CSC 160 QUIZ 1 SOLUTIONS

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1. Name three examples of input devices on a computer system.

   (1) *keyboard*
   (2) *mouse*
   (3) *microphone*

2. Name three examples of output devices on a computer system.

   (1) *monitor*
   (2) *printer*
   (3) *speakers*

3. The part of the computer's hardware where programs and data reside while the computer is executing the program is called *central memory*.

4. Explain why a computer system needs to have *secondary storage* devices, and give two examples of secondary storage devices.

   > *Because central memory (primary memory) is volatile. This means central memory loses its contents when power is turned off. Secondary storage devices maintain their contents even when power to the computer is off.*

5. The part of the computer's hardware that fetches instructions from memory and executes them, and is regarded as the "brain" of the computer system is called the *Central Processing Unit (CPU)*.

6. Define the notions of *object* and *class* in the context of computer programming and computer programming languages.

   > *An object is a unit in a program that consists of data values called fields, and methods for working with those values. A class is a pattern for creating objects.*

7. What are the two main characteristics of a programming language *data type*?

   (1) *values: for example, the type* `int` *has values such as -2, 0, 12, etc.*
   (2) *operations: for example, the operation of the data type* `int` *include the standard arithmetic operators* $+, -, *,$ *and* $/$.

8. Explain the relationship between a *class* and *object*.

   > *A class is a pattern for creating objects. An object created from a class is called an instance of that class.*

9. Explain the difference between an *instance member* and a *static member* of a class.

> *An instance member of a class exists only in objects created from that class, and not in the class itself. Each object of the class has its own copy of the instance members. A static member of a class exists in the class itself, independently of objects of that class.*

10. A class method that has the same name as the class, and is used to create instances of that class is called a *constructor*.

11. Name all the Java primitive types.

   (1) *The integral types:* `int, short, long, byte`
   (2) *The real number types:* `float, double`
   (3) `char`
   (4) `boolean`

12. Give an example of an assignment statement, and then describe the general format of an assignment statement by giving its two main parts and showing how those two parts are related by a third part.

Example:

```
int x;   // declaration of variable
x = 12;  // assignment statement
```

> *An assignment consists of a variable on the left hand side of the assignment operator =, and an expression on the right hand side of the assignment operator:*
> ```
> variable = expression;
> ```

13. What are the constant values of the type *boolean*?

true and false.

14. Write a sequence of Java statements that asks the user to enter two integers and then prints the sum of those two integers.

```
Scanner sc = new Scanner(System.in);
int x;
int y;
System.out.print("Enter two integers: ");
x = sc.nextInt();
y = sc.nextInt();
System.out.print(x + y);
```

15. Write a sequence of Java statements that asks the user to enter two integers and then prints

`Equal`

or

`Not equal`

depending on whether the two integers entered by the user or equal or not.

```
        Scanner sc = new Scanner(System.in);
        int x;
        int y;
        System.out.print("Enter two integers: ");
        x = sc.nextInt();
        y = sc.nextInt();
        if (x == y)
        {
          System.out.print("Equal");
        }
        else
        {
          System.out.print("Not equal");
        }
```

16. Write a Java program that asks the user to enter a sentence of their choice, and then prints the first letter of that sentence, the last letter of the sentence, and the number of characters in the sentence. Here is a sample interaction of such a program with the user.

```
Please enter a sentence: The rabbit ran fast
First letter is T
Last letter is t
The number of characters is 19
```

Here is the solution

```
        Scanner sc = new Scanner(System.in);

        String str;
        System.out.print("Enter a sentence");
        str = sc.nextLine();

        int length = str.length();
        System.out.println("The first letter is " + str.charAt(0));
        System.out.println("The last letter is " + str.charAt(length-1));
        System.out.println("The number of characters is  " + length);
```