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CSC 151 02

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Review Questions and Exercises

Multiple Choice and True/False

1. The if statement is an example of a          .
2. sequence structure.
3. decision structure.
4. pathway structure.
5. class structure.
6. This type of expression has a value of either true or false.
7. binary expression
8. decision expression
9. unconditional expression
10. boolean expression
11. >, <, and == are          .
12. relational operators.
13. logical operators.
14. conditional operators.
15. ternary operators.
16. &&, ||, and ! are          .
17. relational operators.
18. logical operators.
19. conditional operators.
20. ternary operators.
21. This is an empty statement that does nothing.
22. missing statement
23. virtual statement
24. null statement
25. conditional statement
26. To create a block of statements, you enclose the statements in.
27. parentheses ()
28. square brackets []
29. angled brackets <>
30. braces {}
31. This is a boolean variable that signals when some condition exists in the program.
32. flag
33. signal
34. sentinel
35. siren
36. How does the character “A” compare to the character “B”?
37. “A” is greater than “B”
38. “A” is less than “B”
39. “A” is equal to “B”
40. You cannot compare characters.
41. This is an if statement that appears inside another if statement.
42. nested if statement
43. tiered if statement
44. dislodged if statement
45. structured if statement

10. An else clause always goes with which of the following?

A. the closest previous if clause that doesn’t already have its own else clause.

B. the closest if clause.

C. the if clause that is randomly selected by the compiler.

D. none of these

11. When determining whether a number is inside a range, it’s best to use this operator.

1. &&
2. !
3. ||
4. ? :

12. This determines whether two different String objects contain the same string.

A. the == operator

B. the = operator

C. the equals method

D. the stringCompare method

13. The conditional operator takes how many operands?

A. one

B. two

C. three

D. four

14. This section of a switch statement is branched to if none of the case values match the testExpression.

1. else
2. default
3. case
4. otherwise

15. True or False: The = operator and the == operator perform the same operation.

T/F

16. True or False: A conditionally executed statement should be indented one level from the if clause.

T/F

17. True or False: All lines in a conditionally executed block should be indented one level.

T/F

18. True or False: When an if statement is nested in the if clause of another statement, the only time the inner if statement is executed is when the boolean expression of the outer if statement is true.

T/F

19. True or False: When an if statement is nested in the else clause of another statement, the only time the inner if statement is executed is when the boolean expression of the outer if statement is true.

T/F

20. True or False: The scope of a variable is limited to the block in which it is defined.

T/F

Find the Error

Find the errors in the following code:

1. // Warning! This code contains ERRORS!

if (x == 1);

y = 2;

else if (x == 2);

y = 3;

else if (x == 3);

y = 4;

No need to add semicolon after each clause

1. // Warning! This code contains an ERROR!

if (average = 100)

System.out.println("Perfect Average!");

== not =

1. // Warning! This code contains ERRORS!

if (num2 == 0)

System.out.println("Division by zero is not possible.");

System.out.println("Please run the program again ");

System.out.println("and enter a number besides zero.");

else

Quotient = num1 / num2;

System.out.print("The quotient of " + Num1);

System.out.print(" divided by " + Num2 + " is ");

System.out.println(Quotient);

Need braces to run

1. // Warning! This code contains ERRORS!

switch (score)

{

case (score > 90):

grade = 'A';

break;

case(score > 80):

grade = 'b';

break;

case(score > 70):

grade = 'C';

break;

case (score > 60):

grade = 'D';

break;

default:

grade = 'F';

}

Can’t use >, <, etc?

1. The following statement should determine whether x is not greater than 20. What is wrong with it?

if (!x > 20)

Need one more “)”

1. The following statement should determine whether count is within the range of 0 through 100. What is wrong with it?

if (count >= 0 || count <= 100)

&&

1. The following statement should determine whether count is outside the range of 0 through 100. What is wrong with it?

if (count < 0 && count > 100)

Use II

1. The following statement should assign 0 to z if a is less than 10; otherwise it should assign 7 to z. What is wrong with it?

z = (a < 10) : 0 ? 7;

switch the ? and :

1. Assume that partNumber references a String object. The following if statement should perform a case-insensitive comparison. What is wrong with the code?

if (partNumber.equals("BQ789W4"))

available = true;

Use equalsIgnoreCase

Algorithm Workbench

1. Write an if statement that assigns 100 to x when y is equal to 0.

if (y == 0)

x = 100;

1. Write an if-else statement that assigns 0 to x when y is equal to 10. Otherwise, it should assign 1 to x.

if (y == 10)

{

x = 0;

}

else

{

x = 1;

}

1. Using the following chart, write an if-else-if statement that assigns .10, .15, or .20 to commission, depending on the value in sales:

|  |  |
| --- | --- |
| Sales | Commission Rate |
| Up to $10,000 | 10% |
| $10,000 to $15,000 | 15% |
| Over $15,000 | 20% |

if ( sales <= 10000)

commission = .10;

else if (sales > 10000 || sales < 15000)

commission = .15;

else

commission = .20;

1. Write an if statement that sets the variable hours to 10 when the flag variable minimum is equal to true.

if ( minimum = true)

hours = 10;

1. Write nested if statements that perform the following tests: If amount1 is greater than 10, and amount2 is less than 100, display the greater of the two.

if (amount1 > 10 && amount2 < 100)

{

if (amount1 > amount2)

{

System.out.println(amount1);

}

else

{

System.out.println(amount2);

}

}

1. Write an if statement that prints the message “The number is valid” if the variable grade is within the range 0 through 100.

if (grade >= 0 && grade <= 100)

System.out.println("The number is valid.");

1. Write an if statement that prints the message “The number is valid” if the variable temperature is within the range -50 through 150.

if (temperature >= -50 && temperature <= 150)

System.out.println("The number is valid.");

1. Write an if statement that prints the message “The number is not valid” if the variable hours is outside the range 0 through 80.

if (hours < 0 || hours > 80)

System.out.println("The number is not valid.");

1. Write an if-else statement that displays the String objects title1 and title2 in alphabetical order.

if (title1.compareTo(title2) < 0)

{

System.out.println(title1);

System.out.println(title2);

}

else

{

System.out.println(title2);

System.out.println(title1);

}

10. Convert the following if-else-if statement into a switch statement:

if (choice == 1)

{

System.out.println("You selected 1.");

}

else if (choice == 2 || choice == 3)

{

System.out.println("You selected 2 or 3.");

}

else if (choice == 4)

{

System.out.println("You selected 4.");

}

else

{

System.out.println("Select again please.");

}

11. Match the conditional expression with the if-else statement that performs the same operation.

1. q = x < y ? a + b : x \* 2;
2. q = x < y ? x \* 2 : a + b;
3. x < y ? q = 0 : q = 1;

\_\_C\_\_ if (x < y)

q = 0;

else

q = 1;

\_\_A\_\_ if (x < y)

q = a + b;

else

q = x \* 2;

\_\_B\_\_ if (x < y)

q = x \* 2;

else

q = a + b;

Programing Challenges

2. Time Calculator

Write a program that asks the user to enter a number of seconds.

There are 60 seconds in a minute. If the number of seconds entered by the user is greater than or equal to 60, the program should display the number of minutes and leftover seconds in that many seconds.

There are 3,600 seconds in an hour. If the number of seconds entered by the user is greater than or equal to 3,600, the program should display the number of hours, minutes, and leftover seconds in that many seconds.

There are 86,400 seconds in a day. If the number of seconds entered by the user is greater than or equal to 86,400, the program should display the number of days, hours, minutes, and leftover seconds in that many seconds.

4. Software Sales

A software company sells a package that retails for $99. Quantity discounts are given according to the following table:

|  |  |
| --- | --- |
| Quantity | Discount |
| 10 – 19 | 20% |
| 20 – 49 | 30% |
| 50 – 99 | 40% |
| 100 – more | 50% |

Design a class that stores the number of units sold, and has a method that returns the total cost of the purchase.

13. Body Mass Index

Write a program that calculates and displays a person’s body mass index (BMI). The BMI is often used to determine whether a person is overweight or underweight for his or her height. A person’s BMI is calculated with the following formula:

BMI = weight × 703/height2

where weight is measured in pounds, and height is measured in inches. The program should display a message indicating whether the person has optimal weight, is underweight, or is overweight. A person’s weight is considered to be optimal if his or her BMI is between 18.5 and 25. If the BMI is less than 18.5, the person is considered to be underweight. If the BMI value is greater than 25, the person is considered to be overweight.

15. Book Club Points

Serendipity Booksellers has a book club that awards points to its customers based on the number of books purchased each month. The points are awarded as follows:

If a customer purchases 0 books, he or she earns 0 points.

If a customer purchases 1 book, he or she earns 5 points.

If a customer purchases 2 books, he or she earns 15 points.

If a customer purchases 3 books, he or she earns 30 points.

If a customer purchases 4 or more books, he or she earns 60 points.

Write a program that asks the user to enter the number of books that he or she has purchased this month, then displays the number of points awarded.