

## REVIEW LESSON

MTA Course: Software Development Fundamentals

Lesson name: Software Development Fundamentals 1.2

Topic: Understand computer decision structures (One 50-minute class period)

File name: SoftDevFund\_RL\_1.2

### Lesson Objective:

**1.2:** Understand computer decision structures. *This objective may include but is not limited to:* various decision structures used in all computer programming languages; If decision structures; multiple decision structures such as `if...else` and `switch/Select Case`; reading flowcharts; decision tables; evaluating expressions.

### Preparation Details

#### Prerequisite student experiences and knowledge

This MTA Certification Exam Review lesson is written for students who have learned about programming. Students who do not have the prerequisite knowledge and experiences cited in the objective will find additional learning opportunities using resources such as those listed in the Microsoft® resources and Web links at the end of this review lesson.

#### Instructor preparation activities

Prepare vocabulary cards for “What’s on my back?” game.

#### Resources, software, and additional files needed for this lesson:

- SoftDevFund\_PPT\_1.2
- SoftDevFund\_SA\_1.2\_1
- SoftDevFund\_SA\_1.2\_1\_key
- SoftDevFund\_SA\_1.2\_2

## **Teaching Guide**

### **Essential Vocabulary:**

**algorithm**—a finite sequence of steps for solving a logical or mathematical problem or performing a task.

**Boolean**—of, pertaining to, or characteristic of logical (true, false) values.

**compound statement**—a single instruction composed of two or more individual instructions.

**conditional statement**—a programming-language statement that selects an execution path based on whether some condition is true or false (for example, the `if` statement).

**expression**—a combination of symbols—identifiers, values, and operators—that yields a result upon evaluation. The resulting value can then be assigned to a variable, passed as an argument, tested in a control statement, or used in another expression.

**flowchart**—a graphic map of the path of control or data through the operations in a program or an information-handling system.

**logical operator**—an operator that manipulates binary values at the bit level. In some programming languages, logical operators are identical to Boolean operators, which manipulate true and false values.

**relational operator**—an operator that allows the programmer to compare two (or more) values or expressions. Typical relational operators are greater than (`>`), equal to (`=`), less than (`<`), not equal to (`!=`), greater than or equal to (`>=`), and less than or equal to (`<=`).

## **Lesson Sequence**

### **Activating prior knowledge/lesson staging (5 minutes)**

1. Show the Activator slide in the PowerPoint® presentation for this lesson.
  - a. Have students take turns completing the conditional statements.

### **Lesson activity (35 minutes)**

1. Play the “What’s on my back?” game (10 minutes)—Use this activity to review the many vocabulary terms related to decision structures. Students will actively engage in the process of making decisions and review the associated terms, by participating in a game in which they must determine the term taped to their back:
  - Tape a strip of paper to the back of each student as he or she enters the room (do not let the student see the word).

- Display the terms, without definitions, on the board, as a projected computer text file, or on some other display medium.
- Tell the students:
  - “On your back is a vocabulary term related to computer decision structures. Your task is to show your back to another student and ask a “yes” or “no” question to figure out the correct term taped on your back. Ask any student up to three questions that can be answered with “Yes” or “No.” No other questions can be asked. You should not merely ask if the word on your back is one of the terms displayed; you must narrow the possibilities by asking questions about the word. Example: Is it a keyword?”
  - “If you do not figure out the word on your back in the three allowed questions, move on to another student and repeat the process with new questions. When you correctly determine the word, remove the word from your back and add it to the list displayed.”
- 2. Demonstrate the activity by taping a term to your back and showing it to the students. Ask questions as if you were trying to figure out what the word was. Remind the students that all questions must have “yes” or “no” answers to narrow the possibilities. Count the number of questions you ask until you get to the correct answer.
- 3. Display the terms used in the “What’s on my back?” game and ask students if they have questions.
- 4. Display the PowerPoint and use it to review
  - relational and logical operators
  - decision structures
  - the execution of the structures using flowcharts (25 minutes)
- 5. Review common syntax errors in C-style languages when writing conditionals such as:

```
if(shoeCost < 80.0); //no semi-colon at end of condition
bob.buy(shoes);

if(shoeCost = 80.0) //need two equal signs
bob.buy(shoes);

if(shoeCost <= 80.0)
bob.buy(leftShoe); //need braces for block of code
bob.buy(rightShoe);
```

### **Assessment/lesson reflection (10 minutes)**

1. Student Activity (SoftDevFund\_SA\_1.2\_2)

2. This worksheet assesses student understanding at multiple cognitive levels:
  - They analyze and evaluate code for deficiencies.
  - They create code based on a situation.
  - They apply their understanding of conditional structures.

### **Microsoft resources and Web links**

*<http://msdn.microsoft.com/en-us/beginner/default.aspx>*

### **Suggested best practices:**

- Limit the amount of time spent on the “What’s on my back?” game to 10–15 minutes to focus student attention.
- If students are having trouble figuring out the terms and the “What’s on my back?” game seems to be taking too long, allow students to give each other hints instead of just answering “Yes” or “No.”
- You will want to have extra vocabulary cards available for advanced students who already know the basic terms.

### **Additional notes to the instructor:**

- Additional terms can be added to the essential vocabulary list to adjust to the size of the class.
- Student Activity Worksheet 1.2\_2 allows students to use conditional logic to solve a puzzle. This is to be used as an extension activity.