# CSE101L Computer Programming Laboratory Quiz 1

## Disclosure

You will submit your file to an assignment that is given through MS Teams. Your filename should be **Quiz1_yourStudentNumber.java**. Quiz will start at 14.30 you will have an hour to code then you will be given extra 15 minutes to finalize the upload process. Your code will be checked with plagiarism tools, any kind of code sharing and using the internet is forbidden.

**You can use any editor you would like to use. DO NOT use any Turkish character and like I mentioned in the Teams post, if your editor creates a package automatically, remove that line BEFORE turning in your java file.**

**Write every answer in the same main method.**

- Java program begins with a class definition in which the keyword **class** is followed by the class name. Don't forget to put **public** keyword in front of **class** keyword.

1. Create a java file and name your java as file Quiz1_yourStudentNumber.java. Of course, insert your student number where "yourStudentNumber" is written. Then, write the class.

- As you know, every Java program must have a **main** method where program execution begins.

2. Write the main method

- We can use comment lines to explain different parts of our code

3. For every question write a single comment line to explain what that part of your code does in short one sentence.

- In order to store a value, the program needs to declare a symbol called a **variable**. A **variable** represents a value stored in the computer's memory.

4. Write a program that **displays** the area and perimeter of a rectangle with the width of **4.5** and height of **7.9**. **Do not** read these values from the user, just store these values in variables **width** and **height** with suitable data types.

- Reading input from the console enables the program to accept input from the user. Java uses System.out to refer to the standard output device and System.in to the standard input device. To perform console output, you simply use the **println** method to display a string to the console. To read an input from the user we use a **Scanner** object. Before using Scanner class to instantiate a scanner object, we need to **import** the Scanner class from the **java.util** library.

5. Write a program that prompts the user to enter the side of a hexagon and displays its area. The formula for computing the area of a hexagon is:

$$Area = \frac{3\sqrt{3}}{2}s^2$$

Where s is the length of a side

- Naming conventions are important. Be sure to choose descriptive names for your variables. Remember that Java is case sensitive. This means *radius* and *Radius* are different variables. If your variable names consist of multiple words, be sure to follow camel case naming convention. For example, numberOfWheels instead of number_of_wheels.

6. Write a program that prompts the user to enter the distance to drive, the fuel efficiency of the car in miles per gallon, and the price per gallon, and display the cost of the trip. After displaying the result, convert the cost to lira with a **constant** of 18.59. I want you to declare that as a constant and assign the value (So don't just multiply the result with number 18.59 but use a constant to do so. Also be careful about how we name constants). After you have made the conversion to ₺, display the result in integer format(convert double to integer). *You can use the values given below to control if your program is working correctly.*

   Driving distance: 900.5
   Miles per gallon: 25.5
   Price per gallon: 3.55
   Your result should be 125.36

- A **Boolean** expression is an expression that evaluates to a **Boolean** value: **true** or **false.** Java provides six relational operators (<, <=, >, >=, ==, !=). The result of a comparison is a Boolean value, true or false.
- You can use **Math.random()** to obtain a random double value between **0.0** and **1.0**. If you want to generate a random integer value between any two number, subtract small one from the big one, add one and multiply with the random double value you have generated and finally add small number, then convert to int.

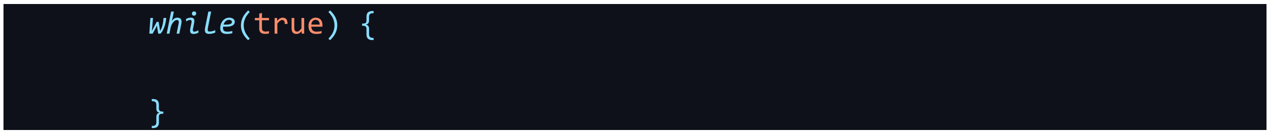
7. Jake and Mike both roll a die. Compare if their numbers are equal and store the result in a variable with suitable data type. Then, print that variable to console.

- The program can decide which statements to execute based on a condition. Selection statements use conditions that are **Boolean** expressions.
- An **if** statement is a construct that enables a program to specify alternative paths of execution.
- The logical operators **!**, **&&**, **||**, and **^** can be used to create a compound boolean expression.

8. Write a program that prompts user to enter a number between -5 and 5. If the number is **not** between -5 **and** 5, print an error message ("Not in range"). If the number is odd **or** negative, take the square of number and print it, if not take the square root of the number and print it.

- Java has several types of selection statements: One-way **if** statements, two-way **if-else** statements, nested **if** statements, multiway **else if** statements, **switch** statements and conditional expressions.
- An **if-else** statement decides the execution path based on whether the condition is true or false.
- An **if** statement can be inside another **if** statement's code block.
- Multi-way if statement is just an else block with a condition. (else if)
- A **while** loop executes statements repeatedly while the condition is true
- You can also use **break** in a **while** loop to immediately terminate the loop

*For this program to work, write your answer inside this given code block and declare your **positives** and **negatives** variables **before** the while loop.*



```
        while(true) {

        }
```

9. Write a program that prompts the user to enter a number. Declare two double variables named **positives** and **negatives** with their initial values as 0.

   If the number is positive, sum it with **positives** and store the result in **positives**. If the number is even, divide the **positives** with 2 and if the number is odd, multiply **positives** with 3 and increment once.

   If the number is negative, do the same things but with **negatives** variable, instead of dividing by 2, multiply with 2 and instead of multiplying with 3 and incrementing once, divide it by 3 and decrement once.

   If the number is zero then print the result **positives** divided by **negatives**. And inside this block after you have printed, add this keyword in a new line: **break;** this will terminate the while loop.

   *Try to use augmented assignment operators(**+=**, **-=**, ***=**, **/=**), increment and decrement(++, --).*

10. **(BONUS QUESTION)** Write a program that prompts user to enter a question number (from 4 to 9). According to user input, your corresponding solution code to that question should execute. For example if user enters 4, your solution to question-4 should be executed. If user enters 8 your solution to question 8 should be executed. If user enters anything other than 4, 5, 6, 7, 8 or 9 you should print an error message.