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Programming Fundamentals – Video Lesson

Decision Structures

What value will be stored in the variable t after each of the following statements executes?

A) t = (12 > 1); **Ans:** t = 1

B) t = (2 < 0); **Ans:** t = 0

C) t = (5 == (3 * 2)); **Ans:** t = 0

D) t = (5 == 5); **Ans:** t = 1

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

Ans:

```
if (y == 0)
{
        x = 100;
}
```

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

Ans:

```
if (y == 10)
{
        x = 0;
}

else
{
        x = 1;
}
```

Write an if/else statement that prints “Excellent” when score is 90 or higher, “Good” when score is between 80 and 89, and “Try Harder” when score is less than 80.

Ans:

```
if (score >= 90)
{
        cout << "Excellent";
}

else if (score >= 80 && score <= 89)
{
        cout << "Good";
}

else if (score < 80)
{
        cout << “Try Harder”;
}
```

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

Ans:

Version 1

```
If (minimum == true)
{
        hours = 10;
 }
```

Version 2

```
If (minimum)
{
        hours = 10;
}
```

Convert the following conditional expression into an if/else statement.

q = (x < y) ? (a + b) : (x * 2);

Ans:

```
if (x < y)
{
        q = (a + b);
}

else
{
        q = x * 2;
```

```
}
```

Convert the following if/else if statement into a switch statement:

```
if (choice == 1) {
      cout << fixed << showpoint << setprecision(2);
}
else if ((choice == 2) || (choice == 3)) {
      cout << fixed << showpoint << setprecision(4);
}
else if (choice == 4) {
      cout << fixed << showpoint << setprecision(6);
}
else {
      cout << fixed << showpoint << setprecision(8);
 }
```

Ans:

```
switch (choice)
{
case 1:
cout << fixed << showpoint << setprecision(2);
break;
case 2:
case 3:
cout << fixed << showpoint << setprecision(4);
break;
case 4:
cout << fixed << showpoint << setprecision(6);
break;
default:
cout << fixed << showpoint << setprecision(8);
}
```

Assume the variables x = 5, y = 6, and z = 8. Indicate if each of the following conditions is true or false:

A) (x == 5) || (y > 3) **Ans:** True.

B) (7 <= x) && (z > 4) **Ans:** False.

C) (2 != y) && (z != 4) **Ans:** True.

Assume the variables x = 5, y = 6, and z = 8. Indicate if each of the following conditions is true or false:

A) (x >= 0) || (x <= y) **Ans:** True.

B) (z - y) > y **Ans:** False.

C) !((z - y) > x) **Ans:** True.

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

Ans:

```
if (grade >= 0 && grade <= 100)
{
        cout “The number is valid”;
}
```

Write a C++ statement that prints the message “The number is valid.” if the variable temperature is within the range −50 through 150.

Ans:

```
if (temperature >= -50 && temperature <= 150)
{
        cout << "The number is valid.";
}
```

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

Ans:

```
if (hours < 0 || hours > 80)
{
        cout << "The number is not valid.";
}
```

Write a C++ statement that displays the strings title1 and title2 in alphabetical order.

Ans:

```
#include <string>

if (title 1 < title 2)
{
cout << title1 << endl << title2;
}

else
{
cout << title2 << endl << title1;
}
```

Using the following chart , write a C++ statement that assigns .10, .15, or .20 to commission, depending on the value in sales.

Sales	**Commission rate**
Less than 2000	.10
2000 – 5000	.15
Greater than 5000	.2

Ans:

```
if (sales < 2000)
{
        commission = 0.1;
}
```

```
else if (sales >= 2000 && sales <=5000)
{
        commission = 0.15;
}

else
{
        commission = 0.2;
}
```

Write one or more C++ statements that assign the correct value to discount, using the logic described here:

Assign .20 to discount if dept equals 5 and price is $100 or more.

Assign .15 to discount if dept is anything else and price is $100 or more.

Assign .10 to discount if dept equals 5 and price is less than $100.

Assign .05 to discount if dept is anything else and price is less than $100.

Ans:

```
if (dept == 5 && price >= 100)
{
        discount = .20;
}

else if (dept != 5 && price >= 100)
{
        discount = .15;
}

else if (dept == 5 && price < 100)
{
        discount = .10;
}

else
{
        discount = .05;
}
```

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

```
if (!x > 20)
```

Ans: `if (!(x > 20))`

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

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

Ans: if (count >= 0 && count <= 100)

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

```
if (count < 0 && count > 100)
```

Ans: if (count < 0 || count > 100)

The following statement should determine if x has a value other than 1 or 2. What is wrong with it?

```
if (x! = 1 || x! = 2)
```

Ans: if !(x = 1|| x! = 2)

The following program segment has errors. Identify as many as you can

```
1:  cout << "Enter your 3 test scores and I will ";
2:  << "average them:";
3:   int score1, score2, score3,  *Move to #1
4:  cin  >> score1 >> score2 >> score3;
5:  double average; *Move to #3
6:  average = (score1 + score2 + score3) / 3.0;
7:  if (average = 100);
8:        perfectScore = true;
9:  // Set the flag variable
10: cout << "Your average is " << average << endl;
11: bool perfectScore; *Move to #2
12: if (perfectScore); {
13:        cout << "Congratulations!\n";
14: cout << "That's a perfect score.\n";
15: cout << "You deserve a pat on the back!\n";
```

1: Ans: .

2: Ans: cout << “average them:”;

3: Ans: int score1, score2, score3;

4: Ans: .

5: Ans: .

6: Ans: .

7: Ans: if (average == 100) {

8: Ans: .

9: Ans: .

10: Ans: .

11: Ans: .

12: Ans: if (perfectScore) {

13: Ans: .

14: Ans: .

15: Ans:

cout << "You deserve a pat on the back!\n”;