Assignment 2

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True or False:

1. Java is a strongly typed language. **True**
2. Primitive types in Java are not guaranteed to be identical from computer to computer. **False**

Short Questions:

1. Java has only three kinds of control structure: the sequence statement, selection statements (three types) and repetition statements (three types). Name the three types of repetition statements.

   While, Do While, For

2. Explain the syntax of the conditional operator (?:).

   Example : `max = (a > b) ? a : b;`

   Max will be equal to a if the condition inside the parenthesis is true, or b if it is false

   Example: var = (condition) ? true : false;

3. The compound assignment operators abbreviate assignment expresions. If c = 7; is followed by C+=3; what is the new value of c?

   10

4. Assume int a = 4, b = 5, c = 6, d = 15, e = 17. Complete the following table with the proper integer value.

Expression	Explanation	Assignment
A += 6	A = a +6	10 to a
B -= 2	B = b-2	3 to b
C *= 3	C = c*3	18 to c
D /= 4	D = d/4	3 to d
E %= 5	E = remainder(e/5)	2 to e

5. What is wrong with the following **while** statement?

   While (x >= 0)

   Sum += x;

   The control variable 'x' is not being modified inside the while loop. The result is an infinite loop.

6. Suppose that the initialization expression in the **for** header declares the control variable (i.e., the control variable's type is specified before the variable name). What is the scope of this variable and where can it be employed.

   Only inside the for loop where it is declared.

7. Write a **for** header with control variable **index** such that it meets the following requirements.
   (a) Variable **index** varies from 1 to 10 in increments of 1.
   (b) Variable **index** varies from 10 to 1 in decrements of 1.
   (c) Variable **index** varies from 1 to 256 in powers of 2.

   (a) For (int index = 1; index <= 10; index++)
   (b) For(int index = 10; index >0; index ++)
   (c) For(int index = 1; index<=256; index *= 2)

8. What is a *utility method* or *helper method*?

   A 'utility' or 'helper' method are small methods used by another method to accomplish a task. This task is typically very small, short, and used often.

9. Describe the roles of the three expression in the header of a **for** statement, i.e.
   For (expression1; expression 2; expression 3);

   Expression1 is the initializer. Used to define what variable will be used for indexing and what value it starts with.
   Expression 2 is the terminating condition. When does the for loop stop?
   Expression 3 is the incrementer. The index variable will change by this amount after each iteration.

10. What happens when a local variable or parameter in a method has the same name as a field?

Example:

```
class Test {
        private int var1;

        public Test(int var1) {
                this.var1 = var1; //set the member variable
                                  // to what was passed in
        }
}
```

This is entirely possible to do. It is just a bad idea. Whenever the user wants to access the instance variable, the 'this' prefix is needed or else the local variable will 'hide' the instance variable.

11. What is *method overloading*?

Method Overloading is a feature that allows a class to have two or more method having the same name, if their argument list is different. This is often used when making constructors.