American University of Beirut
*Department of Computer Science*
*CMPS 200 – Introduction to Programming*
Lab 2: Feb 7 – Feb 11

## Exercise 1. Intro to Variables

Recall that you can use variables to store values or the result of an expression in memory and use them later on in your program.

Write a program and add the corresponding statements to do the following:

- Declare an **integer** variable named: **yearOfBirth**
- Assign to it your year of birth
- Declare another **integer** variable named: **currentYear**
- Assign to it the current year (2022)
- Declare another **integer** variable named **age** and assign to it the answer of the expression to calculate your age.
- Display the following output: *"You are x years old."*

  *(where x should be replaced by your calculated age)*

```
public static void main(String [] args){
    //declare an integer yearOFBirth

    //give a value for yearOfBirth

    //declare an integer currentYear

    //give a value for currrentYear

    //declare an integer age and calculate its value

    //print "You are x years old" (where x is replace by the calculated age)
}
```

## Exercise 2. Real Variables

There are different ways to initialize variables of type double. Try them by yourself:

```
double a1 = 23., a2 = 50e4, a3 = .4, a4 = -.65, a5 = 1e-2;
```

Print the values of the variables on separate lines using one println statement.

## Exercise 3. Errors

Find the errors in the following program. If needed, you can type it in your editor to check.

```
public class Errors {
    public static void main(String [] args){
        int x;
        System.out.println(x);

        x = 10;
        int x = 20;
        System.out.println("x is now + x");

        int y = 20.5;
    }}
```

## Exercise 4. Tracing

What will the values of the variables: ***first*** and ***second*** be after the execution of the following code? Write down your answer, then check it by copying and running the code:

```
int first = 34, second = 50;
first = first + 10;
second = first;
first = 50;
second = second + 3 + first;
second = second / 2;
```

**first =**

**second =**

## Exercise 5. Methods

Write a method, **myFirstMethod**, that takes an integer and displays it in a println statement, preceded by: “The number passed is: ”.

Call this method from the main as follows:

- myFirstMethod(25)
- myFirstMethod(x) // (where x is a declared and initialized integer)
- myFirstMethod(int x) (can you do this?)

Now create another method that takes two doubles and displays the two numbers separated with comma. Call it from inside the main method.

## Exercise 6. Errors with Methods

Find the errors in the following program. You can type it in if needed.

```
public class ErrorsWithMethods {
    public static void main(String [] args){
        int x = 20;
        int y;
        y = doubleNumber();
        System.out.println(result);
        int z;
        z = powerTwo(x);
    }
    public static int doubleNumber(int a){
        int result = a * 2;
        return result;
    }
    public static double powerTwo(double a){
        double b = a * a;
    }}
```

## Exercise 7. Methods with Parameters and Return

- Create a method, **calculateBMI**, that takes two doubles, the height and the weight, and returns the corresponding BMI (knowing that BMI = weight / height * height).

- Declare two variables in the main method: weight and height. Call the function calculateBMI. You can print out the answer directly as in:

```
System.out.println("Your BMI is: " + calculateBMI(weight, height))
```

- Or you can create a variable bmi and then print it:

```
bmi = calculateBMI(weight, height)

System.out.println("Your BMI is: " + bmi)
```