Introduction to Computer Science 1 – Homework, Module 2 (Variables, Methods)

1. Variables: Refer to the slides/code examples of Lecture 2 and the equivalent chapters of textbook(s). Why do you think we need variables?

Remind yourselves how to *declare* and/or *initialize* variables (highlight the different between the two) and then do the following on paper and then write them in a program:

-Declare an integer variable named x.
-Declare an integer variable named y and initialize it to 7.
-Declare a double variable named z and initialize it to 5.5.
-Declare an integer variable named cucumber and initialize it to the value of y.
-Try to print the content of variable x. What happens? Why?

2. Reading from keyboard: Refer to the slides/code example on how we can read values (integer or characters) from keyboard.

Where can we store the values we read from the keyboard?
Why do you think it is important to specify the type of the value we want to read from the keyboard?

Use the following code example to read integer variables from the keyboard.

```
import java.util.*;         //this should be the header

public class TestReader {
      public static void main(String[] args) {
        Scanner stdin = new Scanner(System.in);
        System.out.println("Enter integer value for a: ");
        int a;
        a = stdin.nextInt();
        System.out.println("You gave me :" + a);
    }
}
```

What happens if the user provides as input through the console 9?
What happens if the user provides as input through the console 9.9?

3. (Re)think about the difference between syntax and logical errors. Highlight one example for each category.

4. Declare one integer variable named **`Jenny`** and one double variable named **`John`**. Assign to these values some arbitrary values.

Declare one double variable named **`Jos`**.

What will happen if after the previous statements you execute:

```
Jos = Jenny + John;
```

Jos remains a double with the value of Jenny + John where Jenny will be automatically cast into a double

5. (On paper) The following method is supposed to take one integer parameter (the length of a cube) and compute and return its volume. What are the errors?

How would you call this method from **main** so as to print the volume of a cube with length 2?

```
public static void volume(int length) {
      int volumecalc = length*length*length;
      System.out.println("Volume is :+ volumecalc);
      return volume;
}
```

6. (On paper) What is the output of the following program?

```
public class MysteryNumbers {
    public static void main(String[] args) {
        String one = "two";
        String two = "three";
        String three = "1";
        int number = 20;

        sentence(one, two, 3);                    //
        sentence(two, three, 14);                 //
        sentence(three, three, number + 1);       //
        sentence(three, two, 1);                  //
        sentence("eight", three, number / 2);     //
    }
    public static void sentence(String three, String one, int number)
  {
  System.out.println(one + " times " + three + " = " + (number * 2));
  }
}
```

7. (On paper) Find and correct all errors in the following program (**do not use** the compiler)

```
public class Oops {

       public static void main(String[] args) {

              int x;

              System.out.println("x is" x);

              int x = 15.2;    // set x to 15.2

              System.out.println("x is now + x");

              int y;           // set y to 1 more than x

              y = int x + 1;

              System.out.println("x and y are " + x + and + y);
       }

}
```

SMALL PROGRAMS FOR PRACTICE

8. Start with the code below. This code contains a ready made main method but still requires you to complete two methods that take 3 integers as parameters. Make one method returnthe maximum and one method return the minimum of the three numbers. (Hint: use the `java.Mathlibrary` to accomplish this.). You can run the class to test your implementation.Then change the main method, to read in 5 numbers and output the smallest and largest numbers. (Re)Use, but do not change, the maximum and minimum methods already defined.

```
import java.util.Scanner;

public class MaxMin {


  public static int maxOf3 (int r, int s, int t) {
  …  //here goes your method code
  }

  public static int minOf3 (int r, int s, int t) {
  …  //here goes your method code
  }


  public static void main(String[] args) {
       Scanner in = new Scanner(System.in);

      int n1 = in.nextInt();
      int n2 = in.nextInt();
      int n3 = in.nextInt();

      int max = maxOf3(n1,n2,n3);
      System.out.println("Maximum: " + max);
      System.out.println("Minimum: " + min);

  }


}
```

9. Write a method that imitates the Java integer division/for doubles and returns an int type value. Write a second method that correctly rounds the doubles division to the closest integer instead ofthe smaller. Illustrate the use and correctness of both methods in your own main method.

10. Write a program that takes a temperature in Fahrenheit and then prints it to Celsius scale. Think of how you are going to proceed. First, design your program on paper (decide what tools/statements you are going to need). Then, start writing your program in Java.

Modify your program, so that you read a temperature from the keyboard and then pass that as parameter to a method which does the calculation and returns it

11. Write a program in a class named `Bday` that declares four variables and assigns appropriate values to them.

- your birthday month (1-12)
- your birthday day (1-31)
- the birthday month of a friend of yours (1-12)
- the birthday day of that friend of yours (1-31)

Ask a friend of yours that is next to you (or find one!) for their name and for the proper numbers to store in the variables for his/her birthday. Then produce output in this format using your four variables:

```
My birthday is 9/19, and Suzy's is 6/14.
```

12. Provide code for a method called `secondsToDays` that is supposed to take a number (which represents seconds) and returns the equivalent of that number in days.

Afterwards, call this method from your `main()` and print the result.

Make sure it works properly, e.g. if `secondsToDays(152327)` should return `1.76304`.

```
public class Seconds {


  public static double SecondstoDays (double seconds) {
  …  //here goes your method code
  }


  public static void main(String[] args) {
  …  //here call your method
  }


}
```