like this:

Player blueHat;

Player redHat;

Player greenHat;

Player yellowHat;

It's as easy as that. Although these objects are all Players, they are completely independent of one another. They were created from the same template, but they can have different attributes. For example, "blueHat" might be a slow, strong player, while "greenHat" might be quick and weak, and "yellowHat" might be a well balanced individual, etc. The thing that makes these objects similar is that they all must have values for strength, health, and agility, but nothing else. They can all move, attack monsters, and get treasures, but that is all they can do. So -- they are similar in the kinds of things they can do and the attributes they must have, but they are different in that they can each have their own values for those attributes.

<B>Using an object's member functions</B>

Now that we can create objects, we need to know how to use them. That is, we need to be able to use their member functions. Calling an object's member functions is similar to calling a regular function, with a slight twist.

Suppose someone is playing your adventure game, and they are controlling the player with the green hat. When the person hits the key to attack a monster, you need to make sure that the correct code gets executed so that the right player attacks the monster. The code would look like this:

greenHat.attackMonster();

It's very similar to the way that a regular function is called, preceeded by the name of the object on which the function should be called (greenHat), and a period. So, instead of calling the function attackMonster(), we are telling greenHat to call the function attackMonster. This is the power of C++. You can very easily "delegate responsibility" to the objects you've written, so that what seems like an impossible task, writing a video game, becomes much more manageable.

Now let's suppose that greenHat picks up a treasure. Somewhere in your program, the following will get executed:

greenHat.getTreasure();

This will cause the function getTreasure to be executed for the player with the green hat only. The other players in the game will not execute this function. Perhaps you write getTreasure to look like this:

void Player::getTreasure() {

  health++;   // increments the value of the player's health by one

}

Suppose that before greenHat picked up the treasure, the following were the players' values for their healths:

blueHat: 14

redHat: 11

yellowHat: 8

greenHat: 11

After greenHat picked up the treasure, the values would be:

blueHat: 14

redHat: 11

yellowHat: 8

greenHat: 12

Notice that only greenHat's health increased when the function Player::getTreasure was called; that's because the member function was called on greenHat only.

(taken from http://www.intap.net)

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In addition to all of the member functions you'll create for your objects, there are two special kinds of functions that you should create for every object. They are called constructors and destructors. Constructors are called every time you create an object, and destructors are called every time you destroy an object.

<B>Constructors</B>

The constructor's job is to set up the object so that it can be used. Remember in Chapter 3.2, when we first declared a variable? Before we initialized the variable, it stored a garbage value. We needed to initialize the variable to 0 or to some other useful value before using it. The same is true of objects. The difference is that with an object, you can't just assign it a value. You can't say:

Player greenHat = 0;

because that doesn't make sense. A player is not a number, so you can't just set it to 0. The way object initialization happens in C++ is that a special function, the constructor, is called when you instantiate an object. The constructor is a function whose name is the same as the object, with no return type (not even void). For our video game, we'll probably want to initialize our Players' attributes so that they don't contain garbage values. We might decide to write the constructor like this:

Player::Player() {

  strength = 10;

  agility = 10;

  health = 10;

}

We would also have to change the class declaration so that it looks like this:

class Player {

  int health;

  int strength;

  int agility;

  Player();   // constructor - no return type

  void move();

  void attackMonster();

  void getTreasure();

};

One problem with this constructor is that all of the players will be initialized to have strength=10, agility=10, and health=10. We might want to create players with different values for strength and agility to make our game more interesting. So, we can add a second constructor, which has parameters for strength and agility. Our class declaration would now look like this:

class Player {

  int health;

  int strength;

  int agility;

  Player();   // constructor - no return type

  Player(int s, int a);   // alternate constructor takes two parameters

  void move();

  void attackMonster();

  void getTreasure();

};

and we would add a function definition for the alternate constructor, which looks like this:

Player::Player(int s, int a) {

  strength = s;

  agility = a;

  health = 10;

}

Now, when we want to instantiate the Player object four times, we can do the following:

Player redHat;   // default constructor

Player blueHat(14, 7);   // alternate constructor

Player greenHat(6, 12);   // alternate constructor

Player yellowHat(10, 10);   // alternate constructor

<B>Destructors</B>

Destructors are less complicated than constructors. You don't call them explicitly (they are called automatically for you), and there's only one destructor for each object. The name of the destructor is the name of the class, preceeded by a tilde (~). Here's an example of a destructor:

Player::~Player() {

  strength = 0;

  agility = 0;

  health = 0;

}

(taken from http://www.intap.net)

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Assumming the following example of a class declaration:

class Player {

  int health;

  int strength;

  int agility;

  void move();

  void attackMonster();

  void getTreasure();

};

Although this is perfectly legal C++, we left out an important part of class declarations to simplify the example. Every data member and member function in a class is either private, public, or protected. We'll explain the meaning of each:

<B>Private </B>

Specifying that a data member or member function is private means that it can only be accessed from within the class. For data members, this means that the data can be accessed or modified only while inside a member function of the class. For member functions, this means that the function can be called only while inside another member function of the class. This is the default, if no specifiers are used.

<B>Public</B>

Specifying that a data member or member function is public means that it can be accessed from anywhere in your code. The public specifier is less restrictive than private.

<B>Protected</B>

Specifying that a data member or member function is protected means that it can only be accessed from within the class or a subclass. We haven't yet talked about subclasses (Section 10), so don't worry about using protected just yet. The protected specifier is less restrictive than private but more restrictive than public.

<B>How do I use these specifiers?</B>

Using private, public, and protected are easy. The specifier affects all data members and member functions until the next occurrence of a specifier. Here's the Player class, with protection specifiers added:

class Player {

private:

  int health;

  int strength;

  int agility;

public:

  void move();

  void attackMonster();

  void getTreasure();

};

In this example, the private keyword begins a private section encompassing the three data members. The public keyword specifies that the next three member functions should be public. So, only code which is in a Player member function can access the data members, while any code in the program is free to call the member functions in the Player class.

<B>Why bother with this stuff?</B>

Specifiers allow a class to be very complex, with many member functions and data members, while having a simple public interface that other classes can use. A class which has two hundred data members and one hundred member functions can be very complicated to write; but if there are only three or four public member functions, and the rest are all private, it can be easy for someone to learn how to use the class. He only needs to understand how to use a small handful of public functions, and doesn't need to bother with the two hundred data members, because he's not allowed to access this data. He can only access the private data through the class' public interface. Without a doubt, in a small program, using these specifiers may seem unnecessary. However, they are worth understanding if you plan to do any program of reasonable size (more than a couple hundred lines). In general, it is good practice to make data members private. Member functions which must be called from outside the class should be public, and member functions which are only called from within the class (also known as "helper functions") should probably be private. These specifiers are especially useful in a large program involving more than one programmer.

(taken from http://www.intap.net)

So far our Track class is just a few lines of code, but most real classes are much larger. Then typically the source code for a class is divided into 2 files. For example MyClass:-

<I>MyClass.h - the header file

MyClass.cxx - the implementation file </I>

The header file provides the compiler with:
<UL>
<LI>The names and types of all member functions and data members</LI>
<LI>The names of all the classes from which the class inherits</LI>
</UL>
The implementation file contains the member function code. So, a class's header file loosely corresponds to its abstraction while the implementation file corresponds to its encapsulation.

If we were to divide out our Track class into two files then Track.h would contain:-

class Track {

  Float_t fEnergy;

  Float_t fMass;

  Float_t fMomentum;

  Float_t GetEnergy();

  void SetEnergy(Float_t energy);

};

i.e. a declaration of all its data and functions, but no function code. Track.cxx would contain:-

#include "Track.h"

  Float_t Track::GetEnergy() {

    return fEnergy;

  }

  void Track::SetEnergy(Float_t energy) {

    fEnergy = energy;

    fMomentum = sqrt(fEnergy*fEnergy - fMass*fMass);

  }

Note that the function names have a preceding Track::. :: is called the scoping operator: Track:: means "is a member of Track". This was implied when the function appears inside the class statement (indeed there Track:: would mean Track::Track:: !), but has to be explicitly stated when outside. Note also that the implementation file has to include the header file as it has to know how the class is defined.

To complie more than one file together, do the following steps:

Link main.o and time.o to create main.exe

time.exe: time.o main.o

   g++ -o time.exe time.o main.o

Compile time.cpp to create time.o

time.o: time.cpp time.h

   g++ -c time.cpp

Compile main.cpp to create main.o

main.o: main.cpp

   g++ -c main.cpp

(taken from http://www.intap.net)

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```
<BR><B>Declaring C++ Arrays of int type:</B>
<BR>
<BR>The c++ arrays are declared with the data type name and the number of elements inside the square brackets.
<BR>
<font color=green>
<BR>int var_name[50];    // C++ Array of type int with maximum size = 50.</font>
<BR>
<BR>The above declaration means, the var_name is an array of integer type. The values inside this var_name array can be accessed by referring to the position of their elements like var_name[0], var_name[1] etc.,
<BR>
<BR>All the C++ arrays are based on Zero index values. That means the position reference starts at 0 and counts till the n-1th position. So in the above array, 50 elements can be stored starting from 0 to 49. The maximum number of elements that can be stored or the maximum size of the c++ array is 50. The values can be stored and accessed as given in the following code snippet.
<BR>
<font color=green>
<BR>var_name[0] = 0;
<BR>var_name[1] = 1;
<BR>var_name[2] = 30;
<BR>
<BR>printf("Position 0: %d, Position 1:%d, Position 2:%d\n", var_name[0], var_name[1], var_name[2]);</font>
<BR>
<BR>Care should be taken while using or referring to the position of the element. The position reference should not exceed the maximum size specified in the declaration. If it exceeds, the program will not generate any compiler errors. But it will raise run time errors and exceptions.
<BR>
<BR>Declaration of a two dimensional array is also similar. A great example for a two dimensional c++ integer array will be matrix.
<BR>
<font color=green>
<BR>int array_matrix[3][3];    //Matrix of 3 * 3 type using c++ array of int data type</font>
<BR>
<BR><B>Declaring C++ arrays of type float:</B>
<BR>
<BR>The declaration and use of c++ arrays in float type are the same as int. The declaration is written as follows.
<BR>
<font color=green>
<BR>float var_float[100];    //A c++ array of float type</font>
<BR>
<BR>The above declaration means, the c++ float array contains 100 elements starting from position 0 till 99. The elements can be accessed as var_float[0], var_float[1], var_float[2] .. var_float[99].
<BR>
<font color=green>
<BR>var_float[0] = 10.05;
<BR>var_float[1] = 11.04;
<BR>var_float[99] = 87.65;</font>
<BR>
<BR><B>Declaring C++ arrays of type char:</B>
<BR>
<BR>This is one of the most widely used and problematic type of c++ array. When an array of char is declared, this char array can be used as a string with the maximum size as specified in the array declaration. When this c++ char array is declared with two dimensions, this can be thought as an array of strings.
<BR>
<font color=green>
<BR>char var_char_array[50];    //Memory reserved for 50 characters
<BR>char var_char_init[] = "c++ char array string example";    // initialization without specifying the size</font>
<BR>
<BR>Like the above the c++ char array can be declared with or without initializing values.
<BR>
<BR><font color="#cccccc">(taken from http://www.codersource.net)</font>
```

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Following the previous examples in which billy had 5 elements and each of those elements was of type int.

For example, to store the value 75 in the third element of billy, we could write the following statement:

billy[2] = 75;

and, for example, to pass the value of the third element of billy to a variable called a, we could write:

a = billy[2];

Therefore, the expression billy[2] is for all purposes like a variable of type int.

Notice that the third element of billy is specified billy[2], since the first one is billy[0], the second one is billy[1], and therefore, the third one is billy[2]. By this same reason, its last element is billy[4]. Therefore, if we write billy[5], we would be accessing the sixth element of billy and therefore exceeding the size of the array.

In C++ it is syntactically correct to exceed the valid range of indices for an Array. This can create problems, since accessing out-of-range elements do not cause compilation errors but can cause runtime errors. The reason why this is allowed will be seen farther ahead when we begin to use pointers.

At this point it is important to be able to clearly distinguish between the two uses that brackets [ ] have related to arrays. They perform two different tasks: one is to specify the size of arrays when they are declared; and the second one is to specify indices for concrete array elements. Do not confuse these two possible uses of brackets [ ] with arrays.

int billy[5];   // declaration of a new Array

billy[2] = 75;   // access to an element of the Array.

If you read carefully, you will see that a type specifier always precedes a variable or array declaration, while it never precedes an access.

Some other valid operations with arrays:

billy[0] = a;

billy[a] = 75;

b = billy [a+2];

billy[billy[a]] = billy[2] + 5;

(taken from http://www.cplusplus.com)

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When declaring a regular array of local scope (within a function, for example), if we do not specify otherwise, its elements will not be initialized to any value by default, so their content will be undetermined until we store some value in them. Global and static arrays, on the other hand, are automatically initialized filled with zeros.

In both cases, local and global, when we declare an Array, we have the possibility to assign initial values to each one of its elements by enclosing the values in braces { }. For example:

int billy [5] = { 16, 2, 77, 40, 12071 };

The amount of values between braces { } must not be larger than the number of elements that we declare for the array between square brackets [ ]. For example, in the example of array billy we have declared that it has 5 elements and in the list of initial values within braces { } we have specified 5 values, one for each element.

When an initialization of values is provided for an array, C++ allows the possibility of leaving the square brackets empty [ ]. In this case, the compiler will assume a size for the Array that matches the number of values included between braces { }:

int billy [] = { 16, 2, 77, 40, 12071 };

After this declaration, Array billy would be 5 ints long, since we have provided 5 initialization values.

(taken from http://www.cplusplus.com)

35183

Multidimensional arrays can be described as "arrays of arrays". For example, a bidimensional array can be imagined as a bidimensional table made of elements, all of them of a same uniform data type.

Multidimensional arrays are not limited to two indices (i.e., two dimensions). They can contain as many indices as needed. But be careful! The amount of memory needed for an array rapidly increases with each dimension. For example:

char century [100][365][24][60][60];

declares an array with a char element for each second in a century, that is more than 3 billion chars. So this declaration would consume more than 3 gigabytes of memory!

Multidimensional arrays are just an abstraction for programmers, since we can obtain the same results with a simple array just by putting a factor between its indices:

int jimmy [3][5];   is equivalent to   int jimmy [15]; // (3 * 5 = 15)

With the only difference that with multidimensional arrays the compiler remembers the depth of each imaginary dimension for us. Take as example these two pieces of code, with both exactly the same result. One uses a bidimensional array and the other one uses a simple array:

<B>1. Multidimensional array:</B>

#define WIDTH 5

#define HEIGHT 3

int jimmy [HEIGHT][WIDTH];

int n,m;

int main ()

{

  for (n=0; n<HEIGHT; n++)

    for (m=0; m<WIDTH; m++)

      jimmy[n][m]=(n+1)*(m+1);

  return 0;

}

<B>2. Pseudo-multidimensional array:</B>

#define WIDTH 5

#define HEIGHT 3

int jimmy [HEIGHT * WIDTH];

int n,m;

int main ()

{

  for (n=0; n<HEIGHT; n++)

    for (m=0; m<WIDTH; m++)

      jimmy[n*WIDTH+m]=(n+1)*(m+1);

  return 0;

}

None of the two source codes above produce any output on the screen, but both assign values to the memory block called jimmy.

We have used "defined constants" (#define) to simplify possible future modifications of the program. For example, in case that we decided to enlarge the array to a height of 4 instead of 3 it could be done simply by changing the line:

#define HEIGHT 3   to   #define HEIGHT 4

with no need to make any other modifications to the program.

(taken from http://www.cplusplus.com)

35184

Arrays are passed around as pointers. In fact, a C++ array is implemented as a pointer to the first element of the array. In practical terms it means that we can access a pointer as if it were an array--that is using an index. Conversely, we can use a pointer to access elements of an array. We can increment a pointer to move from one element of the array to the next. Of course, in both cases it is our responsibility to make sure that the pointer actually points to an element of an array.

A string is a good example of an array. There is a function in the standard library called strlen that calculates the length of a null terminated string. Let's write our own implementation of this function, which we will call StrLen

int StrLen (char const str [])

{

  int i = 0;

  for (; str [i] != '\0'; ++i)

    continue;

  return i;

}

The continue keyword is used here instead of an empty body of the loop. It's less error prone this way. The loop counter i could not be defined in the loop header because we are accessing it (returning) outside of the loop.

Here's the main procedure that passes an array to StrLen:

int main ()

{

  char aString [] = "the long string";

  int len = StrLen (aString);

  cout << "The length of " << aString << " is " << len;

}

We are scanning the string for a terminating null and returning the index of this null. Pretty obvious, isn't it?

Here's a more traditional "optimized" version:

int StrLen (char const * pStr)

{

  char const * p = pStr;

  while (*p++);

  return p - pStr - 1;

}

We initialize p to point to the beginning of the string. The while loop is a little cryptic. We dereference the pointer, test it for Boolean truth and post-increment it, all in one statement. If the character obtained by dereferencing the pointer is different from zero (zero being equivalent to Boolean false) we will continue looping. The post-increment operator moves the pointer to the next position in the array, but only after it has been used in the expression (yielding true of false).

(taken from http://www.relisoft.com)

At some moment we may need to pass an array to a function as a parameter. In C++ it is not possible to pass a complete block of memory by value as a parameter to a function, but we are allowed to pass its address. In practice this has almost the same effect and it is a much faster and more efficient operation.

Here you have a complete example:

// arrays as parameters

#include <iostream>

using namespace std;

void printarray (int arg[], int length) {

  for (int n=0; n<length; n++)

    cout << arg[n] << " ";

  cout << "\n";

}

int main ()

{

  int firstarray[] = {5, 10, 15};

  int secondarray[] = {2, 4, 6, 8, 10};

  printarray (firstarray,3);

  printarray (secondarray,5);

  return 0;

}

The output is:

5 10 15

2 4 6 8 10

As you can see, the first parameter (int arg[]) accepts any array whose elements are of type int, wathever its length. For that reason we have included a second parameter that tells the function the length of each array that we pass to it as its first parameter. This allows the for loop that prints out the array to know the range to iterate in the passed array without going out of range.

In a function declaration it is also possible to include multidimensional arrays. The format for a tridimensional array parameter is:

base_type[][depth][depth]

for example, a function with a multidimensional array as argument could be:

void procedure (int myarray[][3][4])

Notice that the first brackets [] are left blank while the following ones are not. This is so because the compiler must be able to determine within the function which is the depth of each additional dimension.

Arrays, both simple or multidimensional, passed as function parameters are a quite common source of errors for novice programmers. I recommend the reading of the chapter about Pointers for a better understanding on how arrays operate.

(taken from http://www.cplusplus.com)

APPENDIX B: HUMAN SUBJECT PERMISSION

KU RESEARCH
The University of Kansas

8/30/2006
HSCL #16142

Daniyal Alghazzawi
EECS
2030 Eaton Hall

The Human Subjects Committee Lawrence Campus (HSCL) has reviewed your research project application

16142 Alghazzawi/Gauch (EECS) Adaptive e-Learning Environments for Multiple Cognitive Learning Styles

and approved this project under the expedited procedure provided in 45 CFR 46.110 (f) (7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

Since your research presents no risk to participants and involves no procedures for which written consent is normally required outside of the research context HSCL may waive the requirement for a signed consent form (45 CFR 46.117 (c) (2). Your information statement meets HSCL requirements. The Office for Human Research Protections requires that your information statement must include the note of HSCL approval and expiration date, which has been entered on the form sent back to you with this approval.

1. At designated intervals until the project is completed, a Project Status Report must be returned to the HSCL office.
2. Any significant change in the experimental procedure as described should be reviewed by this Committee prior to altering the project.
3. Notify HSCL about any new investigators not named in original application. Note that new investigators must take the online tutorial at http://www.research.ku.edu/tutor/hsp/index.shtml.
4. Any injury to a subject because of the research procedure must be reported to the Committee immediately.
5. When signed consent documents are required, the primary investigator must retain the signed consent documents for at least three years past completion of the research activity. If you use a signed consent form, provide a copy of the consent form to subjects at the time of consent.
6. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.

Please inform HSCL when this project is terminated. You must also provide HSCL with an annual status report to maintain HSCL approval. Unless renewed, approval lapses one year after approval date. If your project receives funding which requests an annual update approval, you must request this from HSCL one month prior to the annual update. Thanks for your cooperation. If you have any questions, please contact me.

Sincerely,

David Hann

David Hann
Coordinator
Human Subjects Committee - Lawrence

cc: John Gauch

Office of the Vice Provost for Research | Research Integrity - Human Subjects Committee Lawrence
Youngberg Hall | 2385 Irving Hill Road | Lawrence, KS 66045-7563
(785) 864-7429 | Fax (785) 864-5049 | www.research.ku.edu

APPENDIX C: THE EXTRACTED FEATURES FROM THE TRACKING MECHANISM

Table 27.

The Features Extracted from the Tracking Mechanism in the First Online Lesson.

ID	LS	1	2	3	O	D	C	1	2	3	O	D	C	11	12	13	21	22	23	31	32	33	OO	OD	OC	DO	DD	DC	CO	CD	CC	CC
1	H	33	30	35	0	0	0	33	30	35	0	0	0	21	9	2	4	14	12	4	7	21	0	0	0	0	0	0	0	0	0	0
9	H	32	32	34	0	0	0	32	32	34	0	0	0	19	11	2	4	9	19	7	11	14	0	0	0	0	0	0	0	0	0	0
12	H	36	29	34	40	20	40	36	29	34	2	1	2	13	18	4	2	0	27	18	11	2	0	25	0	25	0	0	25	0	25	1
18	H	33	30	35	16	50	33	33	30	35	1	3	2	0	0	34	29	0	0	2	31	2	0	0	20	0	40	20	0	20	0	0
19	H	33	31	35	0	100	0	33	31	35	0	4	0	0	32	1	3	0	28	28	0	5	0	0	0	0	100	0	0	0	0	0
20	H	33	30	35	0	50	50	33	30	35	0	1	1	0	29	2	2	0	29	29	2	4	0	0	0	0	0	0	0	100	0	0
21	H	38	29	32	12	50	37	38	29	32	1	4	3	11	25	1	1	0	27	24	3	3	0	14	0	0	28	28	14	14	0	0
22	H	33	33	33	100	0	0	33	33	33	2	0	0	1	26	5	7	0	26	22	7	1	100	0	0	0	0	0	0	0	0	0
23	H	31	32	36	0	0	100	31	32	36	0	0	1	5	18	6	13	6	13	11	8	16	0	0	0	0	0	0	0	0	0	0
24	H	34	31	34	50	25	25	34	31	34	2	1	1	20	11	1	1	18	11	11	1	21	0	0	33	33	0	0	0	33	0	0
25	H	36	29	34	40	60	0	36	29	34	2	3	0	6	23	4	2	0	28	26	6	2	0	50	0	50	0	0	0	0	0	0
27	H	27	33	39	0	100	0	27	33	39	0	1	0	14	10	4	4	20	10	8	4	26	0	0	0	0	0	0	0	0	0	0
28	H	34	31	34	25	50	25	34	31	34	2	4	2	0	32	2	2	0	30	30	0	2	0	14	14	0	28	14	14	14	0	0
31	H	34	32	32	25	58	16	34	32	32	3	7	2	11	21	2	0	2	28	21	9	2	9	18	0	9	36	18	0	9	0	0
32	H	35	32	31	12	62	25	35	32	31	1	5	2	4	24	7	8	1	23	21	7	1	0	0	14	0	57	0	0	14	14	0
38	H	34	31	34	33	33	33	34	31	34	1	1	1	8	21	4	2	1	27	21	8	2	0	0	50	0	0	0	0	50	0	0
45	H	33	31	34	0	33	66	33	31	34	0	1	2	20	12	1	1	17	12	10	2	21	0	0	0	0	0	0	0	50	50	0
48	H	31	31	36	26	50	23	31	31	36	7	13	6	0	30	2	0	0	32	30	2	2	4	16	8	4	36	12	20	0	0	0
49	H	32	30	37	0	66	33	32	30	37	0	2	1	19	10	3	2	11	17	10	9	17	0	0	0	0	50	50	0	0	0	0
50	H	33	30	35	0	100	0	33	30	35	0	1	0	25	8	0	1	20	9	6	2	26	0	0	0	0	0	0	0	0	0	0
52	H	35	26	37	23	53	23	35	26	37	3	7	3	1	26	7	0	0	26	32	0	3	0	16	8	8	25	16	8	16	0	0
55	H	32	30	37	20	66	13	32	30	37	3	10	2	0	30	2	0	0	30	30	0	4	7	7	7	7	50	7	0	14	0	0
56	H	31	31	36	0	0	100	31	31	36	0	0	1	0	32	0	0	0	32	30	0	5	0	0	0	0	0	0	0	0	0	0
61	H	31	29	38	28	42	28	31	29	38	4	6	4	9	20	2	2	6	20	18	2	16	7	15	7	7	23	15	7	7	7	1
65	H	31	31	36	28	42	28	31	31	36	4	6	4	2	30	0	0	0	32	27	2	5	0	23	7	7	15	23	15	7	0	0
66	H	33	30	35	25	50	25	33	30	35	3	6	3	0	29	4	2	0	29	29	2	2	0	18	9	9	27	18	9	9	0	0
2	S	33	30	35	30	40	30	33	30	35	3	4	3	0	31	2	0	0	31	31	0	2	0	11	22	11	22	11	11	11	0	0
3	S	34	30	34	25	50	25	34	30	34	1	2	1	2	30	2	0	0	30	30	0	2	0	33	0	0	33	0	33	0	0	0
4	S	35	31	33	100	0	0	35	31	33	1	0	0	0	31	4	4	0	27	29	0	2	0	0	0	0	0	0	0	0	0	0
5	S	34	34	32	0	0	0	34	34	32	0	0	0	0	28	6	6	4	24	26	2	2	0	0	0	0	0	0	0	0	0	0
7	S	33	30	35	0	0	100	33	30	35	0	0	1	0	31	2	0	0	31	31	0	2	0	0	0	0	0	0	0	0	0	0
8	S	30	28	41	0	0	0	30	28	41	0	0	0	1	23	5	3	1	23	23	3	13	0	0	0	0	0	0	0	0	0	0
10	S	33	30	35	0	0	0	33	30	35	0	0	0	7	24	2	4	2	24	19	4	9	0	0	0	0	0	0	0	0	0	0
11	S	32	36	30	0	100	0	32	36	30	0	3	0	0	29	3	5	5	25	25	1	1	0	0	0	0	100	0	0	0	0	0
14	S	38	32	28	16	66	16	38	32	28	1	4	1	3	33	1	7	0	25	25	0	1	0	0	20	0	60	0	0	20	0	0
15	S	35	31	33	25	50	25	35	31	33	3	6	3	2	31	2	2	0	29	29	0	2	0	9	18	9	27	9	9	18	0	0
16	S	33	30	35	60	40	0	33	30	35	3	2	0	0	28	5	5	0	25	26	1	5	50	25	0	0	25	0	0	0	0	0
29	S	33	30	35	0	25	75	33	30	35	0	1	3	0	31	2	0	0	31	31	0	2	0	0	0	0	0	33	0	33	33	0
30	S	33	31	35	0	0	0	33	31	35	0	0	0	0	31	2	0	0	31	31	0	2	0	0	0	0	0	0	0	0	0	0
33	S	33	30	35	28	14	57	33	30	35	2	1	4	24	7	2	0	24	7	7	0	26	0	0	33	16	0	0	0	16	33	1
36	S	34	30	34	0	0	0	34	30	34	0	0	0	2	26	7	2	2	26	28	2	2	0	0	0	0	0	0	0	0	0	0
37	S	31	26	42	0	0	100	31	26	42	0	0	2	0	21	10	0	0	27	29	5	5	0	0	0	0	0	0	0	0	100	0
39	S	36	29	34	0	50	50	36	29	34	0	1	1	13	19	4	2	0	28	19	10	2	0	0	0	0	0	0	0	100	0	0
40	S	33	31	35	66	0	33	33	31	35	4	0	2	0	32	1	0	0	32	32	0	1	20	0	40	0	0	0	40	0	0	0
42	S	36	29	34	0	0	0	36	29	34	0	0	0	13	13	9	6	0	23	13	16	2	0	0	0	0	0	0	0	0	0	0
43	S	29	31	38	33	0	66	29	31	38	1	0	2	23	6	0	0	21	10	4	4	28	0	0	50	0	0	0	50	0	0	0
44	S	33	30	35	0	60	40	33	30	35	0	3	2	0	31	2	0	0	31	31	0	2	0	0	0	0	25	50	0	25	0	0
46	S	34	31	34	100	0	0	34	31	34	1	0	0	0	32	2	2	0	30	30	0	2	0	0	0	0	0	0	0	0	0	0
54	S	32	32	34	25	50	25	32	32	34	3	6	3	0	30	2	2	0	30	28	2	2	0	18	9	9	18	18	9	18	0	0
58	S	31	31	36	30	46	23	31	31	36	4	6	3	5	20	7	2	7	22	22	5	7	8	16	8	0	33	16	16	0	0	0
59	S	34	29	36	11	55	33	34	29	36	1	5	3	0	30	5	0	0	30	32	0	2	0	12	0	0	37	25	12	12	0	0
60	S	31	31	36	0	0	0	31	31	36	0	0	0	22	7	2	0	25	7	7	0	27	0	0	0	0	0	0	0	0	0	0
62	S	36	27	36	0	0	0	36	27	36	0	0	0	2	28	6	0	0	28	32	0	2	0	0	0	0	0	0	0	0	0	0
63	S	34	31	34	66	33	0	34	31	34	2	1	0	18	10	2	8	16	8	8	5	21	50	50	0	0	0	0	0	0	0	0
64	S	33	30	35	0	0	100	33	30	35	0	0	1	0	31	2	0	0	31	31	0	2	0	0	0	0	0	0	0	0	0	0
67	S	33	30	35	50	0	50	33	30	35	1	0	1	26	7	0	0	24	7	4	0	29	0	0	100	0	0	0	0	0	0	0
6	V	35	28	35	0	100	0	35	28	35	0	2	0	0	29	6	2	0	25	31	0	4	0	0	0	0	100	0	0	0	0	0
13	V	31	31	36	0	100	0	31	31	36	0	1	0	11	18	2	0	0	32	18	13	2	0	0	0	0	0	0	0	0	0	0
17	V	34	32	32	50	20	30	34	32	32	5	2	3	2	29	2	2	3	25	28	0	4	22	11	22	0	11	11	22	0	0	0
26	V	33	30	35	33	33	33	33	30	35	1	1	1	0	31	2	0	0	31	31	0	2	0	0	50	0	0	0	0	50	0	0
34	V	33	31	35	0	0	0	33	31	35	0	0	0	2	6	23	25	0	6	5	25	4	0	0	0	0	0	0	0	0	0	0
41	V	33	30	35	33	50	16	33	30	35	2	3	1	12	19	2	0	0	31	19	12	2	0	20	20	20	20	0	0	20	0	0
51	V	32	27	39	0	40	60	32	27	39	0	2	3	15	12	4	2	11	13	13	4	22	0	0	0	0	25	0	0	25	50	0
57	V	34	31	34	0	0	0	34	31	34	0	0	0	0	32	2	2	0	30	30	0	2	0	0	0	0	0	0	0	0	0	0

ID	LS	11	12	13	1O	1D	1C	21	22	23	2O	2D	2C	31	32	33	3O	3D	3C	O1	O2	O3	OO	OD	OC	D1	D2	D3	DO	DD	DC	C1	C2	D3	CO	CD	CC
1	H	21	9	2	0	0	0	4	14	12	0	0	0	4	7	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	19	11	2	0	0	0	4	9	19	0	0	0	7	11	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	12	20	2	2	0	0	2	0	30	0	0	0	17	12	2	0	0	1	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	1
18	H	0	0	35	0	0	0	27	0	0	0	1	1	2	32	2	0	0	0	1	0	0	0	0	0	0	0	0	0	2	1	1	0	0	0	0	0
19	H	0	34	2	0	0	0	4	0	30	0	0	0	28	0	2	0	3	0	0	0	0	0	0	0	1	0	2	0	1	0	0	0	0	0	0	0
20	H	0	30	2	0	0	0	2	0	28	0	1	0	28	2	5	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
21	H	12	29	0	0	1	0	2	0	27	0	2	0	22	4	2	0	1	3	1	0	0	0	0	0	0	0	4	0	0	0	1	0	0	1	0	0
22	H	1	26	5	0	0	0	5	0	26	1	0	0	23	7	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	5	18	6	0	0	0	13	6	13	0	0	0	11	6	16	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
24	H	21	12	0	0	1	0	1	19	12	0	0	0	10	0	22	1	0	1	2	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0
25	H	4	26	2	1	1	0	2	0	29	0	1	0	24	7	2	1	1	0	2	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0
27	H	14	10	4	0	0	0	4	20	8	0	1	0	8	4	26	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
28	H	0	38	2	0	0	0	2	0	33	0	1	0	22	0	0	1	3	2	1	0	1	0	0	0	3	0	1	0	0	0	2	0	0	0	0	0
31	H	11	26	0	1	1	0	0	2	26	0	4	0	17	11	2	2	1	0	3	0	0	0	0	0	1	0	3	0	1	2	0	0	1	0	0	0
32	H	3	27	6	0	2	0	8	1	22	0	2	1	20	8	1	0	1	1	1	0	0	0	0	0	2	0	3	0	0	0	2	0	0	0	0	0
38	H	8	22	4	0	0	0	2	1	28	0	0	0	19	8	2	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
45	H	21	12	1	0	0	0	1	18	11	0	1	0	9	2	22	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0
48	H	0	36	0	0	1	0	0	0	27	0	4	0	30	3	3	0	1	2	3	0	0	1	2	1	0	0	5	1	5	2	0	0	0	5	0	0
49	H	19	10	3	0	0	0	2	11	17	0	0	0	8	9	17	0	1	1	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0
50	H	25	8	0	0	0	0	1	20	9	0	0	0	6	2	25	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
52	H	0	34	7	0	2	0	0	0	21	0	5	0	31	0	4	1	0	3	3	0	0	0	0	0	1	0	6	0	0	0	2	0	0	1	0	0
55	H	0	41	0	0	1	0	0	0	25	0	5	0	29	0	3	2	1	2	2	0	0	0	1	0	1	0	7	0	2	0	2	0	0	0	0	0
56	H	0	33	0	0	0	0	0	0	33	0	0	0	28	0	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
61	H	5	26	0	2	1	0	2	8	20	0	2	0	17	2	14	0	2	3	4	0	0	0	0	0	0	0	5	0	1	0	1	0	0	1	0	1
65	H	0	42	0	1	0	0	0	0	32	0	4	0	17	3	3	2	2	4	4	0	0	0	0	0	1	0	5	0	0	0	3	0	0	0	0	0
66	H	0	37	3	0	1	0	3	0	21	0	5	0	28	3	3	1	0	3	3	0	0	0	0	0	0	0	6	0	0	0	1	0	0	1	0	0
2	S	0	35	0	1	1	0	0	0	29	0	3	0	32	0	2	0	0	3	2	1	0	0	0	0	0	0	4	0	0	0	1	0	0	1	0	0
3	S	2	34	0	0	1	0	0	0	31	0	1	0	28	0	2	1	0	1	1	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0
4	S	0	32	4	0	0	0	4	0	28	0	0	0	28	0	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	0	28	6	0	0	0	6	4	24	0	0	0	26	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	32	2	0	0	0	0	0	32	0	0	0	30	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
8	S	1	23	5	0	0	0	3	1	23	0	0	0	23	3	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	7	24	2	0	0	0	4	2	24	0	0	0	19	4	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	30	3	0	0	0	5	5	23	0	2	0	26	1	1	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
14	S	4	36	0	0	1	0	6	0	23	0	3	0	26	0	2	0	0	1	1	0	0	0	0	0	1	0	3	0	0	0	1	0	0	0	0	0
15	S	0	34	0	2	2	0	0	0	34	0	2	0	28	0	2	0	1	2	2	1	0	0	0	0	2	1	2	0	0	1	1	0	0	1	1	0
16	S	0	31	6	0	0	0	6	0	25	0	1	0	25	2	4	2	1	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
29	S	0	34	0	0	1	0	0	0	34	0	0	0	28	0	2	0	0	3	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0
30	S	0	31	2	0	0	0	0	0	31	0	0	0	31	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	24	8	2	1	0	0	0	27	8	0	0	0	0	0	29	0	1	3	2	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	1
36	S	2	26	7	0	0	0	2	2	26	0	0	0	28	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	22	11	0	0	0	0	0	28	0	0	0	28	5	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
39	S	13	20	4	0	0	0	2	0	29	0	0	0	15	11	2	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
40	S	0	35	2	0	0	0	0	0	35	0	0	0	25	0	2	3	0	2	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
42	S	13	13	9	0	0	0	6	0	23	0	0	0	13	16	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	25	6	0	0	0	0	0	22	9	1	0	0	4	2	29	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0
44	S	0	34	2	0	0	0	0	0	28	0	2	0	31	0	2	0	1	1	0	0	0	0	0	0	0	0	2	0	0	1	1	0	0	0	0	0
46	S	0	33	2	0	0	0	2	0	30	0	0	0	28	0	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	40	0	0	1	0	3	0	25	0	5	0	25	3	3	1	0	3	3	0	0	0	0	0	0	0	6	0	0	0	2	0	0	1	0	0
58	S	6	24	6	0	1	0	3	9	18	0	3	0	18	6	9	1	0	3	4	0	0	0	0	0	0	0	4	0	2	0	0	0	0	2	0	0
59	S	0	36	3	0	1	0	0	0	24	0	4	0	33	0	3	0	0	3	1	0	0	0	0	0	0	0	5	0	0	0	1	0	0	1	0	0
60	S	22	7	2	0	0	0	0	25	7	0	0	0	7	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	2	28	6	0	0	0	0	0	28	0	0	0	32	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	20	11	0	0	1	0	5	17	8	1	0	0	8	5	22	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
64	S	0	32	2	0	0	0	0	0	32	0	0	0	30	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
67	S	25	7	0	1	0	0	0	25	7	0	0	0	2	0	30	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
6	V	0	30	6	0	0	0	0	0	25	0	2	0	32	0	4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
13	V	11	16	2	0	1	0	0	0	33	0	0	0	19	14	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
17	V	2	31	2	0	0	0	2	3	27	0	1	0	23	0	5	3	0	2	4	0	0	1	0	0	0	0	0	0	1	1	1	0	0	1	0	0
26	V	0	33	0	0	1	0	0	0	33	0	0	0	30	0	2	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
34	V	2	6	23	0	0	0	25	0	6	0	0	0	5	25	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	14	20	0	1	1	0	0	0	31	0	2	0	17	14	2	1	0	1	1	1	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0
51	V	16	13	2	0	1	0	1	11	14	0	0	1	11	4	22	0	1	2	0	0	0	0	0	0	1	0	1	0	0	0	2	0	1	0	0	0
57	V	0	32	2	0	0	0	2	0	30	0	0	0	30	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	111	112	113	121	122	123	131	132	133	211	212	213	221	222	223	231	232	233	311	312	313	321	322	323	331	332	333
1	H	12	10	0	0	5	5	0	0	2	5	0	0	2	5	7	0	0	12	2	0	2	2	5	0	5	7	7
9	H	12	7	0	0	4	7	2	0	0	2	0	2	0	0	9	2	4	12	2	4	0	4	4	2	2	7	2
12	H	9	4	0	2	0	16	2	0	0	0	0	2	0	0	0	14	11	2	2	14	2	0	0	11	2	0	0
18	H	0	0	0	0	0	0	2	30	2	0	0	30	0	0	0	0	0	0	0	0	2	30	0	0	0	2	0
19	H	0	0	0	3	0	28	1	0	0	0	3	0	0	0	0	23	0	5	0	26	1	0	0	0	3	0	0
20	H	0	0	0	0	0	30	2	0	0	0	0	0	0	0	0	25	0	5	0	27	2	2	0	0	2	2	0
21	H	7	3	0	1	0	24	1	0	0	0	1	0	0	0	0	18	3	3	1	20	1	0	0	3	3	0	0
22	H	0	1	0	3	0	23	3	1	0	0	5	1	0	0	0	19	3	1	1	17	3	3	0	3	0	1	0
23	H	1	1	1	5	1	11	0	0	6	1	5	5	1	3	1	8	3	1	1	10	0	6	1	0	3	5	8
24	H	15	5	0	0	5	6	1	0	0	1	0	0	0	13	5	5	0	6	1	6	1	1	0	0	5	1	15
25	H	2	4	0	0	0	24	2	0	2	0	2	0	0	0	0	22	6	0	2	17	4	2	0	4	2	0	0
27	H	10	4	0	2	4	4	2	0	0	0	2	2	0	14	6	0	0	10	2	4	2	2	2	0	6	4	16
28	H	0	0	0	2	0	30	2	0	0	0	2	0	0	0	0	26	0	2	0	28	2	0	0	0	2	0	0
31	H	9	2	0	0	0	19	2	0	0	0	0	0	0	0	2	17	9	2	0	19	2	0	2	7	2	0	0
32	H	0	2	1	4	0	20	4	2	0	1	4	2	1	0	0	17	2	1	2	16	2	2	1	2	0	1	0
38	H	5	2	0	0	0	22	2	1	0	1	0	1	0	0	1	17	5	2	1	17	2	2	1	4	1	1	0
45	H	14	6	0	0	5	6	1	0	0	0	1	0	0	12	5	4	1	6	5	4	1	1	0	0	5	1	15
48	H	0	0	0	0	0	30	2	0	0	0	0	0	0	0	0	25	2	2	0	28	2	0	0	2	2	0	0
49	H	13	5	0	1	4	4	3	0	0	0	1	1	0	6	4	2	6	6	4	3	2	1	0	8	4	2	10
50	H	17	8	0	1	7	0	0	0	0	1	0	0	0	12	8	1	0	8	6	0	0	0	1	1	4	2	18
52	H	0	1	0	0	0	27	7	0	0	0	0	0	0	0	0	21	0	3	1	23	7	0	0	0	3	0	0
55	H	0	0	0	0	0	31	2	0	0	0	0	0	0	0	0	24	0	4	0	29	2	0	0	0	4	0	0
56	H	0	0	0	0	0	33	0	0	0	0	0	0	0	0	0	25	0	5	0	30	0	0	0	0	5	0	0
61	H	4	4	0	0	2	19	2	0	0	0	2	0	2	2	2	14	0	7	4	11	2	0	2	0	2	2	9
65	H	0	2	0	0	0	30	0	0	0	0	0	0	0	0	0	28	0	2	2	25	0	0	0	2	0	2	2
66	H	0	0	0	0	0	30	5	0	0	0	0	2	0	0	0	22	2	2	0	27	2	2	0	0	2	0	0
2	S	0	0	0	0	0	32	2	0	0	0	0	0	0	0	0	27	0	2	0	30	2	0	0	0	2	0	0
3	S	0	2	0	0	0	31	2	0	0	0	0	0	0	0	0	26	0	2	0	29	2	0	0	0	2	0	0
4	S	0	0	0	4	0	28	2	0	0	0	4	0	0	0	0	26	0	2	0	26	4	0	0	0	2	0	0
5	S	0	0	0	2	2	25	4	2	0	0	4	2	2	2	0	20	0	2	0	22	4	2	0	0	2	0	0
7	S	0	0	0	0	0	32	2	0	0	0	0	0	0	0	0	27	0	2	0	30	2	0	0	0	2	0	0
8	S	0	1	0	0	0	23	3	1	0	0	1	1	1	0	0	17	0	3	0	19	3	1	1	0	1	1	9
10	S	2	5	0	0	0	25	2	0	0	5	0	0	2	0	0	15	0	7	0	17	2	2	2	0	2	5	2
11	S	0	0	0	3	1	24	3	0	0	0	5	0	0	3	1	20	1	1	0	22	3	1	0	0	1	0	0
14	S	0	2	2	8	0	26	2	0	0	0	8	0	0	0	0	22	0	2	4	22	0	0	0	0	2	0	0
15	S	0	2	0	2	0	30	2	0	0	0	2	0	0	0	0	26	0	2	0	28	2	0	0	0	2	0	0
16	S	0	0	0	5	0	23	5	0	0	0	3	1	0	0	0	17	1	5	0	23	3	0	0	1	3	0	0
29	S	0	0	0	0	0	32	2	0	0	0	0	0	0	0	0	27	0	2	0	30	2	0	0	0	2	0	0
30	S	0	0	0	0	0	32	2	0	0	0	0	0	0	0	0	27	0	2	0	30	2	0	0	0	2	0	0
33	S	17	7	0	0	7	0	2	0	0	0	0	0	0	17	7	0	0	7	5	0	2	0	0	0	5	0	20
36	S	0	2	0	0	0	26	4	2	0	0	0	2	2	0	0	21	0	2	2	21	4	0	2	0	2	0	0
37	S	0	0	0	0	0	22	5	2	0	0	0	0	0	0	0	19	2	5	0	19	11	0	0	5	5	0	0
39	S	8	4	0	2	0	17	2	2	0	0	0	2	0	0	0	15	8	2	2	15	2	0	0	11	2	0	0
40	S	0	0	0	0	0	32	1	0	0	0	0	0	0	0	0	28	0	1	0	30	1	0	0	0	1	0	0
42	S	9	4	0	2	0	11	4	2	2	2	0	4	0	0	0	9	11	0	0	9	4	4	0	11	0	2	0
43	S	17	6	0	0	6	0	0	0	0	0	0	0	0	13	8	2	0	8	4	0	0	0	2	2	2	4	20
44	S	0	0	0	0	0	32	2	0	0	0	0	0	0	0	0	27	0	2	0	30	2	0	0	0	2	0	0
46	S	0	0	0	2	0	30	2	0	0	0	2	0	0	0	0	25	0	2	0	28	2	0	0	0	2	0	0
54	S	0	0	0	0	0	31	2	0	0	0	2	0	0	0	0	24	2	2	0	26	2	2	0	0	2	0	0
58	S	0	2	2	0	2	17	0	5	2	0	0	2	0	2	5	17	0	2	5	15	2	2	2	0	5	0	2
59	S	0	0	0	0	0	30	5	0	0	0	0	0	0	0	0	25	0	2	0	28	5	0	0	0	2	0	0
60	S	12	7	2	0	7	0	0	0	2	0	0	0	0	17	7	0	0	7	7	0	0	0	0	0	7	0	17
62	S	0	2	0	0	0	28	6	0	0	0	0	0	0	0	0	24	0	2	2	24	6	0	0	0	2	0	0
63	S	13	5	0	2	5	2	2	0	0	5	0	0	2	8	5	0	2	5	0	5	2	2	2	0	5	2	13
64	S	0	0	0	0	0	32	2	0	0	0	0	0	0	0	0	27	0	2	0	30	2	0	0	0	2	0	0
67	S	20	7	0	0	7	0	0	0	0	0	0	0	0	17	7	0	0	7	5	0	0	0	0	0	5	0	22
6	V	0	0	0	2	0	25	4	0	2	0	0	2	0	0	0	23	0	2	0	27	4	0	0	0	4	0	0
13	V	9	2	0	0	0	19	2	0	0	0	0	0	0	0	0	14	14	2	0	16	2	0	0	14	2	0	0
17	V	0	2	0	2	3	22	2	0	0	0	2	0	0	0	3	21	0	5	2	23	2	0	0	0	5	0	0
26	V	0	0	0	0	0	32	2	0	0	0	0	0	0	0	0	27	0	2	0	30	2	0	0	0	2	0	0
34	V	0	2	0	0	0	6	3	17	1	2	1	19	0	0	0	1	1	2	0	1	3	25	0	0	0	4	0
41	V	10	2	0	0	0	20	2	0	0	0	0	0	0	0	0	15	12	2	0	17	2	0	0	12	2	0	0
51	V	11	4	0	1	2	8	4	0	0	1	1	0	0	7	4	1	2	9	1	7	4	1	1	1	8	1	12
57	V	0	0	0	2	0	30	2	0	0	0	2	0	0	0	0	25	0	2	0	28	2	0	0	0	2	0	0

ID	LS	ooo	ood	ooc	odo	odd	odc	oco	ocd	occ	doo	dod	doc	ddo	ddd	ddc	dco	dcd	dcc	coo	cod	coc	cdo	cdd	cdc	cco	ccd	ccc
1	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	0	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	0	0	0	0	33	0	0
18	H	0	0	0	0	0	0	0	25	0	0	0	0	0	25	25	0	0	0	0	0	0	0	25	0	0	0	0
19	H	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	H	0	0	0	0	0	16	0	0	0	0	0	0	0	16	16	16	0	0	0	16	0	0	16	0	0	0	0
22	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	H	0	0	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0
25	H	0	0	0	33	0	0	0	0	0	0	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	H	0	0	0	0	16	0	0	16	0	0	0	0	0	0	16	16	0	0	0	16	0	0	16	0	0	0	0
31	H	0	10	0	0	20	0	0	0	0	0	10	0	0	20	20	0	10	0	0	0	0	10	0	0	0	0	0
32	H	0	0	0	0	0	0	0	0	16	0	0	0	0	50	0	0	0	0	0	0	0	0	16	0	0	16	0
38	H	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0
48	H	0	4	0	0	16	0	8	0	0	0	0	4	4	20	12	8	0	0	4	12	4	0	0	0	0	0	0
49	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
50	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	0	0	0	18	0	9	0	0	0	9	0	0	9	18	0	18	0	0	9	0	9	0	0	0	0	0
55	H	0	7	0	0	7	0	0	7	0	0	0	7	7	30	7	0	7	0	0	0	0	0	15	0	0	0	0
56	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	0	8	0	0	16	0	0	0	8	0	8	0	0	8	16	0	8	0	8	0	0	8	0	0	8	0	0
65	H	0	0	0	8	8	8	8	0	0	0	8	0	0	8	8	8	8	0	0	16	0	0	0	8	0	0	0
66	H	0	0	0	0	20	0	10	0	0	0	10	0	0	10	20	0	10	0	0	10	0	10	0	0	0	0	0
2	S	0	0	0	0	12	0	12	0	0	0	0	12	0	12	12	0	12	0	0	12	0	12	0	0	0	0	0
3	S	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0	0	0
4	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0
14	S	0	0	0	0	0	0	0	25	0	0	0	0	0	50	0	0	0	0	0	0	0	0	25	0	0	0	0
15	S	0	0	0	0	10	0	10	10	0	0	10	0	0	20	10	0	10	0	0	0	10	10	0	0	0	0	0
16	S	33	33	0	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	50	0
30	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	0	0	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0	0	0	0	0	20	0	0	0	20	20
36	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	0	25	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0
42	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0
44	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	0	33	0	0	0	0	0	33	0	0	0	0
46	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	0	0	0	10	10	10	0	0	0	10	0	0	0	10	0	20	0	0	10	0	10	10	0	0	0	0
58	S	0	0	9	0	18	0	9	0	0	0	0	0	0	18	18	9	0	0	0	18	0	0	0	0	0	0	0
59	S	0	0	0	0	14	0	0	0	0	0	0	0	0	14	28	0	14	0	0	14	0	0	14	0	0	0	0
60	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	0	0	25	0	12	0	25	0	0	0	0	0	0	0	12	0	0	0	12	12	0	0	0	0	0	0	0
26	V	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	0	0	0	0	0	0	0	25	0	0	25	0	25	0	0	0	0	0	0	0	0	0	25	0	0	0	0
51	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	0	0	33	33
57	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	111	112	113	11o	11d	11c	121	122	123	12o	12d	12c	131	132	133	13o	13d	13c	1o1	1o2	1o3	1oo	1od	1oc	1d1	1d2	1d3	1do	1dd	1dc	1c1	1c2	1c3	1co	1cd	1cc
1	H	12	10	0	0	0	0	0	5	5	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	12	7	0	0	0	0	0	4	7	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	11	2	0	0	0	0	2	0	19	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
18	H	0	0	0	0	0	0	0	0	0	0	0	0	2	31	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	H	0	0	0	0	0	0	4	0	31	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	0	0	0	0	0	0	0	0	30	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	H	9	4	0	0	0	0	2	0	25	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
22	H	0	2	0	0	0	0	4	0	24	0	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	1	1	1	0	0	0	5	1	12	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	H	16	5	0	0	0	0	0	5	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
25	H	2	2	0	0	0	0	0	0	27	0	1	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
27	H	10	4	0	0	0	0	2	4	4	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	H	0	0	0	0	0	0	3	0	41	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	7	3	0	1	0	0	0	0	19	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
32	H	0	3	0	0	0	0	3	0	21	0	2	1	3	3	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
38	H	6	3	0	0	0	0	0	0	23	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	15	7	0	0	0	0	0	5	5	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	H	0	0	0	0	0	0	0	0	29	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
49	H	14	6	0	0	0	0	1	4	4	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	H	17	8	0	0	0	0	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	0	0	0	0	0	0	0	26	0	5	0	5	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
55	H	0	0	0	0	0	0	0	0	34	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
56	H	0	0	0	0	0	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	0	6	0	0	0	0	0	3	24	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
65	H	0	0	0	0	0	0	0	0	40	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	H	0	0	0	0	0	0	0	0	26	0	5	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
2	S	0	0	0	0	0	0	0	0	32	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
3	S	0	2	0	0	0	0	0	0	34	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
4	S	0	0	0	0	0	0	4	0	29	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	0	0	0	0	0	0	2	2	25	0	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	0	0	0	0	0	0	0	34	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	S	0	1	0	0	0	0	0	0	23	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	2	5	0	0	0	0	0	0	25	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	0	0	0	0	0	4	2	22	0	2	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	S	0	2	0	0	1	0	7	0	26	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
15	S	0	0	0	0	0	0	0	0	35	0	2	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
16	S	0	0	0	0	0	0	6	0	24	0	1	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	S	0	0	0	0	0	0	0	0	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
30	S	0	0	0	0	0	0	0	0	32	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	18	9	0	0	0	0	0	9	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	2	0	0	0	0	0	0	26	0	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	0	0	0	0	0	0	0	24	0	0	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	9	4	0	0	0	0	2	0	19	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	0	0	0	0	0	0	0	40	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	S	9	4	0	0	0	0	2	0	11	0	0	0	4	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	19	7	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	S	0	0	0	0	0	0	0	0	30	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	0	0	0	0	0	2	0	32	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	0	0	0	0	0	0	0	32	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
58	S	0	3	3	0	0	0	0	3	18	0	2	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
59	S	0	0	0	0	0	0	0	0	28	0	4	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
60	S	12	7	2	0	0	0	0	7	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	0	2	0	0	0	0	0	0	28	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	15	6	0	0	0	0	0	6	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
64	S	0	0	0	0	0	0	0	0	34	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	16	8	0	1	0	0	0	8	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	0	0	0	0	0	0	0	0	26	0	2	0	4	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	10	2	0	0	0	0	0	0	17	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
17	V	0	2	0	0	0	0	2	4	25	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	V	0	0	0	0	0	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
34	V	0	2	0	0	0	0	0	0	6	0	0	0	3	17	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	13	0	0	1	0	0	0	0	16	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
51	V	12	4	0	0	0	0	1	3	9	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
57	V	0	0	0	0	0	0	2	0	30	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	211	212	213	21o	21d	21c	221	222	223	22o	22d	22c	231	232	233	23o	23d	23c	2o1	2o2	2o3	2oo	2od	2oc	2d1	2d2	2d3	2do	2dd	2dc	2c1	2c2	2c3	2co	2cd	2cc
1	H	5	0	0	0	0	0	2	5	7	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	2	0	2	0	0	0	0	0	9	0	0	0	2	4	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	0	2	0	0	0	0	0	0	0	0	0	13	13	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	H	0	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
19	H	0	4	0	0	0	0	0	0	0	0	0	0	25	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	0	0	0	0	0	0	0	0	0	0	0	0	22	0	5	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
21	H	0	2	0	0	0	0	0	0	0	0	0	0	16	4	2	0	1	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
22	H	0	4	2	0	0	0	0	0	0	0	0	0	20	4	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	1	5	5	0	0	0	1	3	1	0	0	0	8	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	H	1	0	0	0	0	0	0	14	5	0	0	0	5	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	H	0	2	0	0	0	0	0	0	0	0	0	0	19	8	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
27	H	0	2	2	0	0	0	0	14	4	0	1	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
28	H	0	3	0	0	0	0	0	0	0	0	0	0	24	0	0	1	2	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
31	H	0	0	0	0	0	0	0	0	3	0	0	0	7	15	3	1	1	0	0	0	0	0	0	0	0	0	2	0	1	1	0	0	0	0	0	0
32	H	1	3	3	0	0	0	1	0	0	0	0	0	17	1	1	0	1	1	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0
38	H	1	0	1	0	0	0	0	0	1	0	0	0	15	6	3	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	0	1	0	0	0	0	0	13	5	0	0	0	2	1	7	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
48	H	0	0	0	0	0	0	0	0	0	0	0	0	18	3	3	0	0	2	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
49	H	0	1	1	0	0	0	0	7	4	0	0	0	1	7	7	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	H	1	0	0	0	0	0	0	12	8	0	0	0	1	0	7	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	0	0	0	0	0	0	0	0	0	0	0	17	0	5	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
55	H	0	0	0	0	0	0	0	0	0	0	0	0	21	0	4	1	0	1	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
56	H	0	0	0	0	0	0	0	0	0	0	0	0	24	0	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	0	3	0	0	0	0	3	3	0	0	1	0	17	0	3	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
65	H	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	1	2	1	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
66	H	0	0	3	0	0	0	0	0	0	0	0	0	15	3	3	0	0	1	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
2	S	0	0	0	0	0	0	0	0	0	0	0	0	25	0	3	0	0	2	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
3	S	0	0	0	0	0	0	0	0	0	0	0	0	25	0	2	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
4	S	0	4	0	0	0	0	0	0	0	0	0	0	25	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	0	4	2	0	0	0	2	2	0	0	0	0	20	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	0	0	0	0	0	0	0	0	0	0	0	26	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	S	0	1	1	0	0	0	1	0	0	0	0	0	17	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	5	0	0	0	0	0	2	0	0	0	0	0	15	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	6	0	0	0	0	0	4	2	0	0	0	20	2	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
14	S	0	7	0	0	0	0	0	0	0	0	0	0	21	0	2	0	0	1	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0
15	S	0	0	0	0	0	0	0	0	0	0	0	0	29	0	3	0	1	2	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0
16	S	0	4	2	0	0	0	0	0	0	0	0	0	17	2	4	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
29	S	0	0	0	0	0	0	0	0	0	0	0	0	25	0	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	0	0	0	0	0	0	0	0	0	0	0	27	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	0	0	0	0	0	0	0	21	9	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	0	2	0	0	0	2	0	0	0	0	0	21	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	0	0	0	0	0	0	0	0	0	0	0	21	3	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	0	0	2	0	0	0	0	0	0	0	0	0	14	9	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	0	0	0	0	0	0	0	0	0	0	0	23	0	2	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	S	2	0	4	0	0	0	0	0	0	0	0	0	9	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	0	0	0	0	0	0	0	14	7	1	0	0	0	0	9	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
44	S	0	0	0	0	0	0	0	0	0	0	0	0	27	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
46	S	0	2	0	0	0	0	0	0	0	0	0	0	27	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	4	0	0	0	0	0	0	0	0	0	0	16	4	4	0	0	2	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
58	S	0	0	3	0	0	0	0	3	3	0	1	0	14	0	0	1	0	1	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0
59	S	0	0	0	0	0	0	0	0	0	0	0	0	21	0	3	0	0	1	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
60	S	0	0	0	0	0	0	0	17	7	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	0	0	0	0	0	0	0	0	0	0	0	0	24	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	3	0	0	0	0	0	3	9	6	0	0	0	0	3	6	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	0	0	0	0	0	0	0	0	0	0	0	0	26	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	0	0	0	0	0	0	0	19	8	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	0	0	0	0	0	0	0	0	0	0	0	0	24	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
13	V	0	0	0	0	0	0	0	0	0	0	0	0	15	15	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	0	2	0	0	0	0	0	0	4	0	0	0	18	0	5	2	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
26	V	0	0	0	0	0	0	0	0	0	0	0	0	27	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	V	2	1	19	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	0	0	0	0	0	0	0	0	0	0	0	0	10	16	3	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
51	V	0	1	0	0	0	0	0	8	4	0	0	0	1	3	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
57	V	0	2	0	0	0	0	0	0	0	0	0	0	25	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	311	312	313	31o	31d	31c	321	322	323	32o	32d	32c	331	332	333	33o	33d	33c	3o1	3o2	3o3	3oo	3od	3oc	3d1	3d2	3d3	3do	3dd	3dc	3c1	3c2	3c3	3co	3cd	3cc
1	H	2	0	2	0	0	0	2	5	0	0	0	0	5	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	2	4	0	0	0	0	4	4	2	0	0	0	2	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	13	0	2	0	0	0	0	13	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
18	H	0	0	2	0	0	0	28	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	H	0	27	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0
20	H	0	27	2	0	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
21	H	2	23	0	0	0	0	0	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0
22	H	2	18	4	0	0	0	2	0	4	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	1	10	0	0	0	0	5	1	0	0	0	0	3	5	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
24	H	1	5	0	0	1	0	0	0	0	0	0	0	5	0	16	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
25	H	0	19	2	1	0	0	2	0	5	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
27	H	2	4	2	0	0	0	2	2	0	0	0	0	6	4	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	H	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	2	0	0	0	0	0
31	H	0	19	0	0	1	0	0	3	11	0	0	0	3	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
32	H	1	17	1	0	1	0	3	1	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
38	H	1	15	3	0	0	0	3	1	4	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
45	H	3	4	1	0	0	0	1	0	0	0	0	0	4	1	16	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
48	H	0	37	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0
49	H	3	2	2	0	0	0	1	0	8	0	0	0	4	2	10	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
50	H	6	0	0	0	0	0	0	1	1	0	0	0	5	2	17	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
52	H	0	29	8	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0
55	H	0	34	0	0	1	0	0	0	0	0	0	0	4	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0
56	H	0	29	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
61	H	0	17	0	1	0	0	0	3	0	0	0	0	0	3	10	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	1
65	H	0	25	0	0	0	0	0	0	5	0	0	0	0	5	0	0	0	0	2	0	0	0	0	0	1	0	1	0	0	0	3	0	0	0	0	0
66	H	0	34	0	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
2	S	0	35	0	1	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
3	S	0	31	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
4	S	0	27	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	0	22	4	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	28	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
8	S	0	19	3	0	0	0	1	1	0	0	0	0	1	1	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	17	2	0	0	0	2	2	0	0	0	0	2	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	24	4	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	S	2	26	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
15	S	0	29	0	1	1	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0
16	S	0	24	2	0	0	0	0	0	2	0	0	0	4	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
29	S	0	31	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
30	S	0	30	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	3	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1
36	S	2	21	4	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	18	12	0	0	0	0	0	6	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
39	S	2	12	2	0	0	0	0	0	12	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
40	S	0	28	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
42	S	0	9	4	0	0	0	4	0	11	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	4	0	0	0	0	0	0	0	2	0	0	0	2	2	21	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
44	S	0	30	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
46	S	0	27	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	32	0	0	0	0	4	0	0	0	0	0	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0
58	S	0	22	0	0	0	0	3	3	0	0	0	0	3	0	3	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
59	S	0	39	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
60	S	7	0	0	0	0	0	0	0	0	0	0	0	7	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	2	24	6	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	0	6	0	0	1	0	3	3	0	0	0	0	6	3	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	0	28	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
67	S	2	0	0	0	0	0	0	0	0	0	0	0	2	0	25	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
6	V	0	29	4	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	0	15	2	0	1	0	0	0	15	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	2	21	1	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
26	V	0	32	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
34	V	0	1	3	0	0	0	25	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	0	20	0	0	0	0	0	0	16	0	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
51	V	0	8	3	0	0	0	0	1	1	0	0	1	8	1	11	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0
57	V	0	28	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	o11	o12	o13	o1o	o1d	o1c	o21	o22	o23	o2o	o2d	o2c	o31	o32	o33	o3o	o3d	o3c	oo1	oo2	oo3	ooo	ood	ooc	od1	od2	od3	odo	odd	odc	oc1	oc2	oc3	oco	ocd	occ
1	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
18	H	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	H	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	H	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	H	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	H	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	H	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	H	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	1	0	0
49	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	H	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
56	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	H	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	H	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	S	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	S	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	S	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	S	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	S	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
44	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	S	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	S	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	V	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	d11	d12	d13	d1o	d1d	d1c	d21	d22	d23	d2o	d2d	d2c	d31	d32	d33	d3o	d3d	d3c	do1	do2	do3	doo	dod	doc	dd1	dd2	dd3	ddo	ddd	ddc	dc1	dc2	dc3	dco	dcd	dcc
1	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
19	H	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
20	H	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	H	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	H	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	H	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
32	H	0	1	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	H	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	2	2	0	0	0	2	0	0
49	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
50	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	H	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0
56	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
65	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	H	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	S	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	S	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	S	0	2	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
16	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	S	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
59	S	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
26	V	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	V	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	c11	c12	c13	c1o	c1d	c1c	c21	c22	c23	c2o	c2d	c2c	c31	c32	c33	c3o	c3d	c3c	co1	co2	co3	coo	cod	coc	cd1	cd2	cd3	cdo	cdd	cdc	cc1	cc2	cc3	cco	ccd	ccc
1	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
18	H	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	H	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	H	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	H	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
49	H	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	H	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
65	H	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	H	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	S	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	S	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	S	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
36	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	S	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	V	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	V	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 28.

The Features Extracted from the Tracking Mechanism in the Second Online Lesson.

ID	LS	1	2	3	O	D	C	1	2	3	O	D	C	11	12	13	21	22	23	31	32	33	OO	OD	OC	DO	DD	DC	CO	CD	CC	CC
1	H	39	21	39	0	100	0	39	21	39	0	5	0	14	22	3	0	0	22	22	0	14	0	0	0	0	100	0	0	0	0	0
9	H	34	27	37	0	0	0	34	27	37	0	0	0	0	21	14	3	0	25	28	7	0	0	0	0	0	0	0	0	0	0	0
12	H	40	22	37	0	0	100	40	22	37	0	0	1	3	23	15	0	0	23	34	0	0	0	0	0	0	0	0	0	0	0	0
18	H	40	22	37	33	66	0	40	22	37	2	4	0	3	23	15	3	0	19	30	0	3	0	20	0	20	60	0	0	0	0	0
19	H	39	21	39	0	0	0	39	21	39	0	0	0	0	22	18	0	0	22	37	0	0	0	0	0	0	0	0	0	0	0	0
20	H	42	18	39	0	50	50	42	18	39	0	1	1	15	12	15	0	0	18	25	6	6	0	0	0	0	0	100	0	0	0	0
21	H	38	23	38	0	100	0	38	23	38	0	1	0	0	24	16	0	0	24	36	0	0	0	0	0	0	0	0	0	0	0	0
22	H	38	23	38	0	100	0	38	23	38	0	1	0	0	24	16	0	0	24	36	0	0	0	0	0	0	0	0	0	0	0	0
23	H	44	24	32	16	66	16	44	24	32	1	4	1	16	16	12	12	0	12	12	8	8	0	20	0	0	60	20	0	0	0	0
28	H	43	21	34	0	0	0	43	21	34	0	0	0	13	22	9	9	0	13	18	0	13	0	0	0	0	0	0	0	0	0	0
31	H	35	25	38	22	77	0	35	25	38	2	7	0	10	23	3	3	3	20	20	0	16	0	12	0	12	75	0	0	0	0	0
32	H	38	23	38	0	100	0	38	23	38	0	1	0	4	20	16	0	0	24	32	4	0	0	0	0	0	0	0	0	0	0	0
38	H	40	26	33	0	100	0	40	26	33	0	1	0	3	24	13	3	3	20	31	0	0	0	0	0	0	0	0	0	0	0	0
45	H	36	24	39	20	80	0	36	24	39	1	4	0	0	21	15	6	0	18	28	3	6	0	25	0	0	75	0	0	0	0	0
48	H	38	23	38	0	0	0	38	23	38	0	0	0	32	4	4	0	20	4	4	0	32	0	0	0	0	0	0	0	0	0	0
49	H	37	29	33	0	0	0	37	29	33	0	0	0	0	30	8	4	0	26	30	0	0	0	0	0	0	0	0	0	0	0	0
50	H	38	23	38	0	0	0	38	23	38	0	0	0	32	4	4	4	4	16	0	16	20	0	0	0	0	0	0	0	0	0	0
52	H	38	23	38	25	75	0	38	23	38	2	6	0	0	24	16	0	0	24	36	0	0	0	14	0	14	71	0	0	0	0	0
53	H	34	24	41	40	40	20	34	24	41	2	2	1	0	21	14	0	0	25	32	3	3	25	0	0	0	25	25	25	0	0	25
55	H	37	25	37	20	60	20	37	25	37	2	6	2	11	23	3	0	0	23	23	3	11	0	11	0	0	44	22	11	11	0	0
56	H	38	23	38	0	0	0	38	23	38	0	0	0	12	24	4	0	0	24	24	0	12	0	0	0	0	0	0	0	0	0	0
61	H	38	23	38	25	75	0	38	23	38	2	6	0	0	24	16	0	0	24	36	0	0	0	14	0	14	71	0	0	0	0	0
65	H	45	18	35	12	87	0	45	18	35	1	7	0	11	15	19	1	3	13	30	0	3	0	14	0	0	85	0	0	0	0	0
66	H	38	22	38	27	72	0	38	22	38	3	8	0	10	23	6	0	0	23	26	0	10	10	10	0	10	70	0	0	0	0	10
2	S	38	23	38	0	83	16	38	23	38	0	5	1	4	20	16	0	4	20	32	0	4	0	0	0	0	80	20	0	0	0	0
3	S	37	24	37	0	85	14	37	24	37	0	6	1	10	18	10	6	1	16	20	5	11	0	0	0	0	66	16	0	16	0	0
4	S	38	23	38	25	75	0	38	23	38	1	3	0	0	24	16	0	0	24	36	0	0	0	0	0	33	66	0	0	0	0	0
5	S	40	24	36	0	100	0	40	24	36	0	1	0	16	20	4	0	0	25	20	4	8	0	0	0	0	0	0	0	0	0	0
7	S	39	25	35	27	63	9	39	25	35	3	7	1	7	22	11	0	0	22	29	3	3	10	10	10	10	50	0	0	10	0	10
8	S	39	21	39	0	0	0	39	21	39	0	0	0	0	22	18	0	0	22	37	0	0	0	0	0	0	0	0	0	0	0	0
10	S	41	20	37	0	0	0	41	20	37	0	0	0	8	17	17	4	0	17	26	4	4	0	0	0	0	0	0	0	0	0	0
11	S	38	19	41	0	100	0	38	19	41	0	5	0	0	20	20	0	0	20	36	0	3	0	0	0	0	100	0	0	0	0	0
14	S	38	23	38	0	0	0	38	23	38	0	0	0	0	24	16	0	0	24	36	0	0	0	0	0	0	0	0	0	0	0	0
15	S	36	25	37	22	72	4	36	25	37	5	16	1	7	19	10	3	1	21	24	5	7	4	14	0	9	61	4	4	0	0	4
16	S	38	23	38	0	100	0	38	23	38	0	6	0	12	24	4	0	0	24	24	0	12	0	0	0	0	100	0	0	0	0	0
29	S	37	25	37	0	0	0	37	25	37	0	0	0	0	26	13	0	0	26	34	0	0	0	0	0	0	0	0	0	0	0	0
30	S	38	23	38	0	0	0	38	23	38	0	0	0	0	24	16	0	0	24	36	0	0	0	0	0	0	0	0	0	0	0	0
33	S	36	24	40	25	75	0	36	24	40	1	3	0	4	25	4	0	0	25	29	0	12	0	33	0	0	66	0	0	0	0	0
35	S	38	23	38	0	100	0	38	23	38	0	1	0	20	4	16	0	20	4	16	0	20	0	0	0	0	0	0	0	0	0	0
36	S	38	23	38	0	0	0	38	23	38	0	0	0	0	24	16	0	0	24	36	0	0	0	0	0	0	0	0	0	0	0	0
37	S	33	25	41	0	0	0	33	25	41	0	0	0	0	26	8	0	0	26	30	0	8	0	0	0	0	0	0	0	0	0	0
39	S	38	19	41	0	0	0	38	19	41	0	0	0	17	11	8	11	0	8	8	8	25	0	0	0	0	0	0	0	0	0	0
40	S	32	25	41	28	57	14	32	25	41	2	4	1	0	16	16	0	3	23	30	6	3	0	16	0	0	50	16	16	0	0	0
42	S	38	23	38	0	0	0	38	23	38	0	0	0	16	20	4	0	0	24	20	4	12	0	0	0	0	0	0	0	0	0	0
43	S	42	31	26	66	33	0	42	31	26	2	1	0	35	5	2	2	27	2	2	0	21	50	50	0	0	0	0	0	0	0	50
44	S	38	23	38	0	0	0	38	23	38	0	0	0	12	24	4	0	0	24	24	0	12	0	0	0	0	0	0	0	0	0	0
46	S	40	26	33	0	0	0	40	26	33	0	0	0	0	27	13	6	0	20	31	0	0	0	0	0	0	0	0	0	0	0	0
47	S	38	23	38	0	0	0	38	23	38	0	0	0	0	24	16	0	0	24	36	0	0	0	0	0	0	0	0	0	0	0	0
54	S	33	33	33	0	0	0	33	33	33	0	0	0	0	35	0	0	0	35	29	0	0	0	0	0	0	0	0	0	0	0	0
58	S	32	19	48	22	77	0	32	19	48	2	7	0	30	3	0	0	16	3	0	0	46	12	12	0	0	75	0	0	0	0	12
59	S	37	20	41	22	66	11	37	20	41	2	6	1	0	21	17	0	0	21	34	0	4	0	12	0	0	62	12	12	0	0	0
60	S	38	23	38	0	100	0	38	23	38	0	1	0	0	24	16	0	0	24	36	0	0	0	0	0	0	0	0	0	0	0	0
62	S	38	23	38	0	0	0	38	23	38	0	0	0	0	24	16	0	0	24	36	0	0	0	0	0	0	0	0	0	0	0	0
63	S	41	0	58	0	0	0	41	0	58	0	0	0	18	0	27	0	0	0	27	0	27	0	0	0	0	0	0	0	0	0	0
64	S	38	23	38	50	50	0	38	23	38	1	1	0	4	24	12	0	0	24	32	0	4	0	100	0	0	0	0	0	0	0	0
67	S	38	23	38	0	0	0	38	23	38	0	0	0	0	24	16	0	0	24	36	0	0	0	0	0	0	0	0	0	0	0	0
6	V	40	22	37	0	0	0	40	22	37	0	0	0	3	23	15	0	0	23	34	0	0	0	0	0	0	0	0	0	0	0	0
13	V	38	23	38	0	0	0	38	23	38	0	0	0	32	4	4	0	0	24	4	20	12	0	0	0	0	0	0	0	0	0	0
17	V	33	20	46	12	75	12	33	20	46	1	6	1	0	20	13	0	0	20	31	0	13	0	0	14	14	71	0	0	0	0	0
26	V	40	22	37	33	50	16	40	22	37	2	3	1	0	23	19	3	0	19	34	0	0	0	20	0	0	40	20	20	0	0	0
34	V	38	23	38	0	66	33	38	23	38	0	2	1	8	21	9	4	0	20	26	2	8	0	0	0	0	50	50	0	0	0	0
41	V	38	23	38	14	85	0	38	23	38	1	6	0	0	24	16	0	0	24	36	0	0	0	16	0	16	66	0	0	0	0	0
57	V	37	22	40	0	0	0	37	22	40	0	0	0	30	3	3	0	19	3	3	0	34	0	0	0	0	0	0	0	0	0	0

ID	LS	11	12	13	1O	1D	1C	21	22	23	2O	2D	2C	31	32	33	3O	3D	3C	O1	O2	O3	OO	OD	OC	D1	D2	D3	DO	DD	DC	C1	C2	D3	CO	CD	CC
1	H	18	27	4	0	0	0	0	0	9	0	4	0	27	0	13	0	1	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
9	H	0	21	14	0	0	0	3	0	25	0	0	0	28	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	4	24	16	0	0	0	0	0	24	0	0	0	32	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
18	H	4	28	14	0	1	0	4	0	9	0	3	0	33	0	4	1	0	0	2	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
19	H	0	22	18	0	0	0	0	0	22	0	0	0	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	16	13	16	0	0	0	0	0	20	0	0	0	23	3	6	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0
21	H	0	25	16	0	0	0	0	0	20	0	1	0	37	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
22	H	0	25	16	0	0	0	0	0	20	0	1	0	37	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
23	H	20	20	15	0	0	0	5	0	10	0	3	0	15	5	10	0	1	0	1	0	0	0	0	0	1	1	1	0	0	1	1	0	0	0	0	0
28	H	13	22	9	0	0	0	9	0	13	0	0	0	18	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	13	27	4	0	1	0	4	4	0	0	6	0	22	0	22	1	0	0	2	0	0	0	0	0	0	1	6	0	0	0	0	0	0	0	0	0
32	H	4	20	16	0	0	0	0	0	25	0	0	0	33	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
38	H	3	25	14	0	0	0	3	0	21	0	1	0	32	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
45	H	0	19	16	0	1	0	6	0	19	0	0	0	29	3	6	0	0	0	1	0	0	0	0	0	0	1	0	0	3	0	0	0	0	0	0	0
48	H	32	4	4	0	0	0	0	20	4	0	0	0	4	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	H	0	30	8	0	0	0	4	0	26	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	H	32	4	4	0	0	0	4	4	16	0	0	0	0	16	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	33	22	0	0	0	0	0	0	0	6	0	44	0	0	1	0	0	2	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
53	H	0	24	16	0	0	0	0	0	24	0	1	0	32	4	0	1	1	1	0	0	0	1	0	0	0	0	2	0	0	0	1	0	0	0	0	0
55	H	16	33	5	0	0	0	0	0	0	0	6	0	22	5	16	0	0	2	2	0	0	0	0	0	0	0	6	0	0	0	1	0	0	1	0	0
56	H	12	24	4	0	0	0	0	0	24	0	0	0	24	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	0	33	22	0	0	0	0	0	0	0	6	0	44	0	0	1	0	0	2	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
65	H	13	17	22	0	0	0	2	4	6	0	4	0	28	0	4	0	3	0	1	0	0	0	0	0	3	0	4	0	0	0	0	0	0	0	0	0
66	H	12	28	8	0	0	0	0	0	16	0	3	0	24	0	12	1	1	0	2	0	0	1	0	0	1	0	3	0	4	0	0	0	0	0	0	0
2	S	5	26	21	0	0	0	0	5	5	0	4	0	36	0	0	0	1	1	0	0	0	0	0	0	0	0	5	0	0	0	1	0	0	0	0	0
3	S	11	20	11	0	0	0	7	0	14	0	3	0	22	3	9	0	3	0	0	0	0	0	0	0	0	2	3	0	0	1	0	0	1	0	0	0
4	S	0	27	18	0	0	0	0	0	27	0	0	0	27	0	0	1	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
5	S	17	21	4	0	0	0	0	0	21	0	1	0	21	4	8	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
7	S	5	33	16	1	0	0	0	0	5	0	6	0	33	0	5	1	1	1	3	0	0	0	0	0	0	1	5	0	0	0	1	0	0	0	0	0
8	S	0	22	18	0	0	0	0	0	22	0	0	0	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	8	17	17	0	0	0	4	0	17	0	0	0	26	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	24	24	0	0	0	0	0	8	0	4	0	40	0	4	0	1	0	0	0	0	0	0	0	1	0	4	0	0	0	0	0	0	0	0	0
14	S	0	24	16	0	0	0	0	0	24	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	S	7	26	14	1	0	0	4	2	12	0	7	0	24	4	2	1	7	0	4	0	0	1	0	0	2	1	10	0	2	1	0	0	0	1	0	0
16	S	15	31	5	0	0	0	0	0	5	0	5	0	26	0	15	0	1	0	0	0	0	0	0	0	1	0	5	0	0	0	0	0	0	0	0	0
29	S	0	26	13	0	0	0	0	0	26	0	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	24	16	0	0	0	0	0	24	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	4	23	4	0	1	0	0	0	19	0	2	0	33	0	14	0	0	0	1	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0
35	S	20	4	16	0	0	0	0	20	4	0	0	0	16	0	16	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
36	S	0	24	16	0	0	0	0	0	24	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	26	8	0	0	0	0	0	26	0	0	0	30	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	17	11	8	0	0	0	11	0	8	0	0	0	8	8	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	20	20	0	0	0	0	4	16	0	3	0	32	8	0	0	1	1	2	0	0	0	0	0	0	0	4	0	0	0	0	0	0	1	0	0
42	S	16	20	4	0	0	0	0	0	24	0	0	0	20	4	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	34	5	2	1	0	0	2	28	0	0	1	0	2	0	22	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
44	S	12	24	4	0	0	0	0	0	24	0	0	0	24	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	27	13	0	0	0	6	0	20	0	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	S	0	24	16	0	0	0	0	0	24	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	35	0	0	0	0	0	0	35	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	S	32	3	0	0	0	0	0	14	0	0	2	0	0	0	50	0	0	0	1	0	0	1	0	0	0	1	1	0	5	0	0	0	0	0	0	0
59	S	0	31	18	0	1	0	0	0	0	0	5	0	43	0	6	0	0	1	2	0	0	0	0	0	0	0	6	0	0	0	0	0	0	1	0	0
60	S	0	25	16	0	0	0	0	0	20	0	1	0	37	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
62	S	0	24	16	0	0	0	0	0	24	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	18	0	27	0	0	0	0	0	0	0	0	0	27	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	4	25	12	0	0	0	0	0	20	0	1	0	33	0	4	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
67	S	0	24	16	0	0	0	0	0	24	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	3	23	15	0	0	0	0	0	23	0	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	32	4	4	0	0	0	0	0	24	0	0	0	4	20	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	0	26	17	0	0	0	0	0	26	0	0	0	13	0	17	0	6	0	0	0	0	0	0	1	5	0	0	1	0	0	1	0	0	0	0	0
26	V	0	27	22	0	0	0	0	0	13	0	3	0	36	0	0	0	0	1	2	0	0	0	0	0	1	0	2	0	0	0	0	0	0	1	0	0
34	V	6	22	9	0	0	1	4	0	18	0	2	0	27	2	8	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0
41	V	0	33	22	0	0	0	0	0	0	0	6	0	44	0	0	1	0	0	1	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
57	V	30	3	3	0	0	0	0	19	3	0	0	0	3	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	111	112	113	121	122	123	131	132	133	211	212	213	221	222	223	231	232	233	311	312	313	321	322	323	331	332	333
1	H	7	3	3	0	0	23	0	0	3	0	0	0	0	0	0	19	0	3	3	19	0	0	0	0	3	0	7
9	H	0	0	0	3	0	18	11	0	0	0	3	0	0	0	0	18	7	0	0	14	14	0	0	7	0	0	0
12	H	0	4	0	0	0	24	12	0	0	0	0	0	0	0	0	24	0	0	0	20	16	0	0	0	0	0	0
18	H	0	0	4	4	0	20	12	0	4	0	0	4	0	0	0	20	0	0	4	20	8	0	0	0	0	0	0
19	H	0	0	0	0	0	23	15	0	0	0	0	0	0	0	0	23	0	0	0	19	19	0	0	0	0	0	0
20	H	9	3	3	0	0	12	12	0	0	0	0	0	0	0	0	6	6	6	3	9	12	0	0	6	6	0	0
21	H	0	0	0	0	0	25	12	0	0	0	0	0	0	0	0	25	0	0	0	20	16	0	0	0	0	0	0
22	H	0	0	0	0	0	25	12	0	0	0	0	0	0	0	0	25	0	0	0	20	16	0	0	0	0	0	0
23	H	4	8	4	8	0	8	4	4	4	4	0	8	0	0	0	8	4	0	8	4	0	4	0	4	0	0	4
28	H	9	0	4	9	0	14	4	0	4	0	9	0	0	0	0	14	0	0	4	9	4	0	0	0	0	0	9
31	H	6	0	3	3	3	17	0	0	3	0	3	0	0	0	3	20	0	0	3	17	0	0	0	0	0	0	13
32	H	0	4	0	0	0	20	12	0	0	0	0	0	0	0	0	20	4	0	4	12	16	0	0	4	0	0	0
38	H	0	0	3	3	3	17	10	0	0	0	3	0	0	0	3	21	0	0	3	17	10	0	0	0	0	0	0
45	H	0	0	0	3	0	19	12	0	0	0	3	3	0	0	0	12	3	3	0	16	12	3	0	0	3	0	3
48	H	25	4	4	0	4	0	0	0	4	0	0	0	0	16	4	0	0	4	4	0	0	0	0	0	4	0	25
49	H	0	0	0	4	0	27	4	0	0	0	4	0	0	0	0	27	0	0	0	22	9	0	0	0	0	0	0
50	H	25	4	4	0	0	4	0	0	4	4	0	0	0	0	4	0	8	8	0	0	0	4	4	8	0	8	8
52	H	0	0	0	0	0	25	12	0	0	0	0	0	0	0	0	25	0	0	0	20	16	0	0	0	0	0	0
53	H	0	0	0	0	0	22	11	0	0	0	0	0	0	0	0	22	0	3	0	18	14	0	0	3	0	3	0
55	H	8	0	4	0	0	24	0	0	4	0	0	0	0	0	0	24	0	0	4	20	0	0	0	0	0	4	8
56	H	8	0	4	0	0	25	0	0	4	0	0	0	0	0	0	25	0	0	4	20	0	0	0	0	0	0	8
61	H	0	0	0	0	0	25	12	0	0	0	0	0	0	0	0	25	0	0	0	20	16	0	0	0	0	0	0
65	H	1	3	5	1	1	11	17	0	0	0	0	1	0	1	1	11	0	1	9	9	11	0	0	0	1	0	1
66	H	6	0	3	0	0	24	3	0	3	0	0	0	0	0	0	24	0	0	3	20	3	0	0	0	0	0	6
2	S	0	4	0	0	4	16	12	0	0	0	0	0	0	0	4	16	0	4	4	12	16	0	0	0	4	0	0
3	S	5	1	3	3	1	13	8	0	1	1	3	1	0	0	1	6	3	6	1	13	5	3	0	1	5	1	3
4	S	0	0	0	0	0	25	12	0	0	0	0	0	0	0	0	25	0	0	0	20	16	0	0	0	0	0	0
5	S	8	4	4	0	0	21	0	0	4	0	0	0	0	0	0	21	4	0	8	13	0	0	0	4	0	0	4
7	S	0	3	3	0	0	19	7	0	3	0	0	0	0	0	0	19	3	0	7	15	7	0	0	3	3	0	0
8	S	0	0	0	0	0	23	15	0	0	0	0	0	0	0	0	23	0	0	0	19	19	0	0	0	0	0	0
10	S	0	0	9	0	0	18	9	0	4	0	4	0	0	0	0	18	0	0	4	13	9	4	0	0	0	4	0
11	S	0	0	0	0	0	20	17	0	3	0	0	0	0	0	0	20	0	0	0	17	20	0	0	0	0	0	0
14	S	0	0	0	0	0	25	12	0	0	0	0	0	0	0	0	25	0	0	0	20	16	0	0	0	0	0	0
15	S	3	3	0	3	1	14	8	0	0	1	1	0	0	0	1	10	5	5	1	12	10	0	0	5	5	0	1
16	S	8	0	4	0	0	25	0	0	4	0	0	0	0	0	0	25	0	0	4	20	0	0	0	0	0	0	8
29	S	0	0	0	0	0	27	9	0	0	0	0	0	0	0	0	27	0	0	0	22	13	0	0	0	0	0	0
30	S	0	0	0	0	0	25	12	0	0	0	0	0	0	0	0	25	0	0	0	20	16	0	0	0	0	0	0
33	S	0	0	4	0	0	26	0	0	4	0	0	0	0	0	0	26	0	0	4	21	0	0	0	0	4	0	8
35	S	16	4	0	0	4	0	12	0	0	0	0	0	0	16	4	0	0	4	0	0	16	0	0	0	4	0	16
36	S	0	0	0	0	0	25	12	0	0	0	0	0	0	0	0	25	0	0	0	20	16	0	0	0	0	0	0
37	S	0	0	0	0	0	27	4	0	4	0	0	0	0	0	0	27	0	0	0	22	9	0	0	0	0	0	4
39	S	8	5	2	2	0	8	2	0	5	8	0	0	0	0	0	0	0	8	0	2	5	8	0	0	5	8	11
40	S	0	0	0	0	3	13	10	0	3	0	0	0	0	0	3	20	3	0	0	13	17	0	0	6	0	3	0
42	S	8	4	4	0	0	20	0	0	4	0	0	0	0	0	0	20	4	0	8	12	0	0	0	4	0	0	8
43	S	27	5	2	0	5	0	0	0	2	2	0	0	2	22	2	0	0	2	2	0	0	0	0	0	2	0	16
44	S	8	0	4	0	0	25	0	0	4	0	0	0	0	0	0	25	0	0	4	20	0	0	0	0	0	0	8
46	S	0	0	0	7	0	21	10	0	0	0	7	0	0	0	0	21	0	0	0	17	14	0	0	0	0	0	0
47	S	0	0	0	0	0	25	12	0	0	0	0	0	0	0	0	25	0	0	0	20	16	0	0	0	0	0	0
54	S	0	0	0	0	0	37	0	0	0	0	0	0	0	0	0	31	0	0	0	31	0	0	0	0	0	0	0
58	S	27	3	0	0	3	0	0	0	0	0	0	0	0	13	3	0	0	3	0	0	0	0	0	0	0	0	44
59	S	0	0	0	0	0	22	9	0	4	0	0	0	0	0	0	22	0	0	0	18	18	0	0	0	4	0	0
60	S	0	0	0	0	0	25	12	0	0	0	0	0	0	0	0	25	0	0	0	20	16	0	0	0	0	0	0
62	S	0	0	0	0	0	25	12	0	0	0	0	0	0	0	0	25	0	0	0	20	16	0	0	0	0	0	0
63	S	0	0	20	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	20	0	10	0	0	0	30	0	0
64	S	0	0	4	0	0	25	4	0	4	0	0	0	0	0	0	25	0	0	4	20	8	0	0	0	4	0	0
67	S	0	0	0	0	0	25	12	0	0	0	0	0	0	0	0	25	0	0	0	20	16	0	0	0	0	0	0
6	V	0	4	0	0	0	24	12	0	0	0	0	0	0	0	0	24	0	0	4	16	16	0	0	0	0	0	0
13	V	25	4	4	0	0	4	0	0	4	0	0	0	0	0	0	4	20	0	4	0	0	0	0	20	0	0	8
17	V	0	0	0	0	0	21	10	0	3	0	0	0	0	0	0	21	0	0	0	17	14	0	0	0	0	0	10
26	V	0	0	0	4	0	20	16	0	0	0	0	4	0	0	0	20	0	0	0	20	16	0	0	0	0	0	0
34	V	0	6	1	1	0	20	5	1	1	2	0	1	0	0	0	20	0	0	5	14	6	2	0	0	1	0	6
41	V	0	0	0	0	0	25	12	0	0	0	0	0	0	0	0	25	0	0	0	20	16	0	0	0	0	0	0
57	V	24	4	4	0	4	0	0	0	4	0	0	0	0	16	4	0	0	4	4	0	0	0	0	0	4	0	28

ID	LS	ooo	ood	ooc	odo	odd	odc	oco	ocd	occ	doo	dod	doc	ddo	ddd	ddc	dco	dcd	dcc	coo	cod	coc	cdo	cdd	cdc	cco	ccd	ccc
1	H	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	H	0	0	0	0	25	0	0	0	0	0	0	0	25	50	0	0	0	0	0	0	0	0	0	0	0	0	0
19	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	0	0	0	0	25	0	0	0	0	0	0	0	0	50	25	0	0	0	0	0	0	0	0	0	0	0	0
28	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	0	0	0	0	14	0	0	0	0	0	0	0	14	71	0	0	0	0	0	0	0	0	0	0	0	0	0
32	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	0	0	0	0	33	0	0	0	0	0	0	0	0	66	0	0	0	0	0	0	0	0	0	0	0	0	0
48	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	0	0	0	16	0	0	0	0	0	0	0	16	66	0	0	0	0	0	0	0	0	0	0	0	0	0
53	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	33	0	0	33	0	0	0	0	0	0	0	0
55	H	0	0	0	0	12	0	0	0	0	0	0	0	0	25	25	12	12	0	0	0	0	0	12	0	0	0	0
56	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	0	0	0	0	16	0	0	0	0	0	0	0	16	66	0	0	0	0	0	0	0	0	0	0	0	0	0
65	H	0	0	0	0	16	0	0	0	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0
66	H	0	11	0	0	11	0	0	0	0	0	0	0	11	66	0	0	0	0	0	0	0	0	0	0	0	0	0
2	S	0	0	0	0	0	0	0	0	0	0	0	0	0	75	25	0	0	0	0	0	0	0	0	0	0	0	0
3	S	0	0	0	0	0	0	0	0	0	0	0	0	0	40	20	0	20	0	0	0	0	0	20	0	0	0	0
4	S	0	0	0	0	0	0	0	0	0	0	0	0	50	50	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	0	11	0	11	0	0	11	0	11	0	0	11	44	0	0	0	0	0	0	0	0	0	0	0	0	0
8	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0
14	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	S	0	0	0	0	15	0	0	0	0	0	10	0	10	50	5	5	0	0	5	0	0	0	0	0	0	0	0
16	S	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0
29	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	0	0	0	0	50	0	0	0	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0
35	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	0	0	0	20	0	0	0	0	0	0	0	0	40	20	20	0	0	0	0	0	0	0	0	0	0	0
42	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	S	0	14	0	0	14	0	0	0	0	0	0	0	0	71	0	0	0	0	0	0	0	0	0	0	0	0	0
59	S	0	0	0	0	14	0	0	0	0	0	0	0	0	57	14	14	0	0	0	0	0	0	0	0	0	0	0
60	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	0	0	0	0	0	0	0	0	0	0	0	16	16	66	0	0	0	0	0	0	0	0	0	0	0	0	0
26	V	0	0	0	0	25	0	0	0	0	0	0	0	0	25	25	25	0	0	0	0	0	0	0	0	0	0	0
34	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
41	V	0	0	0	0	20	0	0	0	0	0	20	0	0	60	0	0	0	0	0	0	0	0	0	0	0	0	0
57	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	111	112	113	11o	11d	11c	121	122	123	12o	12d	12c	131	132	133	13o	13d	13c	1o1	1o2	1o3	1oo	1od	1oc	1d1	1d2	1d3	1do	1dd	1dc	1c1	1c2	1c3	1co	1cd	1cc
1	H	12	6	6	0	0	0	0	0	12	0	4	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	0	0	0	0	0	0	3	0	18	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	4	0	0	0	0	0	0	26	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	H	0	0	6	0	0	0	6	0	12	0	3	0	12	0	6	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
19	H	0	0	0	0	0	0	0	0	23	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	11	3	3	0	0	0	0	0	14	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	H	0	0	0	0	0	0	0	0	22	0	1	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	H	0	0	0	0	0	0	0	0	22	0	1	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	6	12	6	0	0	0	6	0	6	0	2	0	6	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	H	9	0	4	0	0	0	9	0	14	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	12	0	6	0	0	0	6	6	0	0	4	0	0	0	6	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
32	H	0	4	0	0	0	0	0	0	22	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	H	0	0	3	0	0	0	3	0	19	0	1	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	0	0	0	0	0	0	0	0	20	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
48	H	25	4	4	0	0	0	0	4	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	H	0	0	0	0	0	0	4	0	27	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	H	25	4	4	0	0	0	0	0	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	0	0	0	0	0	0	0	0	0	6	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	H	0	0	0	0	0	0	0	0	23	0	1	0	14	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	H	18	0	9	0	0	0	0	0	0	0	6	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	H	8	0	4	0	0	0	0	0	25	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	0	0	0	0	0	0	0	0	0	0	6	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	H	2	5	7	0	0	0	2	2	5	0	4	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	H	10	0	5	0	0	0	0	0	20	0	3	0	0	0	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	S	0	7	0	0	0	0	0	7	7	0	3	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	S	6	2	4	0	0	0	4	0	14	0	2	0	10	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	S	0	0	0	0	0	0	0	0	33	0	0	0	16	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	9	4	4	0	0	0	0	0	19	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	9	0	0	0	0	0	0	0	0	6	0	9	0	9	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	S	0	0	0	0	0	0	0	0	23	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	0	9	0	0	0	0	0	18	0	0	0	9	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	0	0	0	0	0	0	0	10	0	4	0	25	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	S	0	0	0	0	0	0	0	0	25	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	S	6	3	0	0	0	0	6	3	3	0	7	0	16	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	S	16	0	8	0	0	0	0	0	8	0	5	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	S	0	0	0	0	0	0	0	0	27	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	0	0	0	0	0	0	0	25	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	0	0	5	0	0	0	0	0	21	0	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
35	S	18	4	0	0	0	0	0	4	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	0	0	0	0	0	0	0	25	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	0	0	0	0	0	0	0	27	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	8	5	2	0	0	0	2	0	8	0	0	0	2	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	0	0	0	0	0	0	5	10	0	2	0	15	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	S	8	4	4	0	0	0	0	0	20	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	25	6	3	1	0	0	0	6	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	S	8	0	4	0	0	0	0	0	25	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	0	0	0	0	0	7	0	21	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	S	0	0	0	0	0	0	0	0	25	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	0	0	0	0	0	0	0	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	S	32	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	S	0	0	0	0	0	0	0	0	0	0	5	0	11	0	11	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
60	S	0	0	0	0	0	0	0	0	22	0	1	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	0	0	0	0	0	0	0	0	25	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	0	0	20	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	0	0	4	0	0	0	0	0	22	0	1	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	0	0	0	0	0	0	0	0	25	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	0	4	0	0	0	0	0	0	24	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	25	4	4	0	0	0	0	0	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	0	0	0	0	0	0	0	0	37	0	0	0	18	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	V	0	0	0	0	0	0	0	0	17	0	3	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	V	0	7	0	0	0	0	1	0	19	0	2	0	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
41	V	0	0	0	0	0	0	0	0	0	0	6	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	V	24	4	4	0	0	0	0	4	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	211	212	213	21o	21d	21c	221	222	223	22o	22d	22c	231	232	233	23o	23d	23c	2o1	2o2	2o3	2oo	2od	2oc	2d1	2d2	2d3	2do	2dd	2dc	2c1	2c2	2c3	2co	2cd	2cc
1	H	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	1	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
9	H	0	3	0	0	0	0	0	0	0	0	0	0	18	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	0	0	0	0	0	0	0	0	0	0	0	21	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	H	0	0	0	0	1	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
19	H	0	0	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	0	0	0	0	0	0	0	0	0	0	0	0	3	3	7	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	H	0	0	0	0	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
22	H	0	0	0	0	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
23	H	0	0	6	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0
28	H	0	9	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	0	6	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
32	H	0	0	0	0	0	0	0	0	0	0	0	0	22	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	H	0	3	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
45	H	0	3	3	0	0	0	0	0	0	0	0	0	13	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	H	0	0	0	0	0	0	0	16	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	H	0	4	0	0	0	0	0	0	0	0	0	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	H	4	0	0	0	0	0	0	0	4	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
53	H	0	0	0	0	0	0	0	0	0	0	0	0	19	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
55	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
56	H	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
65	H	0	0	2	0	0	0	0	2	2	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
66	H	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
2	S	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
3	S	2	4	2	0	0	0	0	0	0	0	0	0	8	2	2	0	2	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0
4	S	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	0	0	0	0	0	0	0	0	0	0	0	0	19	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
7	S	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
8	S	0	0	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	4	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
14	S	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	S	0	3	0	1	0	0	0	0	3	0	0	0	6	6	3	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0
16	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
29	S	0	0	0	0	0	0	0	0	0	0	0	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	0	0	0	0	0	0	0	0	0	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
35	S	0	0	0	0	0	0	0	18	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	0	0	0	0	0	0	0	0	0	0	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	8	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	0	0	0	0	0	0	0	5	0	0	0	15	5	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
42	S	0	0	0	0	0	0	0	0	0	0	0	0	20	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	3	0	0	0	0	0	3	25	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
44	S	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	7	0	0	0	0	0	0	0	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	S	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	0	0	0	0	0	0	0	0	0	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	S	0	0	0	0	0	0	0	8	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0
59	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
60	S	0	0	0	0	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
62	S	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	0	0	0	0	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
67	S	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	0	0	0	0	0	0	0	0	0	0	0	0	4	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	V	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	1	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0
34	V	2	0	1	0	0	0	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
41	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
57	V	0	0	0	0	0	0	0	16	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	311	312	313	31o	31d	31c	321	322	323	32o	32d	32c	331	332	333	33o	33d	33c	3o1	3o2	3o3	3oo	3od	3oc	3d1	3d2	3d3	3do	3dd	3dc	3c1	3c2	3c3	3co	3cd	3cc
1	H	6	31	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
9	H	0	14	14	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	21	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
18	H	6	31	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	H	0	19	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	3	7	14	0	0	0	0	0	3	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0
21	H	0	22	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	H	0	22	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	12	6	0	0	0	0	0	0	0	0	1	0	0	0	6	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
28	H	4	9	4	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	0	31	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	H	4	13	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
38	H	3	19	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	0	13	13	0	1	0	3	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	H	4	0	0	0	0	0	0	0	0	0	0	0	4	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	H	0	22	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	H	0	0	0	0	0	0	4	4	8	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	45	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	H	0	23	14	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0
55	H	0	36	0	0	0	0	0	0	0	0	0	0	0	9	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
56	H	4	20	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	0	45	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	H	13	7	13	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
66	H	0	25	5	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
2	S	7	23	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
3	S	2	16	6	0	0	0	2	0	2	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0
4	S	0	11	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
5	S	9	14	0	0	0	0	0	0	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	9	27	18	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0
8	S	0	19	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	4	13	9	0	0	0	4	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	20	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
14	S	0	20	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	S	0	19	12	0	0	0	0	0	6	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	1	2	0	2	1	0	0	0	0	0	0
16	S	8	33	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
29	S	0	22	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	20	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	5	26	0	0	0	0	0	0	0	0	0	0	5	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	S	0	0	18	0	0	0	0	0	0	0	0	0	4	0	9	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
36	S	0	20	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	22	9	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	0	2	5	0	0	0	8	0	0	0	0	0	5	8	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	20	20	0	0	0	0	0	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0
42	S	8	12	0	0	0	0	0	0	4	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	3	0	0	0	0	0	0	0	0	0	0	0	3	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	S	4	20	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	17	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	S	0	20	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	S	0	44	22	0	1	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
60	S	0	22	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	0	20	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	20	0	10	0	0	0	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	4	22	9	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	0	20	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	4	16	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	4	0	0	0	0	0	0	0	20	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	0	0	18	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0	5	0	0	1	0	0	0	0	0	0	0	0
26	V	0	29	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
34	V	4	16	7	0	0	1	2	0	0	0	0	0	1	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	0	36	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	V	4	0	0	0	0	0	0	0	0	0	0	0	4	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	o11	o12	o13	o1o	o1d	o1c	o21	o22	o23	o2o	o2d	o2c	o31	o32	o33	o3o	o3d	o3c	oo1	oo2	oo3	ooo	ood	ooc	od1	od2	od3	odo	odd	odc	oc1	oc2	oc3	oco	ocd	occ
1	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	H	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	H	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	H	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	S	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	S	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
26	V	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	d11	d12	d13	d1o	d1d	d1c	d21	d22	d23	d2o	d2d	d2c	d31	d32	d33	d3o	d3d	d3c	do1	do2	do3	doo	dod	doc	dd1	dd2	dd3	ddo	ddd	ddc	dc1	dc2	dc3	dco	dcd	dcc
1	H	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	H	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	H	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	H	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
28	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	0	0	0	0	0	0	0	0	0	0	1	0	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	H	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	H	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0
48	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	H	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	H	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	H	0	2	1	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	H	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0
2	S	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	S	0	0	0	0	0	0	1	0	0	0	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
4	S	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	S	0	1	1	0	0	0	0	0	1	0	0	0	3	0	0	1	6	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0
16	S	0	1	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	S	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	4	0	0	0	0	0	0	0
59	S	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
26	V	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	V	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	c11	c12	c13	c1o	c1d	c1c	c21	c22	c23	c2o	c2d	c2c	c31	c32	c33	c3o	c3d	c3c	co1	co2	co3	coo	cod	coc	cd1	cd2	cd3	cdo	cdd	cdc	cc1	cc2	cc3	cco	ccd	ccc
1	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	H	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	S	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	V	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 29.

The Features Extracted from the Tracking Mechanism in the Third Online Lesson.

ID	LS	1	2	3	O	D	C	1	2	3	O	D	C	11	12	13	21	22	23	31	32	33	OO	OD	OC	DO	DD	DC	CO	CD	CC	CC
1	H	36	31	31	20	80	0	36	31	31	1	4	0	4	33	0	0	0	33	28	0	0	0	25	0	0	75	0	0	0	0	0
9	H	31	27	41	0	0	0	31	27	41	0	0	0	3	28	0	0	0	28	25	0	14	0	0	0	0	0	0	0	0	0	0
12	H	36	32	32	100	0	0	36	32	32	2	0	0	4	33	0	0	0	33	29	0	0	100	0	0	0	0	0	0	0	0	100
18	H	33	37	29	50	50	0	33	37	29	3	3	0	0	34	0	8	0	30	21	4	0	40	20	0	0	40	0	0	0	0	40
19	H	33	33	33	0	0	0	33	33	33	0	0	0	0	35	0	0	0	35	30	0	0	0	0	0	0	0	0	0	0	0	0
20	H	34	31	34	0	100	0	34	31	34	0	2	0	3	25	6	3	0	29	25	6	0	0	0	0	0	100	0	0	0	0	0
21	H	35	35	30	0	100	0	35	35	30	0	1	0	10	26	0	5	0	31	15	10	0	0	0	0	0	0	0	0	0	0	0
22	H	36	31	31	100	0	0	36	31	31	1	0	0	4	33	0	0	0	33	28	0	0	0	0	0	0	0	0	0	0	0	0
23	H	45	32	22	75	25	0	45	32	22	3	1	0	16	23	6	16	3	13	10	6	3	66	0	0	33	0	0	0	0	0	66
25	H	39	30	30	37	62	0	39	30	30	3	5	0	9	31	0	0	0	31	27	0	0	14	28	0	14	42	0	0	0	0	14
28	H	33	33	33	75	25	0	33	33	33	3	1	0	0	34	0	0	0	34	30	0	0	66	33	0	0	0	0	0	0	0	66
31	H	33	33	33	12	87	0	33	33	33	1	7	0	0	30	4	4	0	30	26	4	0	0	14	0	0	85	0	0	0	0	0
32	H	39	30	30	22	77	0	39	30	30	2	7	0	0	31	9	9	0	22	27	0	0	0	25	0	12	62	0	0	0	0	0
38	H	33	33	33	0	100	0	33	33	33	0	1	0	0	35	0	0	0	35	30	0	0	0	0	0	0	0	0	0	0	0	0
45	H	33	33	33	50	50	0	33	33	33	1	1	0	5	30	0	0	0	35	25	5	0	0	100	0	0	0	0	0	0	0	0
48	H	34	30	34	30	70	0	34	30	34	3	7	0	0	31	4	0	0	31	31	0	0	11	22	0	11	55	0	0	0	0	11
50	H	35	35	30	30	70	0	35	35	30	3	7	0	26	5	5	5	26	5	5	0	21	11	11	0	11	66	0	0	0	0	11
52	H	39	30	30	36	63	0	39	30	30	4	7	0	0	31	4	4	0	27	31	0	0	10	20	0	20	50	0	0	0	0	10
55	H	33	28	38	30	70	0	33	28	38	3	7	0	0	30	5	0	0	30	30	0	5	0	33	0	22	44	0	0	0	0	0
56	H	31	31	36	33	66	0	31	31	36	2	4	0	0	33	0	4	0	28	23	0	9	0	40	0	20	40	0	0	0	0	0
61	H	39	30	30	50	50	0	39	30	30	3	3	0	22	13	4	4	0	27	9	18	0	20	40	0	20	20	0	0	0	0	20
65	H	33	33	33	33	66	0	33	33	33	4	8	0	4	30	0	0	0	34	26	4	0	9	27	0	18	45	0	0	0	0	9
66	H	33	37	29	27	72	0	33	37	29	3	8	0	0	34	0	4	4	30	26	0	0	10	20	0	10	60	0	0	0	0	10
2	S	34	34	30	22	77	0	34	34	30	2	7	0	0	36	0	4	0	31	27	0	0	0	25	0	12	62	0	0	0	0	0
3	S	32	32	35	50	50	0	32	32	35	1	1	0	3	25	3	3	0	29	22	7	3	0	100	0	0	0	0	0	0	0	0
4	S	33	33	33	0	0	0	33	33	33	0	0	0	0	35	0	0	0	35	30	0	0	0	0	0	0	0	0	0	0	0	0
5	S	37	31	31	100	0	0	37	31	31	1	0	0	11	22	4	11	0	20	13	9	6	0	0	0	0	0	0	0	0	0	0
7	S	33	33	33	25	74	0	33	33	33	7	20	0	0	32	1	3	0	30	29	1	1	7	19	0	19	53	0	0	0	0	7
8	S	33	33	33	0	0	0	33	33	33	0	0	0	0	30	3	3	0	30	26	3	0	0	0	0	0	0	0	0	0	0	0
10	S	33	33	33	0	0	0	33	33	33	0	0	0	0	35	0	0	0	35	30	0	0	0	0	0	0	0	0	0	0	0	0
11	S	37	25	37	28	71	0	37	25	37	2	5	0	4	26	8	0	0	26	30	0	4	0	33	0	16	50	0	0	0	0	0
14	S	37	34	27	75	25	0	37	34	27	3	1	0	7	32	0	7	0	28	21	3	0	33	33	0	33	0	0	0	0	0	33
15	S	28	43	28	36	63	0	28	43	28	15	26	0	0	28	0	6	9	26	20	6	1	15	22	0	20	42	0	0	0	0	15
16	S	36	31	31	60	40	0	36	31	31	3	2	0	0	33	4	4	0	28	28	0	0	0	50	0	50	0	0	0	0	0	0
29	S	33	33	33	0	0	0	33	33	33	0	0	0	0	35	0	0	0	35	30	0	0	0	0	0	0	0	0	0	0	0	0
30	S	33	33	33	50	50	0	33	33	33	1	1	0	0	35	0	0	0	35	30	0	0	0	100	0	0	0	0	0	0	0	0
33	S	33	33	33	27	72	0	33	33	33	3	8	0	0	35	0	0	0	35	30	0	0	10	20	0	10	60	0	0	0	0	10
35	S	33	33	33	0	0	0	33	33	33	0	0	0	25	10	0	0	25	10	5	0	25	0	0	0	0	0	0	0	0	0	0
36	S	30	30	38	100	0	0	30	30	38	2	0	0	0	4	24	20	0	12	8	28	4	100	0	0	0	0	0	0	0	0	100
37	S	34	34	30	0	0	0	34	34	30	0	0	0	0	36	0	4	0	31	27	0	0	0	0	0	0	0	0	0	0	0	0
39	S	44	28	28	28	71	0	44	28	28	2	5	0	16	29	0	0	0	29	25	0	0	16	16	0	0	66	0	0	0	0	16
40	S	33	33	33	33	66	0	33	33	33	3	6	0	0	35	0	0	0	35	30	0	0	12	25	0	12	50	0	0	0	0	12
42	S	33	33	33	0	0	0	33	33	33	0	0	0	0	35	0	0	0	35	30	0	0	0	0	0	0	0	0	0	0	0	0
43	S	34	30	34	0	0	0	34	30	34	0	0	0	4	27	4	0	0	31	27	4	0	0	0	0	0	0	0	0	0	0	0
44	S	33	33	33	0	0	0	33	33	33	0	0	0	0	35	0	0	0	35	30	0	0	0	0	0	0	0	0	0	0	0	0
46	S	31	31	36	0	100	0	31	31	36	0	1	0	0	23	9	4	0	28	23	9	0	0	0	0	0	0	0	0	0	0	0
47	S	40	33	26	50	50	0	40	33	26	4	4	0	0	35	0	7	0	28	28	0	0	28	28	0	14	28	0	0	0	0	28
54	S	34	34	30	0	100	0	34	34	30	0	3	0	0	36	0	4	0	31	27	0	0	0	0	0	0	100	0	0	0	0	0
58	S	33	33	33	42	57	0	33	33	33	6	8	0	0	34	0	0	0	34	31	0	0	15	30	0	23	30	0	0	0	0	15
59	S	33	33	33	0	0	0	33	33	33	0	0	0	0	35	0	0	0	35	30	0	0	0	0	0	0	0	0	0	0	0	0
60	S	30	34	34	50	50	0	30	34	34	1	1	0	22	9	0	0	22	13	4	4	22	0	100	0	0	0	0	0	0	0	0
62	S	33	33	33	100	0	0	33	33	33	2	0	0	5	30	0	0	0	35	25	5	0	100	0	0	0	0	0	0	0	0	100
63	S	36	36	27	60	40	0	36	36	27	3	2	0	10	17	8	19	4	13	6	15	4	25	25	0	50	0	0	0	0	0	25
64	S	34	34	30	50	50	0	34	34	30	2	2	0	0	36	0	4	0	31	27	0	0	33	33	0	0	33	0	0	0	0	33
67	S	33	33	33	0	0	0	33	33	33	0	0	0	0	35	0	0	0	35	30	0	0	0	0	0	0	0	0	0	0	0	0
6	V	39	28	32	0	100	0	39	28	32	0	1	0	29	7	3	7	14	3	0	7	25	0	0	0	0	0	0	0	0	0	0
13	V	33	33	33	0	100	0	33	33	33	0	1	0	0	34	0	0	0	34	30	0	0	0	0	0	0	0	0	0	0	0	0
17	V	34	31	34	33	66	0	34	31	34	7	14	0	12	20	2	0	12	20	20	0	12	10	20	0	20	50	0	0	0	0	10
26	V	31	36	31	20	80	0	31	36	31	2	8	0	0	33	0	0	4	33	28	0	0	0	22	0	11	66	0	0	0	0	0
34	V	36	31	31	25	75	0	36	31	31	2	6	0	4	33	0	0	0	33	28	0	0	14	14	0	0	71	0	0	0	0	14
41	V	33	33	33	33	66	0	33	33	33	2	4	0	0	35	0	0	0	35	30	0	0	20	20	0	0	60	0	0	0	0	20
51	V	35	33	30	100	0	0	35	33	30	4	0	0	21	12	0	2	12	19	9	9	12	100	0	0	0	0	0	0	0	0	100
57	V	36	34	28	0	100	0	36	34	28	0	1	0	27	5	2	5	24	5	2	5	21	0	0	0	0	0	0	0	0	0	0

ID	LS	11	12	13	1O	1D	1C	21	22	23	2O	2D	2C	31	32	33	3O	3D	3C	O1	O2	O3	OO	OD	OC	D1	D2	D3	DO	DD	DC	C1	C2	D3	CO	CD	CC
1	H	5	41	0	0	0	0	0	0	23	0	3	0	29	0	0	0	1	0	1	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0
9	H	3	28	0	0	0	0	0	0	28	0	0	0	25	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	4	34	0	0	0	0	0	0	34	0	0	0	26	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	H	0	36	0	1	0	0	10	0	26	0	2	0	21	5	0	0	1	0	1	1	0	1	0	0	1	0	2	0	0	0	0	0	0	0	0	0
19	H	0	35	0	0	0	0	0	0	35	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	3	27	6	0	0	0	3	0	24	0	2	0	27	6	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
21	H	11	27	0	0	0	0	0	0	33	0	1	0	16	11	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
22	H	5	35	0	0	0	0	0	0	35	0	0	0	25	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	14	22	3	2	1	0	18	3	14	0	0	0	11	7	3	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
25	H	12	43	0	0	0	0	0	0	12	0	5	0	31	0	0	1	0	0	2	0	0	1	0	0	0	0	5	0	0	0	0	0	0	0	0	0
28	H	0	35	0	1	0	0	0	0	35	0	1	0	30	0	0	1	0	0	2	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
31	H	0	43	0	0	1	0	6	0	6	0	6	0	37	6	0	0	0	0	1	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0
32	H	0	53	0	0	2	0	7	0	0	1	5	0	38	0	0	1	0	0	2	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0
38	H	0	36	0	0	0	0	0	0	31	0	1	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
45	H	5	31	0	0	0	0	0	0	31	0	1	0	26	5	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
48	H	0	50	7	0	0	0	0	0	7	0	6	0	35	0	0	1	1	0	2	0	0	1	0	0	1	0	6	0	0	0	0	0	0	0	0	0
50	H	26	5	5	0	0	0	5	26	5	0	0	0	5	0	21	1	0	0	0	1	0	0	1	0	0	0	0	1	6	0	0	0	0	0	0	0
52	H	0	53	0	0	1	0	7	0	0	0	6	0	38	0	0	2	0	0	3	0	0	1	0	0	0	0	7	0	0	0	0	0	0	0	0	0
55	H	0	54	0	0	1	0	0	0	0	0	6	0	36	0	9	2	0	0	3	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0
56	H	0	41	0	0	0	0	0	0	23	0	3	0	23	0	11	0	1	0	2	0	0	0	0	0	1	0	2	1	0	0	0	0	0	0	0	0
61	H	23	17	5	1	0	0	5	0	17	0	3	0	5	23	0	1	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
65	H	4	31	0	0	0	0	0	0	36	0	0	0	27	0	0	2	0	0	0	0	0	1	3	0	0	1	0	1	5	0	0	0	0	0	0	0
66	H	0	57	0	0	0	0	7	0	0	0	8	0	35	0	0	1	0	0	2	0	0	1	0	0	0	1	7	0	0	0	0	0	0	0	0	0
2	S	0	53	0	0	0	0	6	0	26	0	3	0	13	0	0	1	4	0	2	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0
3	S	3	26	3	0	0	0	3	0	30	0	0	0	19	7	3	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
4	S	0	35	0	0	0	0	0	0	35	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	11	22	4	0	0	0	11	0	20	0	0	0	13	9	6	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	52	0	0	1	0	0	0	7	1	17	0	39	0	0	3	2	0	5	0	0	2	0	0	0	1	18	1	0	0	0	0	0	0	0	0
8	S	0	30	3	0	0	0	3	0	30	0	0	0	26	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	35	0	0	0	0	0	0	35	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	35	5	1	1	0	0	0	17	0	3	0	35	0	5	0	1	0	2	0	0	0	0	0	1	0	4	0	0	0	0	0	0	0	0	0
14	S	4	36	0	1	0	0	8	0	28	0	1	0	24	0	0	1	0	0	2	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
15	S	0	54	0	0	1	0	3	12	0	1	21	0	16	12	0	5	4	0	9	0	0	6	0	0	3	3	18	2	0	0	0	0	0	0	0	0
16	S	0	38	5	0	0	0	5	0	22	0	2	0	27	0	0	2	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
29	S	0	35	0	0	0	0	0	0	35	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	36	0	0	0	0	0	0	31	0	1	0	31	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
33	S	0	54	0	0	1	0	0	0	0	1	6	0	45	0	0	1	0	0	1	0	1	0	1	0	0	1	6	1	0	0	0	0	0	0	0	0
35	S	25	10	0	0	0	0	0	25	10	0	0	0	5	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	4	20	1	0	0	20	0	12	0	0	0	8	29	4	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	36	0	0	0	0	4	0	31	0	0	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	21	36	0	0	0	0	0	0	10	0	5	0	31	0	0	0	0	0	1	0	0	1	0	0	0	0	5	0	0	0	0	0	0	0	0	0
40	S	0	53	0	0	0	0	0	0	7	0	6	0	38	0	0	1	0	0	2	0	0	1	0	0	0	0	6	0	0	0	0	0	0	0	0	0
42	S	0	35	0	0	0	0	0	0	35	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	4	27	4	0	0	0	0	0	31	0	0	0	27	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	S	0	35	0	0	0	0	0	0	35	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	25	10	0	0	0	5	0	25	0	1	0	25	10	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
47	S	0	55	0	0	0	0	11	0	0	0	4	0	33	0	0	1	0	0	2	0	0	2	0	0	0	0	4	0	0	0	0	0	0	0	0	0
54	S	0	42	0	0	0	0	5	0	21	0	3	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
58	S	0	45	0	0	0	0	0	0	24	0	7	0	30	0	0	3	1	0	5	0	0	1	0	0	0	0	7	1	0	0	0	0	0	0	0	0
59	S	0	35	0	0	0	0	0	0	35	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	S	23	9	0	0	0	0	0	23	9	0	1	0	4	4	23	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
62	S	5	30	0	0	0	0	0	0	35	0	0	0	25	5	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	11	19	7	0	1	0	19	4	14	1	0	0	4	16	2	1	1	0	2	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0
64	S	0	42	0	0	0	0	5	0	26	0	2	0	26	0	0	1	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
67	S	0	35	0	0	0	0	0	0	35	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	26	7	3	0	1	0	7	15	3	0	0	0	0	7	26	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
13	V	0	36	0	0	0	0	0	0	31	0	1	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17	V	20	33	0	0	1	0	0	20	12	0	5	0	12	0	0	4	7	0	4	0	0	2	0	0	2	0	11	0	1	0	0	0	0	0	0	0
26	V	0	58	0	0	0	0	0	0	8	0	7	0	33	0	0	1	1	0	2	0	0	0	0	0	1	1	6	0	0	0	0	0	0	0	0	0
34	V	0	50	0	1	0	0	0	0	7	0	6	0	42	0	0	0	0	0	2	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
41	V	0	43	0	0	0	0	0	0	18	0	4	0	37	0	0	0	0	0	1	0	0	1	0	0	0	0	4	0	0	0	0	0	0	0	0	0
51	V	20	12	0	1	0	0	2	12	20	0	0	0	7	10	12	1	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	V	27	5	2	0	0	0	5	25	5	0	0	0	2	5	19	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

ID	LS	111	112	113	121	122	123	131	132	133	211	212	213	221	222	223	231	232	233	311	312	313	321	322	323	331	332	333
1	H	0	5	0	0	0	35	0	0	0	0	0	0	0	0	0	30	0	0	5	25	0	0	0	0	0	0	0
9	H	0	3	0	0	0	29	0	0	0	0	0	0	0	0	0	25	0	3	3	22	0	0	0	0	0	0	11
12	H	0	4	0	0	0	34	0	0	0	0	0	0	0	0	0	30	0	0	4	26	0	0	0	0	0	0	0
18	H	0	0	0	4	0	31	0	0	0	0	9	0	0	0	0	22	4	0	0	22	0	4	0	0	0	0	0
19	H	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	31	0	0	0	31	0	0	0	0	0	0	0
20	H	0	0	3	0	0	26	6	0	0	0	0	3	0	0	0	20	6	0	3	23	0	3	0	3	0	0	0
21	H	5	5	0	5	0	22	0	0	0	5	0	0	0	0	0	16	11	0	0	16	0	0	0	11	0	0	0
22	H	0	5	0	0	0	35	0	0	0	0	0	0	0	0	0	30	0	0	5	25	0	0	0	0	0	0	0
23	H	6	6	3	17	0	6	6	0	0	10	3	3	0	0	3	3	3	3	0	10	0	0	3	3	0	3	0
25	H	4	4	0	0	0	33	0	0	0	0	0	0	0	0	0	28	0	0	4	23	0	0	0	0	0	0	0
28	H	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	31	0	0	0	31	0	0	0	0	0	0	0
31	H	0	0	0	4	0	27	0	0	0	0	0	4	0	0	0	27	4	0	0	27	0	0	0	4	0	0	0
32	H	0	0	0	9	0	23	9	0	0	0	0	9	0	0	0	19	0	0	0	28	0	0	0	0	0	0	0
38	H	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	31	0	0	0	31	0	0	0	0	0	0	0
45	H	0	5	0	0	0	31	0	0	0	0	0	0	0	0	0	26	5	0	0	26	0	0	0	5	0	0	0
48	H	0	0	0	0	0	33	4	0	0	0	0	0	0	0	0	28	0	0	0	28	4	0	0	0	0	0	0
50	H	22	5	0	0	5	0	5	0	0	0	0	5	0	22	5	0	0	5	5	0	0	0	0	0	0	0	16
52	H	0	0	0	4	0	28	4	0	0	0	0	4	0	0	0	28	0	0	0	28	0	0	0	0	0	0	0
55	H	0	0	0	0	0	31	5	0	0	0	0	0	0	0	0	26	0	5	0	26	5	0	0	0	0	0	0
56	H	0	0	0	5	0	30	0	0	0	0	5	0	0	0	0	20	0	5	0	25	0	0	0	0	5	0	5
61	H	14	9	0	0	0	14	0	4	0	0	0	4	0	0	0	9	14	0	4	4	0	4	0	14	0	0	0
65	H	0	4	0	0	0	31	0	0	0	0	0	0	0	0	0	27	4	0	4	22	0	0	0	4	0	0	0
66	H	0	0	0	4	4	27	0	0	0	0	4	0	0	0	4	27	0	0	0	27	0	0	0	0	0	0	0
2	S	0	0	0	4	0	33	0	0	0	0	4	0	0	0	0	28	0	0	0	28	0	0	0	0	0	0	0
3	S	0	3	0	0	0	26	0	3	0	0	3	0	0	0	0	19	3	3	3	15	3	3	0	3	3	0	0
4	S	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	31	0	0	0	31	0	0	0	0	0	0	0
5	S	6	4	0	4	0	18	0	0	2	2	4	4	0	0	0	11	4	4	2	11	0	6	0	2	2	4	0
7	S	0	0	0	1	0	31	1	0	0	0	3	0	0	0	0	26	1	1	0	27	1	1	0	0	1	0	0
8	S	0	0	0	4	0	28	4	0	0	0	0	4	0	0	0	24	4	0	0	28	0	0	0	4	0	0	0
10	S	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	31	0	0	0	31	0	0	0	0	0	0	0
11	S	0	4	0	0	0	27	4	0	4	0	0	0	0	0	0	22	0	0	4	22	4	0	0	0	4	0	0
14	S	3	3	0	3	0	29	0	0	0	3	3	0	0	0	0	22	3	0	0	22	0	3	0	0	0	0	0
15	S	0	0	0	6	3	19	0	0	0	0	6	0	0	4	4	19	6	1	0	20	0	0	1	3	1	0	0
16	S	0	0	0	5	0	30	5	0	0	0	0	5	0	0	0	25	0	0	0	30	0	0	0	0	0	0	0
29	S	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	31	0	0	0	31	0	0	0	0	0	0	0
30	S	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	31	0	0	0	31	0	0	0	0	0	0	0
33	S	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	31	0	0	0	31	0	0	0	0	0	0	0
35	S	21	5	0	0	5	5	0	0	0	0	0	0	0	21	5	5	0	5	5	0	0	0	0	0	0	0	21
36	S	0	0	0	0	0	4	0	25	0	0	0	16	0	0	0	8	0	4	0	4	4	20	0	8	0	4	0
37	S	0	0	0	4	0	33	0	0	0	0	4	0	0	0	0	28	0	0	0	28	0	0	0	0	0	0	0
39	S	13	4	0	0	0	30	0	0	0	0	0	0	0	0	0	26	0	0	4	21	0	0	0	0	0	0	0
40	S	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	31	0	0	0	31	0	0	0	0	0	0	0
42	S	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	31	0	0	0	31	0	0	0	0	0	0	0
43	S	0	4	0	0	0	28	0	4	0	0	0	0	0	0	0	28	0	0	4	19	4	0	0	4	0	0	0
44	S	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	31	0	0	0	31	0	0	0	0	0	0	0
46	S	0	0	0	0	0	25	0	10	0	0	5	0	0	0	0	25	0	0	0	15	10	5	0	5	0	0	0
47	S	0	0	0	7	0	30	0	0	0	0	7	0	0	0	0	30	0	0	0	23	0	0	0	0	0	0	0
54	S	0	0	0	4	0	33	0	0	0	0	4	0	0	0	0	28	0	0	0	28	0	0	0	0	0	0	0
58	S	0	0	0	0	0	34	0	0	0	0	0	0	0	0	0	32	0	0	0	32	0	0	0	0	0	0	0
59	S	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	31	0	0	0	31	0	0	0	0	0	0	0
60	S	19	4	0	0	4	4	0	0	0	0	0	0	0	19	4	4	4	4	4	0	0	0	0	4	0	0	19
62	S	0	5	0	0	0	31	0	0	0	0	0	0	0	0	0	26	5	0	5	21	0	0	0	5	0	0	0
63	S	0	8	2	2	2	13	2	6	0	11	2	6	2	2	0	4	2	4	0	6	0	15	0	0	0	4	0
64	S	0	0	0	4	0	33	0	0	0	0	4	0	0	0	0	28	0	0	0	28	0	0	0	0	0	0	0
67	S	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	31	0	0	0	31	0	0	0	0	0	0	0
6	V	23	3	3	0	0	3	0	0	3	7	0	0	3	11	0	0	0	3	0	0	0	3	3	0	0	7	19
13	V	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	31	0	0	0	31	0	0	0	0	0	0	0
17	V	10	2	0	0	2	17	2	0	0	0	0	0	0	10	2	17	0	2	2	15	2	0	0	0	0	0	10
26	V	0	0	0	0	5	30	0	0	0	0	0	0	0	0	5	30	0	0	0	30	0	0	0	0	0	0	0
34	V	0	5	0	0	0	35	0	0	0	0	0	0	0	0	0	30	0	0	5	25	0	0	0	0	0	0	0
41	V	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	31	0	0	0	31	0	0	0	0	0	0	0
51	V	15	5	0	0	2	10	0	0	0	2	0	0	2	7	2	10	7	2	5	5	0	0	2	7	0	2	10
57	V	22	2	2	0	2	2	0	2	0	2	0	0	2	19	2	2	0	2	2	0	0	2	2	0	0	2	19

ID	LS	ooo	ood	ooc	odo	odd	odc	oco	ocd	occ	doo	dod	doc	ddo	ddd	ddc	dco	dcd	dcc	coo	cod	coc	cdo	cdd	cdc	cco	ccd	ccc
1	H	0	0	0	0	33	0	0	0	0	0	0	0	0	66	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	H	25	25	0	0	25	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0
19	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	50	0	0	0	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	H	0	16	0	16	16	0	0	0	0	0	16	0	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0
28	H	50	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	0	0	0	0	16	0	0	0	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0
32	H	0	0	0	14	14	0	0	0	0	0	14	0	0	57	0	0	0	0	0	0	0	0	0	0	0	0	0
38	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	H	0	12	0	12	12	0	0	0	0	0	12	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0
50	H	0	12	0	0	12	0	0	0	0	0	0	0	12	62	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	11	0	11	11	0	0	0	0	0	11	0	11	44	0	0	0	0	0	0	0	0	0	0	0	0	0
55	H	0	0	0	12	25	0	0	0	0	0	25	0	12	25	0	0	0	0	0	0	0	0	0	0	0	0	0
56	H	0	0	0	25	25	0	0	0	0	0	25	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	0	25	0	25	25	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	H	0	10	0	10	10	0	0	0	0	10	10	0	10	40	0	0	0	0	0	0	0	0	0	0	0	0	0
66	H	0	11	0	0	22	0	0	0	0	0	11	0	11	44	0	0	0	0	0	0	0	0	0	0	0	0	0
2	S	0	0	0	14	14	0	0	0	0	0	14	0	0	57	0	0	0	0	0	0	0	0	0	0	0	0	0
3	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	8	0	4	16	0	0	0	0	8	12	0	16	36	0	0	0	0	0	0	0	0	0	0	0	0	0
8	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	0	0	0	40	0	0	0	0	0	20	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0
14	S	0	0	0	50	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	S	5	10	0	7	15	0	0	0	0	7	12	0	12	28	0	0	0	0	0	0	0	0	0	0	0	0	0
16	S	0	0	0	66	0	0	0	0	0	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	0	11	0	11	11	0	0	0	0	11	0	0	0	55	0	0	0	0	0	0	0	0	0	0	0	0	0
35	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	0	20	0	0	20	0	0	0	0	0	0	0	0	60	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	14	0	14	14	0	0	0	0	0	14	0	0	42	0	0	0	0	0	0	0	0	0	0	0	0	0
42	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	S	0	33	0	16	16	0	0	0	0	16	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0
58	S	8	8	0	16	16	0	0	0	0	0	25	0	8	16	0	0	0	0	0	0	0	0	0	0	0	0	0
59	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	0	0	0	33	0	0	0	0	0	33	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	0	50	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	0	10	0	10	10	0	0	0	0	10	5	0	10	42	0	0	0	0	0	0	0	0	0	0	0	0	0
26	V	0	0	0	0	25	0	0	0	0	0	12	0	12	50	0	0	0	0	0	0	0	0	0	0	0	0	0
34	V	0	16	0	0	16	0	0	0	0	0	0	0	0	66	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	0	25	0	0	25	0	0	0	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0
51	V	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	111	112	113	11o	11d	11c	121	122	123	12o	12d	12c	131	132	133	13o	13d	13c	1o1	1o2	1o3	1oo	1od	1oc	1d1	1d2	1d3	1do	1dd	1dc	1c1	1c2	1c3	1co	1cd	1cc
1	H	0	8	0	0	0	0	0	0	33	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	0	3	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	4	0	0	0	0	0	0	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	H	0	0	0	0	0	0	6	0	26	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	H	0	0	0	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	0	0	3	0	0	0	0	0	23	0	2	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	H	6	6	0	0	0	0	0	0	25	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	H	0	5	0	0	0	0	0	0	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	8	4	4	0	0	0	17	0	8	0	0	0	4	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
25	H	10	10	0	0	0	0	0	0	20	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	H	0	0	0	0	0	0	0	0	41	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	0	0	0	0	0	0	11	0	11	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
32	H	0	0	0	0	0	0	16	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
38	H	0	0	0	0	0	0	0	0	35	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	0	5	0	0	0	0	0	0	29	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	H	0	0	0	0	0	0	0	0	14	0	6	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	H	22	5	0	0	0	0	0	5	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	0	0	0	0	0	16	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
55	H	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
56	H	0	0	0	0	0	0	0	0	33	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	23	7	0	0	0	0	0	0	0	0	3	0	0	7	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	H	0	5	0	0	0	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	H	0	0	0	0	0	0	14	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	S	0	0	0	0	0	0	12	0	50	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	S	0	4	0	0	0	0	0	0	29	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	S	0	0	0	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	6	4	0	0	0	0	4	0	18	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	0	0	0	0	0	0	0	15	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8	S	0	0	0	0	0	0	4	0	28	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	0	0	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	0	0	0	0	0	0	0	27	0	3	0	0	0	9	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
14	S	0	0	0	1	0	0	4	0	31	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	S	0	0	0	0	0	0	9	0	0	1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
16	S	0	0	0	0	0	0	7	0	28	0	2	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	S	0	0	0	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	0	0	0	0	0	0	0	35	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	0	0	0	0	0	0	0	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
35	S	21	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	0	0	0	0	0	0	0	4	0	0	0	0	22	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	0	0	0	0	0	4	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	23	7	0	0	0	0	0	0	15	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	0	0	0	0	0	0	0	14	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	S	0	0	0	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	0	4	0	0	0	0	0	0	28	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	S	0	0	0	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	0	0	0	0	0	0	0	22	0	1	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	S	0	0	0	0	0	0	25	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	0	0	0	0	0	6	0	26	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	S	0	0	0	0	0	0	0	0	33	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	S	0	0	0	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	S	21	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	0	5	0	0	0	0	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	0	10	0	0	1	0	2	2	15	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
64	S	0	0	0	0	0	0	6	0	33	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	0	0	0	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	20	4	0	0	1	0	0	0	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
13	V	0	0	0	0	0	0	0	0	35	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	25	6	0	0	0	0	0	6	12	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
26	V	0	0	0	0	0	0	0	0	20	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	V	0	0	0	0	0	0	0	0	14	0	6	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	0	0	0	0	0	0	0	0	27	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	V	13	2	0	1	0	0	0	2	11	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	V	23	2	2	0	0	0	0	2	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	211	212	213	21o	21d	21c	221	222	223	22o	22d	22c	231	232	233	23o	23d	23c	2o1	2o2	2o3	2oo	2od	2oc	2d1	2d2	2d3	2do	2dd	2dc	2c1	2c2	2c3	2co	2cd	2cc
1	H	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
9	H	0	0	0	0	0	0	0	0	0	0	0	0	25	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	0	0	0	0	0	0	0	0	0	0	0	28	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	H	0	13	0	0	0	0	0	0	0	0	0	0	26	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
19	H	0	0	0	0	0	0	0	0	0	0	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	0	0	3	0	0	0	0	0	0	0	0	0	15	7	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
21	H	0	0	0	0	0	0	0	0	0	0	0	0	18	12	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
22	H	0	0	0	0	0	0	0	0	0	0	0	0	27	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	8	4	0	1	1	0	0	0	4	0	0	0	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	H	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
28	H	0	0	0	0	0	0	0	0	0	0	0	0	29	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
31	H	0	0	0	0	1	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
32	H	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
38	H	0	0	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
45	H	0	0	0	0	0	0	0	0	0	0	0	0	23	5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
48	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
50	H	0	0	5	0	0	0	0	22	5	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
55	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
56	H	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	1	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0
61	H	0	0	7	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
65	H	0	0	0	0	0	0	0	0	0	0	0	0	30	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	H	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7	0	0	0	0	0	0	0	0	0
2	S	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
3	S	0	4	0	0	0	0	0	0	0	0	0	0	20	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	S	0	0	0	0	0	0	0	0	0	0	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	2	4	4	0	0	0	0	0	0	0	0	0	11	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	1	0	0	0	0	1	0	0	0	0	16	1	0	0	0	0	0	0	0	0
8	S	0	0	4	0	0	0	0	0	0	0	0	0	24	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	0	0	0	0	0	0	0	0	0	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
14	S	4	4	0	0	0	0	0	0	0	0	0	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
15	S	0	9	0	0	0	0	0	27	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2	2	17	0	0	0	0	0	0	0	0	0
16	S	0	0	7	0	0	0	0	0	0	0	0	0	14	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
29	S	0	0	0	0	0	0	0	0	0	0	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	0	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
33	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	6	0	0	0	0	0	0	0	0	0
35	S	0	0	0	0	0	0	0	21	5	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	0	13	1	0	0	0	0	0	0	0	0	9	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	4	0	0	0	0	0	0	0	0	0	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
40	S	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
42	S	0	0	0	0	0	0	0	0	0	0	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	0	0	0	0	0	0	0	0	0	0	0	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	S	0	0	0	0	0	0	0	0	0	0	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	5	0	0	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
47	S	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
54	S	0	6	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
58	S	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	1	1	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0
59	S	0	0	0	0	0	0	0	0	0	0	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	S	0	0	0	0	0	0	0	21	5	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
62	S	0	0	0	0	0	0	0	0	0	0	0	0	26	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	10	2	7	0	0	0	2	2	0	0	0	0	5	2	2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	0	6	0	0	0	0	0	0	0	0	0	0	20	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
67	S	0	0	0	0	0	0	0	0	0	0	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	8	0	0	0	0	0	4	12	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	0	0	0	0	0	0	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17	V	0	0	0	0	0	0	0	25	6	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
26	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	6	0	0	0	0	0	0	0	0	0
34	V	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
41	V	0	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
51	V	2	0	0	0	0	0	2	8	2	0	0	0	8	8	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	V	2	0	0	0	0	0	2	20	2	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	311	312	313	31o	31d	31c	321	322	323	32o	32d	32c	331	332	333	33o	33d	33c	3o1	3o2	3o3	3oo	3od	3oc	3d1	3d2	3d3	3do	3dd	3dc	3c1	3c2	3c3	3co	3cd	3cc
1	H	8	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
9	H	3	22	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	H	0	20	0	1	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
19	H	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	3	26	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	H	0	18	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	H	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	0	8	0	1	0	0	0	4	4	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	H	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	H	0	29	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	0	66	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	H	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	H	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	0	29	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	H	0	57	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
50	H	5	0	0	0	0	0	0	0	0	0	0	0	0	0	16	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	H	0	100	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	H	0	33	0	0	0	0	0	0	0	0	0	0	8	0	8	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
61	H	7	0	0	0	0	0	7	0	23	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	H	5	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
66	H	0	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	S	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
3	S	0	16	4	0	0	0	4	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
4	S	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	2	11	0	0	0	0	6	0	2	0	0	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0
8	S	0	28	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	45	0	1	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
14	S	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	S	0	45	0	0	0	0	0	9	0	0	2	0	0	0	0	0	0	0	3	0	0	2	0	0	1	0	1	2	0	0	0	0	0	0	0	0
16	S	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	S	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	0	100	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	S	5	0	0	0	0	0	0	0	0	0	0	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	4	4	0	0	0	22	0	9	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	7	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	S	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	4	19	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	S	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	16	11	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	S	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	S	0	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
59	S	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	S	5	0	0	0	0	0	0	0	0	0	1	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	5	21	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	0	5	0	0	0	0	15	0	0	1	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
64	S	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	0	0	0	0	0	0	4	4	0	0	0	0	0	8	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	2	0	4	0	1	0	0	0	0	0	0	0
26	V	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
34	V	0	71	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	0	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	V	5	2	0	0	0	0	0	2	8	0	0	0	0	2	11	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	V	2	0	0	0	0	0	2	2	0	0	0	0	0	0	17	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

ID	LS	o11	o12	o13	o1o	o1d	o1c	o21	o22	o23	o2o	o2d	o2c	o31	o32	o33	o3o	o3d	o3c	oo1	oo2	oo3	ooo	ood	ooc	od1	od2	od3	odo	odd	odc	oc1	oc2	oc3	oco	ocd	occ
1	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	H	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	H	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	H	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	H	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	H	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	H	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	H	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
52	H	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	H	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	H	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0
66	H	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	S	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	S	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	S	0	8	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	S	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
35	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	S	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	S	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	V	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	V	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	V	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	d11	d12	d13	d1o	d1d	d1c	d21	d22	d23	d2o	d2d	d2c	d31	d32	d33	d3o	d3d	d3c	do1	do2	do3	doo	dod	doc	dd1	dd2	dd3	ddo	ddd	ddc	dc1	dc2	dc3	dco	dcd	dcc
1	H	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	H	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	H	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	H	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	H	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	H	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	H	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	H	0	1	0	0	0	0	0	0	0	0	0	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0	0	0	0	0	0	0
52	H	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	H	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	H	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	H	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	4	0	0	0	0	0	0	0
66	H	0	0	0	0	0	0	0	0	0	0	1	0	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	S	0	3	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	0	0	0	0	0	0	0	0	1	0	0	13	0	0	3	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	0	0	0	1	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	S	0	3	0	0	0	0	0	0	0	0	3	0	5	4	0	5	4	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	S	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	0	0	0	0	0	0	0	0	0	0	1	0	5	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	S	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	S	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	0	2	0	0	0	0	0	0	0	0	0	0	3	0	0	4	4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
26	V	0	1	0	0	0	0	0	0	0	0	1	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	V	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	V	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID	LS	c11	c12	c13	c1o	c1d	c1c	c21	c22	c23	c2o	c2d	c2c	c31	c32	c33	c3o	c3d	c3c	co1	co2	co3	coo	cod	coc	cd1	cd2	cd3	cdo	cdd	cdc	cc1	cc2	cc3	cco	ccd	ccc
1	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX D: CORRELATIONS

Table 30.

The Correlations between the Study Preference Questionnaire and the 39 Classifiers (13 Classifiers per Lesson) for the Three Online Lessons of the Classification System

			Q	The First Online Lesson												
				C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}
Q		r	1	0.099	0.096	0.004	-0.236	-.358	-0.149	0.182	0.088	.300	0.114	-0.022	0.181	0.115
		ρ		0.436	0.450	0.974	0.061	0.004	0.240	0.151	0.489	0.016	0.369	0.860	0.153	0.364
		N	67	64	64	64	64	64	64	64	64	64	64	64	64	64
The First Online Lesson	C_1	r	0.099	1	.482	0.103	0.134	-.291	0.150	.483	-0.027	.400	0.243	.273	0.121	0.058
		ρ	0.436		0.000	0.419	0.291	0.020	0.237	0.000	0.831	0.001	0.053	0.029	0.341	0.648
		N	64	64	64	64	64	64	64	64	64	64	64	64	64	64
	C_2	r	0.096	.482	1	.326	0.170	-0.135	0.144	.384	0.044	.368	.340	.472	.250	.291
		ρ	0.450	0.000		0.009	0.178	0.286	0.256	0.002	0.729	0.003	0.006	0.000	0.047	0.019
		N	64	64	64	64	64	64	64	64	64	64	64	64	64	64
	C_3	r	0.004	0.103	.326	1	.428	0.002	.267	.248	0.114	0.232	.347	0.205	-0.021	0.141
		ρ	0.974	0.419	0.009		0.000	0.986	0.033	0.048	0.372	0.065	0.005	0.103	0.872	0.266
		N	64	64	64	64	64	64	64	64	64	64	64	64	64	64
	C_4	r	-0.236	0.134	0.170	.428	1	.335	.298	.262	-0.069	0.115	0.124	0.075	0.090	-0.159
		ρ	0.061	0.291	0.178	0.000		0.007	0.017	0.037	0.587	0.365	0.330	0.556	0.480	0.209
		N	64	64	64	64	64	64	64	64	64	64	64	64	64	64
	C_5	r	-.358	-.291	-0.135	0.002	.335	1	0.143	-0.085	-0.004	-.318	-0.079	-0.082	-0.046	-0.161
		ρ	0.004	0.020	0.286	0.986	0.007		0.259	0.506	0.975	0.011	0.537	0.522	0.717	0.203
		N	64	64	64	64	64	64	64	64	64	64	64	64	64	64
	C_6	r	-0.149	0.150	0.144	.267	.298	0.143	1	0.164	-0.020	0.092	0.027	-0.013	-0.239	-0.160
		ρ	0.240	0.237	0.256	0.033	0.017	0.259		0.196	0.873	0.469	0.831	0.920	0.058	0.206
		N	64	64	64	64	64	64	64	64	64	64	64	64	64	64
	C_7	r	0.182	.483	.384	.248	.262	-0.085	0.164	1	0.091	.255	.326	.405	0.151	-0.175
		ρ	0.151	0.000	0.002	0.048	0.037	0.506	0.196		0.472	0.042	0.009	0.001	0.234	0.167
		N	64	64	64	64	64	64	64	64	64	64	64	64	64	64
	C_8	r	0.088	-0.027	0.044	0.114	-0.069	-0.004	-0.020	0.091	1	0.187	0.167	0.145	0.091	-0.071
		ρ	0.489	0.831	0.729	0.372	0.587	0.975	0.873	0.472		0.138	0.188	0.252	0.473	0.579
		N	64	64	64	64	64	64	64	64	64	64	64	64	64	64
	C_9	r	.300	.400	.368	0.232	0.115	-.318	0.092	.255	0.187	1	0.196	.300	0.113	0.160
		ρ	0.016	0.001	0.003	0.065	0.365	0.011	0.469	0.042	0.138		0.120	0.016	0.373	0.206
		N	64	64	64	64	64	64	64	64	64	64	64	64	64	64
	C_{10}	r	0.114	0.243	.340	.347	0.124	-0.079	0.027	.326	0.167	0.196	1	.314	0.140	0.226
		ρ	0.369	0.053	0.006	0.005	0.330	0.537	0.831	0.009	0.188	0.120		0.011	0.269	0.073
		N	64	64	64	64	64	64	64	64	64	64	64	64	64	64
	C_{11}	r	-0.022	.273	.472	0.205	0.075	-0.082	-0.013	.405	0.145	.300	.314	1	0.198	-0.009
		ρ	0.860	0.029	0.000	0.103	0.556	0.522	0.920	0.001	0.252	0.016	0.011		0.116	0.945
		N	64	64	64	64	64	64	64	64	64	64	64	64	64	64
	C_{12}	r	0.181	0.121	.250	-0.021	0.090	-0.046	-0.239	0.151	0.091	0.113	0.140	0.198	1	0.183
		ρ	0.153	0.341	0.047	0.872	0.480	0.717	0.058	0.234	0.473	0.373	0.269	0.116		0.148
		N	64	64	64	64	64	64	64	64	64	64	64	64	64	64
	C_{13}	r	0.115	0.058	.291	0.141	-0.159	-0.161	-0.160	-0.175	-0.071	0.160	0.226	-0.009	0.183	1
		ρ	0.364	0.648	0.019	0.266	0.209	0.203	0.206	0.167	0.579	0.206	0.073	0.945	0.148	
		N	64	64	64	64	64	64	64	64	64	64	64	64	64	64

			Q	The Second Online Lesson												
				C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}
Q		r	1	0.072	-0.246	0.006	0.093	-0.072	-0.006	0.084	-0.133	-0.131	0.133	0.061	0.010	-0.017
		ρ		0.576	0.052	0.962	0.471	0.575	0.965	0.511	0.297	0.306	0.298	0.634	0.935	0.896
		N	67	63	63	63	63	63	63	63	63	63	63	63	63	63
The First Online Lesson	C_1	r	0.099	0.250	.269	-0.194	-0.084	0.038	-0.195	0.056	-0.126	0.079	-0.107	-0.043	0.044	0.043
		ρ	0.436	0.054	0.038	0.138	0.523	0.775	0.136	0.668	0.336	0.548	0.416	0.747	0.739	0.746
		N	64	60	60	60	60	60	60	60	60	60	60	60	60	60
	C_2	r	0.096	0.155	-0.003	0.171	-0.078	0.097	0.049	-0.077	0.112	-0.097	0.024	-0.092	0.006	0.191
		ρ	0.450	0.238	0.982	0.191	0.551	0.460	0.712	0.557	0.394	0.460	0.855	0.485	0.965	0.144
		N	64	60	60	60	60	60	60	60	60	60	60	60	60	60
	C_3	r	0.004	-0.205	-0.182	.257	0.047	-0.038	0.129	-.331	-0.002	-0.014	-0.103	-.264	-0.226	-0.010
		ρ	0.974	0.116	0.164	0.048	0.721	0.775	0.328	0.010	0.985	0.917	0.432	0.041	0.083	0.942
		N	64	60	60	60	60	60	60	60	60	60	60	60	60	60
	C_4	r	-0.236	-0.121	-0.076	0.158	-0.041	0.045	0.095	-0.044	0.139	-0.020	0.024	-.262	-0.138	-0.137
		ρ	0.061	0.358	0.562	0.228	0.755	0.732	0.470	0.741	0.291	0.880	0.854	0.043	0.292	0.295
		N	64	60	60	60	60	60	60	60	60	60	60	60	60	60
	C_5	r	-.358	-.254	-0.050	0.178	-0.024	0.186	0.163	-0.152	0.161	0.030	0.054	-0.103	0.137	0.103
		ρ	0.004	0.050	0.706	0.173	0.856	0.154	0.212	0.248	0.219	0.822	0.682	0.435	0.298	0.432
		N	64	60	60	60	60	60	60	60	60	60	60	60	60	60
	C_6	r	-0.149	-0.103	-0.207	.279	0.240	.280	0.217	-0.129	0.024	-0.197	-0.123	-.259	-0.125	-0.017
		ρ	0.240	0.433	0.112	0.031	0.065	0.030	0.096	0.327	0.857	0.131	0.350	0.046	0.341	0.898
		N	64	60	60	60	60	60	60	60	60	60	60	60	60	60
	C_7	r	0.182	0.113	-0.049	-0.041	-0.158	0.007	-0.131	-0.198	0.174	-0.024	-0.078	0.089	0.078	-0.056
		ρ	0.151	0.392	0.708	0.754	0.229	0.955	0.318	0.129	0.184	0.857	0.553	0.499	0.552	0.669
		N	64	60	60	60	60	60	60	60	60	60	60	60	60	60
	C_8	r	0.088	-0.012	0.114	-.359	-0.104	-0.119	-0.176	0.051	-0.080	0.199	-.277	-0.097	-0.038	-0.187
		ρ	0.489	0.927	0.387	0.005	0.430	0.364	0.179	0.698	0.542	0.128	0.032	0.460	0.771	0.152
		N	64	60	60	60	60	60	60	60	60	60	60	60	60	60
	C_9	r	.300	0.239	-0.209	-0.058	-0.139	-0.129	-0.125	-0.019	-0.030	-0.159	-0.170	-0.131	-0.158	-0.124
		ρ	0.016	0.066	0.109	0.658	0.289	0.327	0.340	0.888	0.822	0.225	0.194	0.318	0.228	0.345
		N	64	60	60	60	60	60	60	60	60	60	60	60	60	60
	C_{10}	r	0.114	0.041	-0.053	0.122	-0.002	-0.018	0.213	-0.112	0.202	-0.080	-0.093	0.006	0.037	0.004
		ρ	0.369	0.756	0.685	0.355	0.986	0.892	0.102	0.394	0.122	0.545	0.478	0.964	0.776	0.976
		N	64	60	60	60	60	60	60	60	60	60	60	60	60	60
	C_{11}	r	-0.022	0.104	-0.172	-0.053	-0.181	0.104	0.024	-0.186	.317	-0.130	-0.040	-0.098	-0.083	0.048
		ρ	0.860	0.428	0.188	0.687	0.166	0.430	0.856	0.154	0.014	0.321	0.764	0.457	0.527	0.716
		N	64	60	60	60	60	60	60	60	60	60	60	60	60	60
	C_{12}	r	0.181	0.021	0.025	-0.060	-0.065	-0.032	0.034	0.132	0.198	0.152	0.060	-0.004	0.174	-0.098
		ρ	0.153	0.875	0.849	0.650	0.622	0.811	0.795	0.315	0.130	0.248	0.649	0.977	0.183	0.456
		N	64	60	60	60	60	60	60	60	60	60	60	60	60	60
	C_{13}	r	0.115	0.062	0.054	0.161	0.129	-0.124	0.198	0.081	-0.029	-0.081	0.010	0.175	0.134	.260
		ρ	0.364	0.636	0.683	0.218	0.324	0.346	0.128	0.537	0.829	0.541	0.940	0.181	0.307	0.045
		N	64	60	60	60	60	60	60	60	60	60	60	60	60	60

			Q	The Third Online Lesson												
				C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}
Q		r	1	0.100	0.142	-0.118	0.010	-0.028	-0.168	0.195	0.053	0.143	0.014	-0.030	.250	.273
		ρ		0.438	0.269	0.357	0.939	0.829	0.188	0.125	0.678	0.262	0.913	0.818	0.048	0.030
		N	67	63	63	63	63	63	63	63	63	63	63	63	63	63
The First Online Lesson	C_1	r	0.099	0.135	0.240	-0.151	-0.006	0.012	-0.130	0.158	0.022	0.168	0.219	0.045	-.321	0.108
		ρ	0.436	0.299	0.062	0.245	0.963	0.926	0.317	0.224	0.864	0.197	0.090	0.729	0.012	0.407
		N	64	61	61	61	61	61	61	61	61	61	61	61	61	61
	C_2	r	0.096	0.038	0.157	-0.113	-0.056	-0.146	-0.210	0.151	0.090	-0.043	0.106	0.004	0.120	-0.023
		ρ	0.450	0.772	0.227	0.385	0.670	0.260	0.104	0.246	0.492	0.741	0.415	0.973	0.356	0.862
		N	64	61	61	61	61	61	61	61	61	61	61	61	61	61
	C_3	r	0.004	-0.051	0.045	0.127	-0.102	-0.214	-0.223	0.110	0.070	-0.066	0.055	-0.081	0.194	-0.029
		ρ	0.974	0.694	0.729	0.329	0.435	0.098	0.083	0.397	0.594	0.611	0.671	0.535	0.135	0.824
		N	64	61	61	61	61	61	61	61	61	61	61	61	61	61
	C_4	r	-0.236	-0.111	0.082	.275	-0.137	-0.085	-0.067	0.054	-0.050	0.180	0.140	-0.090	0.076	-0.140
		ρ	0.061	0.393	0.529	0.032	0.294	0.514	0.609	0.680	0.701	0.166	0.281	0.491	0.559	0.282
		N	64	61	61	61	61	61	61	61	61	61	61	61	61	61
	C_5	r	-.358	0.052	0.060	-0.074	-0.016	-0.036	0.046	-0.043	0.105	0.121	-0.113	-0.068	0.227	-0.148
		ρ	0.004	0.689	0.643	0.572	0.903	0.784	0.726	0.740	0.422	0.352	0.386	0.605	0.078	0.255
		N	64	61	61	61	61	61	61	61	61	61	61	61	61	61
	C_6	r	-0.149	0.063	0.063	-0.108	-0.045	-0.037	-0.096	-0.148	.274	0.093	-0.008	-0.166	-0.100	-0.035
		ρ	0.240	0.628	0.630	0.409	0.729	0.779	0.460	0.255	0.033	0.478	0.953	0.202	0.444	0.786
		N	64	61	61	61	61	61	61	61	61	61	61	61	61	61
	C_7	r	0.182	0.114	0.249	-0.133	-0.227	-0.140	-0.016	0.080	-0.010	0.173	0.131	0.121	-0.082	0.242
		ρ	0.151	0.380	0.053	0.308	0.079	0.282	0.900	0.539	0.938	0.182	0.316	0.351	0.532	0.060
		N	64	61	61	61	61	61	61	61	61	61	61	61	61	61
	C_8	r	0.088	-0.053	0.014	-0.208	0.048	-0.126	-0.054	-0.022	0.113	-0.192	0.022	-0.055	0.101	0.102
		ρ	0.489	0.686	0.915	0.108	0.711	0.335	0.679	0.866	0.386	0.139	0.866	0.671	0.438	0.436
		N	64	61	61	61	61	61	61	61	61	61	61	61	61	61
	C_9	r	.300	-.260	-0.085	0.028	0.028	0.070	0.009	0.171	0.004	0.076	0.110	0.019	0.058	-0.065
		ρ	0.016	0.043	0.514	0.829	0.833	0.594	0.944	0.189	0.978	0.561	0.399	0.887	0.656	0.616
		N	64	61	61	61	61	61	61	61	61	61	61	61	61	61
	C_{10}	r	0.114	-0.211	0.099	0.057	-.413	-0.193	-.304	0.085	-0.013	0.024	0.144	0.019	-0.056	0.007
		ρ	0.369	0.103	0.446	0.665	0.001	0.137	0.017	0.515	0.922	0.855	0.270	0.885	0.670	0.958
		N	64	61	61	61	61	61	61	61	61	61	61	61	61	61
	C_{11}	r	-0.022	-0.111	-0.014	-0.129	-0.014	-0.239	-0.074	0.137	0.027	-0.058	-0.064	0.099	0.129	0.029
		ρ	0.860	0.395	0.914	0.324	0.914	0.064	0.571	0.293	0.839	0.658	0.627	0.446	0.323	0.822
		N	64	61	61	61	61	61	61	61	61	61	61	61	61	61
	C_{12}	r	0.181	-0.010	0.168	-0.108	-0.037	-0.023	-0.240	0.197	-0.184	0.030	0.145	0.034	0.069	-0.164
		ρ	0.153	0.941	0.196	0.409	0.776	0.859	0.063	0.127	0.155	0.818	0.266	0.796	0.595	0.208
		N	64	61	61	61	61	61	61	61	61	61	61	61	61	61
	C_{13}	r	0.115	-0.188	-0.156	0.158	0.011	0.044	-0.115	0.080	-0.116	-0.196	0.209	0.075	-0.022	-0.099
		ρ	0.364	0.147	0.229	0.224	0.931	0.735	0.376	0.538	0.372	0.129	0.106	0.567	0.865	0.447
		N	64	61	61	61	61	61	61	61	61	61	61	61	61	61

		Q	The First Online Lesson												
			C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}
The Second Online Lesson															
C_1	r	0.072	0.250	0.155	-0.205	-0.121	-.254	-0.103	0.113	-0.012	0.239	0.041	0.104	0.021	0.062
	ρ	0.576	0.054	0.238	0.116	0.358	0.050	0.433	0.392	0.927	0.066	0.756	0.428	0.875	0.636
	N	63	60	60	60	60	60	60	60	60	60	60	60	60	60
C_2	r	-0.246	.269	-0.003	-0.182	-0.076	-0.050	-0.207	-0.049	0.114	-0.209	-0.053	-0.172	0.025	0.054
	ρ	0.052	0.038	0.982	0.164	0.562	0.706	0.112	0.708	0.387	0.109	0.685	0.188	0.849	0.683
	N	63	60	60	60	60	60	60	60	60	60	60	60	60	60
C_3	r	0.006	-0.194	0.171	.257	0.158	0.178	.279	-0.041	-.359	-0.058	0.122	-0.053	-0.060	0.161
	ρ	0.962	0.138	0.191	0.048	0.228	0.173	0.031	0.754	0.005	0.658	0.355	0.687	0.650	0.218
	N	63	60	60	60	60	60	60	60	60	60	60	60	60	60
C_4	r	0.093	-0.084	-0.078	0.047	-0.041	-0.024	0.240	-0.158	-0.104	-0.139	-0.002	-0.181	-0.065	0.129
	ρ	0.471	0.523	0.551	0.721	0.755	0.856	0.065	0.229	0.430	0.289	0.986	0.166	0.622	0.324
	N	63	60	60	60	60	60	60	60	60	60	60	60	60	60
C_5	r	-0.072	0.038	0.097	-0.038	0.045	0.186	.280	0.007	-0.119	-0.129	-0.018	0.104	-0.032	-0.124
	ρ	0.575	0.775	0.460	0.775	0.732	0.154	0.030	0.955	0.364	0.327	0.892	0.430	0.811	0.346
	N	63	60	60	60	60	60	60	60	60	60	60	60	60	60
C_6	r	-0.006	-0.195	0.049	0.129	0.095	0.163	0.217	-0.131	-0.176	-0.125	0.213	0.024	0.034	0.198
	ρ	0.965	0.136	0.712	0.328	0.470	0.212	0.096	0.318	0.179	0.340	0.102	0.856	0.795	0.128
	N	63	60	60	60	60	60	60	60	60	60	60	60	60	60
C_7	r	0.084	0.056	-0.077	-.331	-0.044	-0.152	-0.129	-0.198	0.051	-0.019	-0.112	-0.186	0.132	0.081
	ρ	0.511	0.668	0.557	0.010	0.741	0.248	0.327	0.129	0.698	0.888	0.394	0.154	0.315	0.537
	N	63	60	60	60	60	60	60	60	60	60	60	60	60	60
C_8	r	-0.133	-0.126	0.112	-0.002	0.139	0.161	0.024	0.174	-0.080	-0.030	0.202	.317	0.198	-0.029
	ρ	0.297	0.336	0.394	0.985	0.291	0.219	0.857	0.184	0.542	0.822	0.122	0.014	0.130	0.829
	N	63	60	60	60	60	60	60	60	60	60	60	60	60	60
C_9	r	-0.131	0.079	-0.097	-0.014	-0.020	0.030	-0.197	-0.024	0.199	-0.159	-0.080	-0.130	0.152	-0.081
	ρ	0.306	0.548	0.460	0.917	0.880	0.822	0.131	0.857	0.128	0.225	0.545	0.321	0.248	0.541
	N	63	60	60	60	60	60	60	60	60	60	60	60	60	60
C_{10}	r	0.133	-0.107	0.024	-0.103	0.024	0.054	-0.123	-0.078	-.277	-0.170	-0.093	-0.040	0.060	0.010
	ρ	0.298	0.416	0.855	0.432	0.854	0.682	0.350	0.553	0.032	0.194	0.478	0.764	0.649	0.940
	N	63	60	60	60	60	60	60	60	60	60	60	60	60	60
C_{11}	r	0.061	-0.043	-0.092	-.264	-.262	-0.103	-.259	0.089	-0.097	-0.131	0.006	-0.098	-0.004	0.175
	ρ	0.634	0.747	0.485	0.041	0.043	0.435	0.046	0.499	0.460	0.318	0.964	0.457	0.977	0.181
	N	63	60	60	60	60	60	60	60	60	60	60	60	60	60
C_{12}	r	0.010	0.044	0.006	-0.226	-0.138	0.137	-0.125	0.078	-0.038	-0.158	0.037	-0.083	0.174	0.134
	ρ	0.935	0.739	0.965	0.083	0.292	0.298	0.341	0.552	0.771	0.228	0.776	0.527	0.183	0.307
	N	63	60	60	60	60	60	60	60	60	60	60	60	60	60
C_{13}	r	-0.017	0.043	0.191	-0.010	-0.137	0.103	-0.017	-0.056	-0.187	-0.124	0.004	0.048	-0.098	.260
	ρ	0.896	0.746	0.144	0.942	0.295	0.432	0.898	0.669	0.152	0.345	0.976	0.716	0.456	0.045
	N	63	60	60	60	60	60	60	60	60	60	60	60	60	60

		Q	The Second Online Lesson												
			C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}
The Second Online Lesson															
C_1	r	0.072	1	.466	-.347	-.281	-0.198	-.475	0.240	0.150	.386	0.099	0.138	-0.044	0.196
	ρ	0.576		0.000	0.005	0.026	0.120	0.000	0.058	0.242	0.002	0.441	0.280	0.731	0.124
	N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
C_2	r	-0.246	.466	1	-.564	-0.222	-0.145	-.478	0.231	0.089	.648	0.016	0.236	0.210	.266
	ρ	0.052	0.000		0.000	0.080	0.257	0.000	0.069	0.488	0.000	0.902	0.062	0.099	0.035
	N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
C_3	r	0.006	-.347	-.564	1	.439	.392	.731	-.259	-0.106	-.480	0.059	-0.234	-0.087	0.144
	ρ	0.962	0.005	0.000		0.000	0.001	0.000	0.040	0.408	0.000	0.647	0.065	0.499	0.261
	N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
C_4	r	0.093	-.281	-0.222	.439	1	.369	.663	-0.159	-.271	-0.214	0.076	-0.072	-0.071	0.119
	ρ	0.471	0.026	0.080	0.000		0.003	0.000	0.214	0.032	0.093	0.556	0.573	0.582	0.355
	N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
C_5	r	-0.072	-0.198	-0.145	.392	.369	1	.446	0.015	-0.204	-.297	-0.024	-.289	-0.038	0.243
	ρ	0.575	0.120	0.257	0.001	0.003		0.000	0.910	0.109	0.018	0.850	0.022	0.766	0.055
	N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
C_6	r	-0.006	-.475	-.478	.731	.663	.446	1	-0.141	-0.191	-.373	0.031	-0.127	-0.153	0.047
	ρ	0.965	0.000	0.000	0.000	0.000	0.000		0.269	0.134	0.003	0.811	0.322	0.232	0.712
	N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
C_7	r	0.084	0.240	0.231	-.259	-0.159	0.015	-0.141	1	0.044	0.198	-0.101	-0.013	0.076	-0.016
	ρ	0.511	0.058	0.069	0.040	0.214	0.910	0.269		0.733	0.119	0.431	0.919	0.555	0.901
	N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
C_8	r	-0.133	0.150	0.089	-0.106	-.271	-0.204	-0.191	0.044	1	0.234	0.125	0.228	0.243	0.122
	ρ	0.297	0.242	0.488	0.408	0.032	0.109	0.134	0.733		0.065	0.327	0.073	0.055	0.340
	N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
C_9	r	-0.131	.386	.648	-.480	-0.214	-.297	-.373	0.198	0.234	1	0.053	0.153	0.022	0.009
	ρ	0.306	0.002	0.000	0.000	0.093	0.018	0.003	0.119	0.065		0.682	0.233	0.867	0.941
	N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
C_{10}	r	0.133	0.099	0.016	0.059	0.076	-0.024	0.031	-0.101	0.125	0.053	1	0.055	-0.189	0.247
	ρ	0.298	0.441	0.902	0.647	0.556	0.850	0.811	0.431	0.327	0.682		0.668	0.137	0.051
	N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
C_{11}	r	0.061	0.138	0.236	-0.234	-0.072	-.289	-0.127	-0.013	0.228	0.153	0.055	1	.371	0.246
	ρ	0.634	0.280	0.062	0.065	0.573	0.022	0.322	0.919	0.073	0.233	0.668		0.003	0.052
	N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
C_{12}	r	0.010	-0.044	0.210	-0.087	-0.071	-0.038	-0.153	0.076	0.243	0.022	-0.189	.371	1	0.190
	ρ	0.935	0.731	0.099	0.499	0.582	0.766	0.232	0.555	0.055	0.867	0.137	0.003		0.135
	N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
C_{13}	r	-0.017	0.196	.266	0.144	0.119	0.243	0.047	-0.016	0.122	0.009	0.247	0.246	0.190	1
	ρ	0.896	0.124	0.035	0.261	0.355	0.055	0.712	0.901	0.340	0.941	0.051	0.052	0.135	
	N	63	63	63	63	63	63	63	63	63	63	63	63	63	63

The Second Online Lesson		Q	The Third Online Lesson												
			C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}
C_1	r	0.072	0.151	0.071	-0.154	-0.074	0.033	-0.082	0.027	0.137	0.215	0.221	.259	-0.127	-0.031
	ρ	0.576	0.244	0.586	0.236	0.569	0.800	0.530	0.835	0.294	0.096	0.087	0.044	0.330	0.814
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_2	r	-0.246	0.241	0.164	-0.120	-0.037	0.117	-0.083	-0.112	0.045	-0.126	0.161	0.090	-.316	-0.105
	ρ	0.052	0.061	0.206	0.357	0.776	0.370	0.527	0.389	0.729	0.335	0.214	0.489	0.013	0.421
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_3	r	0.006	-0.247	-0.190	0.166	-0.093	-0.073	-0.020	0.079	-0.105	0.141	-0.208	-0.217	0.145	-0.045
	ρ	0.962	0.055	0.143	0.201	0.476	0.578	0.876	0.543	0.420	0.280	0.108	0.094	0.264	0.729
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_4	r	0.093	-0.170	-0.155	-0.069	0.007	0.099	-0.098	-0.164	-0.091	0.060	-0.209	-0.021	-0.070	0.025
	ρ	0.471	0.189	0.233	0.598	0.960	0.446	0.453	0.206	0.484	0.645	0.105	0.872	0.595	0.850
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_5	r	-0.072	0.084	0.137	-0.079	0.048	-0.119	-0.249	-0.088	0.049	0.239	-0.214	-0.006	0.170	-0.135
	ρ	0.575	0.521	0.294	0.547	0.713	0.360	0.053	0.500	0.709	0.064	0.097	0.962	0.190	0.299
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_6	r	-0.006	-.409	-0.245	0.206	-0.042	-0.089	-0.155	-0.054	-0.116	0.047	-0.151	-0.239	0.004	-0.043
	ρ	0.965	0.001	0.057	0.112	0.748	0.497	0.234	0.680	0.375	0.721	0.246	0.063	0.979	0.745
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_7	r	0.084	0.032	-0.060	0.156	-0.052	0.163	0.003	0.046	-0.013	-0.044	0.197	0.066	-0.238	-0.056
	ρ	0.511	0.804	0.647	0.231	0.693	0.210	0.981	0.724	0.918	0.734	0.128	0.613	0.065	0.668
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_8	r	-0.133	0.029	-0.062	0.105	-.371	-0.031	-0.039	0.077	0.111	-0.085	0.104	0.107	0.100	-0.206
	ρ	0.297	0.826	0.637	0.419	0.003	0.810	0.766	0.555	0.394	0.514	0.426	0.414	0.441	0.111
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_9	r	-0.131	0.108	-0.017	-0.128	-0.090	0.062	-0.233	0.049	0.148	-0.122	0.221	0.132	-0.206	-0.185
	ρ	0.306	0.409	0.895	0.325	0.491	0.634	0.070	0.710	0.255	0.350	0.088	0.312	0.110	0.153
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_{10}	r	0.133	0.158	0.091	0.075	-0.007	-0.046	-0.090	0.252	0.123	-0.114	-0.057	-0.022	0.052	0.048
	ρ	0.298	0.224	0.487	0.566	0.956	0.726	0.489	0.050	0.344	0.380	0.662	0.866	0.692	0.715
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_{11}	r	0.061	-0.010	0.012	-0.095	-0.146	0.055	0.111	-0.047	0.162	-0.070	-0.004	0.050	-0.093	-0.022
	ρ	0.634	0.938	0.926	0.465	0.263	0.676	0.395	0.721	0.212	0.594	0.975	0.703	0.475	0.869
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_{12}	r	0.010	0.034	0.080	-0.108	-0.243	-0.056	-0.096	-0.018	0.070	0.087	0.162	0.197	0.020	0.062
	ρ	0.935	0.794	0.539	0.409	0.060	0.671	0.460	0.891	0.592	0.505	0.212	0.128	0.880	0.637
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_{13}	r	-0.017	.325	0.140	-0.087	-0.056	-0.011	-0.119	0.171	0.131	0.101	0.109	0.185	-0.076	-0.036
	ρ	0.896	0.011	0.280	0.506	0.668	0.931	0.360	0.187	0.313	0.438	0.405	0.154	0.560	0.785
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61

The Third Online Lesson		Q	The First Online Lesson												
			C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}
C_1	r	0.100	0.135	0.038	-0.051	-0.111	0.052	0.063	0.114	-0.053	-.260	-0.211	-0.111	-0.010	-0.188
	ρ	0.438	0.299	0.772	0.694	0.393	0.689	0.628	0.380	0.686	0.043	0.103	0.395	0.941	0.147
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_2	r	0.142	0.240	0.157	0.045	0.082	0.060	0.063	0.249	0.014	-0.085	0.099	-0.014	0.168	-0.156
	ρ	0.269	0.062	0.227	0.729	0.529	0.643	0.630	0.053	0.915	0.514	0.446	0.914	0.196	0.229
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_3	r	-0.118	-0.151	-0.113	0.127	.275	-0.074	-0.108	-0.133	-0.208	0.028	0.057	-0.129	-0.108	0.158
	ρ	0.357	0.245	0.385	0.329	0.032	0.572	0.409	0.308	0.108	0.829	0.665	0.324	0.409	0.224
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_4	r	0.010	-0.006	-0.056	-0.102	-0.137	-0.016	-0.045	-0.227	0.048	0.028	-.413	-0.014	-0.037	0.011
	ρ	0.939	0.963	0.670	0.435	0.294	0.903	0.729	0.079	0.711	0.833	0.001	0.914	0.776	0.931
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_5	r	-0.028	0.012	-0.146	-0.214	-0.085	-0.036	-0.037	-0.140	-0.126	0.070	-0.193	-0.239	-0.023	0.044
	ρ	0.829	0.926	0.260	0.098	0.514	0.784	0.779	0.282	0.335	0.594	0.137	0.064	0.859	0.735
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_6	r	-0.168	-0.130	-0.210	-0.223	-0.067	0.046	-0.096	-0.016	-0.054	0.009	-.304	-0.074	-0.240	-0.115
	ρ	0.188	0.317	0.104	0.083	0.609	0.726	0.460	0.900	0.679	0.944	0.017	0.571	0.063	0.376
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_7	r	0.195	0.158	0.151	0.110	0.054	-0.043	-0.148	0.080	-0.022	0.171	0.085	0.137	0.197	0.080
	ρ	0.125	0.224	0.246	0.397	0.680	0.740	0.255	0.539	0.866	0.189	0.515	0.293	0.127	0.538
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_8	r	0.053	0.022	0.090	0.070	-0.050	0.105	.274	-0.010	0.113	0.004	-0.013	0.027	-0.184	-0.116
	ρ	0.678	0.864	0.492	0.594	0.701	0.422	0.033	0.938	0.386	0.978	0.922	0.839	0.155	0.372
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_9	r	0.143	0.168	-0.043	-0.066	0.180	0.121	0.093	0.173	-0.192	0.076	0.024	-0.058	0.030	-0.196
	ρ	0.262	0.197	0.741	0.611	0.166	0.352	0.478	0.182	0.139	0.561	0.855	0.658	0.818	0.129
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_{10}	r	0.014	0.219	0.106	0.055	0.140	-0.113	-0.008	0.131	0.022	0.110	0.144	-0.064	0.145	0.209
	ρ	0.913	0.090	0.415	0.671	0.281	0.386	0.953	0.316	0.866	0.399	0.270	0.627	0.266	0.106
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_{11}	r	-0.030	0.045	0.004	-0.081	-0.090	-0.068	-0.166	0.121	-0.055	0.019	0.019	0.099	0.034	0.075
	ρ	0.818	0.729	0.973	0.535	0.491	0.605	0.202	0.351	0.671	0.887	0.885	0.446	0.796	0.567
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_{12}	r	.250	-.321	0.120	0.194	0.076	0.227	-0.100	-0.082	0.101	0.058	-0.056	0.129	0.069	-0.022
	ρ	0.048	0.012	0.356	0.135	0.559	0.078	0.444	0.532	0.438	0.656	0.670	0.323	0.595	0.865
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_{13}	r	.273	0.108	-0.023	-0.029	-0.140	-0.148	-0.035	0.242	0.102	-0.065	0.007	0.029	-0.164	-0.099
	ρ	0.030	0.407	0.862	0.824	0.282	0.255	0.786	0.060	0.436	0.616	0.958	0.822	0.208	0.447
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61

The Third Online Lesson		Q	The Second Online Lesson												
			C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}
C_1	r	0.100	0.151	0.241	-0.247	-0.170	0.084	-.409	0.032	0.029	0.108	0.158	-0.010	0.034	.325
	ρ	0.438	0.244	0.061	0.055	0.189	0.521	0.001	0.804	0.826	0.409	0.224	0.938	0.794	0.011
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_2	r	0.142	0.071	0.164	-0.190	-0.155	0.137	-0.245	-0.060	-0.062	-0.017	0.091	0.012	0.080	0.140
	ρ	0.269	0.586	0.206	0.143	0.233	0.294	0.057	0.647	0.637	0.895	0.487	0.926	0.539	0.280
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_3	r	-0.118	-0.154	-0.120	0.166	-0.069	-0.079	0.206	0.156	0.105	-0.128	0.075	-0.095	-0.108	-0.087
	ρ	0.357	0.236	0.357	0.201	0.598	0.547	0.112	0.231	0.419	0.325	0.566	0.465	0.409	0.506
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_4	r	0.010	-0.074	-0.037	-0.093	0.007	0.048	-0.042	-0.052	-.371	-0.090	-0.007	-0.146	-0.243	-0.056
	ρ	0.939	0.569	0.776	0.476	0.960	0.713	0.748	0.693	0.003	0.491	0.956	0.263	0.060	0.668
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_5	r	-0.028	0.033	0.117	-0.073	0.099	-0.119	-0.089	0.163	-0.031	0.062	-0.046	0.055	-0.056	-0.011
	ρ	0.829	0.800	0.370	0.578	0.446	0.360	0.497	0.210	0.810	0.634	0.726	0.676	0.671	0.931
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_6	r	-0.168	-0.082	-0.083	-0.020	-0.098	-0.249	-0.155	0.003	-0.039	-0.233	-0.090	0.111	-0.096	-0.119
	ρ	0.188	0.530	0.527	0.876	0.453	0.053	0.234	0.981	0.766	0.070	0.489	0.395	0.460	0.360
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_7	r	0.195	0.027	-0.112	0.079	-0.164	-0.088	-0.054	0.046	0.077	0.049	0.252	-0.047	-0.018	0.171
	ρ	0.125	0.835	0.389	0.543	0.206	0.500	0.680	0.724	0.555	0.710	0.050	0.721	0.891	0.187
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_8	r	0.053	0.137	0.045	-0.105	-0.091	0.049	-0.116	-0.013	0.111	0.148	0.123	0.162	0.070	0.131
	ρ	0.678	0.294	0.729	0.420	0.484	0.709	0.375	0.918	0.394	0.255	0.344	0.212	0.592	0.313
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_9	r	0.143	0.215	-0.126	0.141	0.060	0.239	0.047	-0.044	-0.085	-0.122	-0.114	-0.070	0.087	0.101
	ρ	0.262	0.096	0.335	0.280	0.645	0.064	0.721	0.734	0.514	0.350	0.380	0.594	0.505	0.438
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_{10}	r	0.014	0.221	0.161	-0.208	-0.209	-0.214	-0.151	0.197	0.104	0.221	-0.057	-0.004	0.162	0.109
	ρ	0.913	0.087	0.214	0.108	0.105	0.097	0.246	0.128	0.426	0.088	0.662	0.975	0.212	0.405
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_{11}	r	-0.030	.259	0.090	-0.217	-0.021	-0.006	-0.239	0.066	0.107	0.132	-0.022	0.050	0.197	0.185
	ρ	0.818	0.044	0.489	0.094	0.872	0.962	0.063	0.613	0.414	0.312	0.866	0.703	0.128	0.154
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_{12}	r	.250	-0.127	-.316	0.145	-0.070	0.170	0.004	-0.238	0.100	-0.206	0.052	-0.093	0.020	-0.076
	ρ	0.048	0.330	0.013	0.264	0.595	0.190	0.979	0.065	0.441	0.110	0.692	0.475	0.880	0.560
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61
C_{13}	r	.273	-0.031	-0.105	-0.045	0.025	-0.135	-0.043	-0.056	-0.206	-0.185	0.048	-0.022	0.062	-0.036
	ρ	0.030	0.814	0.421	0.729	0.850	0.299	0.745	0.668	0.111	0.153	0.715	0.869	0.637	0.785
	N	63	61	61	61	61	61	61	61	61	61	61	61	61	61

			Q	The Third Online Lesson												
				C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}
The Third Online Lesson	C_1	r	0.100	1	.580	-0.099	0.043	-0.081	-0.115	0.065	.269	.274	0.071	.347	-0.052	.261
		ρ	0.438		0.000	0.442	0.736	0.530	0.372	0.612	0.033	0.030	0.581	0.005	0.686	0.039
		N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	C_2	r	0.142	.580	1	-0.084	-0.078	-0.140	-.265	.305	0.170	.260	0.149	0.126	0.061	0.234
		ρ	0.269	0.000		0.515	0.541	0.273	0.036	0.015	0.182	0.040	0.243	0.326	0.635	0.065
		N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	C_3	r	-0.118	-0.099	-0.084	1	-0.036	-0.057	-0.051	0.163	-0.151	-0.102	0.069	-0.117	-0.101	-0.086
		ρ	0.357	0.442	0.515		0.777	0.658	0.691	0.203	0.237	0.425	0.590	0.360	0.433	0.504
		N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	C_4	r	0.010	0.043	-0.078	-0.036	1	0.096	.264	-0.223	0.074	-0.093	-0.026	-0.009	0.077	0.084
		ρ	0.939	0.736	0.541	0.777		0.454	0.037	0.080	0.565	0.467	0.840	0.944	0.548	0.511
		N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	C_5	r	-0.028	-0.081	-0.140	-0.057	0.096	1	.487	-0.110	-0.095	-.264	0.052	-0.099	-0.212	-0.205
		ρ	0.829	0.530	0.273	0.658	0.454		0.000	0.391	0.459	0.036	0.687	0.440	0.095	0.107
		N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	C_6	r	-0.168	-0.115	-.265	-0.051	.264	.487	1	-0.233	-0.170	-.298	-.288	0.008	-0.218	0.090
		ρ	0.188	0.372	0.036	0.691	0.037	0.000		0.067	0.183	0.018	0.022	0.949	0.086	0.484
		N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	C_7	r	0.195	0.065	.305	0.163	-0.223	-0.110	-0.233	1	-0.018	-0.034	0.144	0.002	0.059	-0.004
		ρ	0.125	0.612	0.015	0.203	0.080	0.391	0.067		0.889	0.794	0.262	0.986	0.647	0.978
		N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	C_8	r	0.053	.269	0.170	-0.151	0.074	-0.095	-0.170	-0.018	1	0.084	-0.018	0.077	0.119	0.175
		ρ	0.678	0.033	0.182	0.237	0.565	0.459	0.183	0.889		0.511	0.891	0.547	0.352	0.171
		N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	C_9	r	0.143	.274	.260	-0.102	-0.093	-.264	-.298	-0.034	0.084	1	0.145	.288	0.108	0.129
		ρ	0.262	0.030	0.040	0.425	0.467	0.036	0.018	0.794	0.511		0.258	0.022	0.399	0.312
		N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	C_{10}	r	0.014	0.071	0.149	0.069	-0.026	0.052	-.288	0.144	-0.018	0.145	1	0.184	-0.195	-0.078
		ρ	0.913	0.581	0.243	0.590	0.840	0.687	0.022	0.262	0.891	0.258		0.148	0.126	0.544
		N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	C_{11}	r	-0.030	.347	0.126	-0.117	-0.009	-0.099	0.008	0.002	0.077	.288	0.184	1	-0.021	0.106
		ρ	0.818	0.005	0.326	0.360	0.944	0.440	0.949	0.986	0.547	0.022	0.148		0.867	0.409
		N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	C_{12}	r	.250	-0.052	0.061	-0.101	0.077	-0.212	-0.218	0.059	0.119	0.108	-0.195	-0.021	1	-0.130
		ρ	0.048	0.686	0.635	0.433	0.548	0.095	0.086	0.647	0.352	0.399	0.126	0.867		0.308
		N	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	C_{13}	r	.273	.261	0.234	-0.086	0.084	-0.205	0.090	-0.004	0.175	0.129	-0.078	0.106	-0.130	1
		ρ	0.030	0.039	0.065	0.504	0.511	0.107	0.484	0.978	0.171	0.312	0.544	0.409	0.308	
		N	63	63	63	63	63	63	63	63	63	63	63	63	63	63

r The Pearson correlation value

ρ The ρ value (2-tailed)

N The size of the sample

Q The Study Preference Questionnaire

C_1, C_2, …. and C_{13} (see Table 11)

☐ Correlation is significant at the 0.01 level (2-tailed)

☐ Correlation is significant at the 0.05 level (2-tailed)