



**Computer Science Virtual Learning**

# **HS Computer Science A**

**April 30th, 2020**



Lesson: **Summary of Conditionals**

**Objective/Learning Target:**

Recapping Our Conditionals Unit



# What is a Conditional

In this chapter you learned about **conditionals**. **Conditionals** are used to execute code when a Boolean expression is true or false. A Boolean expression is one that is either true or false like `x > 0`.



## Common Mistakes

- Using two `if`'s one after the other instead of an `if` and `else`.
- Trouble with complex conditionals which are two or more Boolean expressions joined by `&&` or `||`.
- Trouble with understanding or applying negation (`!`). See the section on DeMorgan's Laws.
- Not understanding short circuit evaluation which is that if evaluation of the first Boolean expression is enough to determine the truth of a complex conditional the second expression will not be evaluated.



# Vocabulary Practice

1. \_\_\_ Block of Statements
  2. \_\_\_ Boolean Expression
  3. \_\_\_ Complex Conditional
  4. \_\_\_ Conditional
  5. \_\_\_ DeMorgan's Laws
  6. \_\_\_ Logical and (&&)
  7. \_\_\_ logical or (| |)
  8. \_\_\_ negation
  9. \_\_\_ short circuit evaluation
  10. \_\_\_ if (Boolean expression)
  11. \_\_\_ else
  12. \_\_\_ else if (Boolean expression)
- a. used to have 3 or more possible outcomes such as if x is equal, x is greater than, or x is less than some value. It will only execute if the condition in the 'if' was false and the condition in the else if is true.
  - b. One or more statements enclosed in an open curly brace '{' and a closing curly brace '}'.
  - c. The type of evaluation used for logical and '&&' and logical or '||' expressions. If the first condition is false in a complex conditional with a logical and the second condition won't be evaluated. If the first condition is true in a complex conditional with a logical or the second condition won't be evaluated.
  - d. used to execute a statement or block of statements if the Boolean expression on the if part was false.
  - e. A mathematical or logical expression that is either true or false.
  - f. turns a true statement false and a false statement true
  - g. Rules about how to distribute a negation on a complex conditional.
  - h. used to start a conditional statement. This is followed by a statement or a block of statements that will be executed if the Boolean expression is true.
    - i. Used to execute the following statement or block of statements if one of the conditions are true
    - j. Used to only execute the following statement or block of statements if both conditions are true
    - k. Used to execute code only if a Boolean expression is true.
    - l. A Boolean expression with two or more conditions joined by a logical and '&&' or a logical or '||'.

# Code Practice with Conditionals

The following code should print `x is greater than 0` .  
However, the code has errors. Fix the code so that it compiles  
and runs correctly.

```
1 public class Test1
2 {
3     public static void main(String[] args)
4     {
5         int x = 3;
6         if (x > 0
7             System.out.println("x is greater than 0")
8         else
9             System.out.println(x is less than or equal 0");
10    }
11 }
12 }
```

There were errors compiling your code. See below.

Activity: 1 – ActiveCode (ch5Ex1q)

## Error

```
Test1.java:6: error: ')' expected
    if (x > 0
           ^
Test1.java:7: error: ';' expected
    System.out.println("x is greater than 0")
                                   ^
Test1.java:9: error: ')' expected
    System.out.println(x is less than or equal 0");
                                   ^
Test1.java:9: error: ';' expected
    System.out.println(x is less than or equal 0");
                                   ^
Test1.java:9: error: ';' expected
    System.out.println(x is less than or equal 0");
                                   ^
```



# Code Practice with Conditionals

The following code should check your guess against the answer and print that it is too low, correct, or too high. However, the code has errors. Fix the code so that it compiles and runs correctly.

```
1 public class Test1
2 {
3     public static void main(String[] args)
4     {
5         int guess = 7;
6         int answer = 9;
7         if guess < answer)
8             System.out.println("Your guess is too low");
9         else if (guess = answer)
10            System.out.println("You are right!");
11        else
12            System.println("Your guess is too high");
13    }
14 }
15
```

There were errors compiling your code. See below.

Activity: 2 -- ActiveCode (ch5Ex2q)

## Error

```
Test1.java:7: error: '(' expected
    if guess < answer)
                ^
Test1.java:8: error: unclosed string literal
    System.out.println("Your guess is too low");
                        ^
Test1.java:8: error: ';' expected
    System.out.println("Your guess is too low");
                        ^
3 errors
```

# Code Practice with Conditionals

The following code should print if you can go out or not. You can go out if you have done your homework and cleaned your room. However, the code has errors. Fix the code so that it compiles and runs correctly.

```
1 public class Test1
2 {
3     public static void main(String[] args)
4     {
5         boolean doneHomework = True;
6         boolean cleanedRoom = true;
7         if (doneHomework && cleanedRoom)
8             System.out.println("You can not go out");
9         else
10            System.out.println("You can go out");
11     }
12 }
13
```

There were errors compiling your code. See below.

Activity: 3 -- ActiveCode (ch5Ex3q)

## Error

```
Test1.java:5: error: cannot find symbol
    boolean doneHomework = True;
                          ^
symbol:   variable True
location: class Test1
1 error
```





# Check Your Understanding

1. What does the following code print when x has been set to 187?

```
if (x < 0) System.out.println("x is negative");  
else if (x == 0) System.out.println("x is zero");  
else System.out.println("x is positive");
```

- a. x is negative
- b. x is zero
- c. x is positive

2. What is the value of grade when the following code executes and score is 80?

```
if (score >= 90) grade = "A";  
if (score >= 80) grade = "B";  
if (score >= 70) grade = "C";  
if (score >= 60) grade = "D";  
else grade = "E";
```

- A. A
- B. B
- C. C
- D. D
- E. E

3. Which of the following is equivalent to the code segment below?

```
if (x > 2) x = x * 2;  
if (x > 4) x = 0;
```

- A. x = 0;
- B. if (x > 2) x \*= 2;
- C. if (x > 2) x = 0;
- D. if (x > 2) x = 0; else x \*= 2;

4. The following method will return true if and only if:

```
public boolean check(String s) {  
    return s.length() >= 2 && (s.charAt(0) ==  
        s.charAt(1) || check(s.substring(1)));  
}
```

- A. s starts with two or more of the same characters
- B. s contains two or more of the same characters
- C. s contains two or more of the same character in a row
- D. s ends with two or more of the same characters
- E. s.charAt(0) == s.charAt(1)



## Check Your Understanding

5. At a certain high school students receive letter grades based on the following scale: 93 or above is an A, 84 to 92 is a B, 75 to 83 is a C, and below 75 is an F. Which of the code segments to the right will assign the correct string to grade for a given integer score?

- A. I and III only
- B. II only
- C. III only
- D. I and II only
- E. I, II, and III

```
I.  if (score >= 93)
    grade = "A";
    if (score >= 84 && score <=92)
    grade = "B";
    if (score >=75 && score <= 83)
    grade = "C";
    if (score < 75)
    grade = "F";
```

```
II.  if (score >= 93)
    grade = "A";
    if (score >= 84)
    grade = "B";
    if (score >=75)
    grade = "C";
    if (score < 75)
    grade = "F";
```

```
III. if (score >= 93)
    grade = "A";
    else if (score >= 84)
    grade = "B";
    else if (score >=75)
    grade = "C";
    else
    grade = "F";
```



## For More Resources and to Check Answers

Go to: <https://runestone.academy/runestone/books/published/apcsareview/Conditionals/cEasyMC.html>

<https://runestone.academy/runestone/books/published/apcsareview/Conditionals/cMedMC.html>

<https://runestone.academy/runestone/books/published/apcsareview/Conditionals/cHardMC.html>

<https://runestone.academy/runestone/books/published/apcsareview/Conditionals/Summary.html>

<https://runestone.academy/runestone/books/published/apcsareview/Conditionals/Exercises.html>