CS101- Algorithms and Programming I

Lab 01

Lab Objectives: first programs, debugging.

For all labs in CS 101, your solutions must conform to the CS101 style guidelines (rules!)

1. Create a project, Lab01_Q1 in your Lab01 folder.
   - Download the file Lab01_Q1.java and include it in this project. The program does not compile. Find and fix the syntax errors in the program so that it will compile and run. When it runs ***successfully*** the program will give the output shown. Check your output to ensure it appears correctly.

     Sample Run:

     Hello everyone, below are some course details
     Welcome to CS101 SPRING 2024 Lab 01
     There are: 10 lab sessions in this course.
     Labs contribute to 15.0% of your total grade.
     This lab : 1.5 points
     All lab : 15.0 points
     Please come prepared...

     Good luck!

2. Create a new project, Lab01_Q2 in the Lab01 folder. Write a Java program that calculates the results for the following expressions, and stores the results in the variables, answer1, answer2, answer3. Display the results.

$$x = \frac{23.2 - 7.1 \div 2.2}{(5.1 - 3.7) \times (3.4 + 4.2)}$$

$$y = \frac{35.7 \times 64.1 - 6.0^3}{43 + 5^2}$$

$$z = (2.1 + 8.0)^{-1/3}$$

Sample Run:

Answer1 is: 1.8771360218728648

Answer2 is: 30.476029411764703

Answer3 is: 0.4626219221630659

3. Create a new project, Lab01_Q3. Based on the information below,
   - The total area of the world is 510072000km^2.
   - 29.2% of this area is dry land and the rest is covered by water.
   - The total area of Turkey is 783562km^2.
   - 1.3% percent of Turkey is sea.

   Write a Java program that uses the information above to answer the following questions:
   1. How much of the area of the world is dry land and how much is water?
   2. How much of the area in Turkey is dry land and how much is water?
   3. What percent of the whole dry land of earth is in Turkey?
   4. What percent of all water is in Turkey?

Note: All data and results should be stored in variables (or constants where appropriate). Use meaningful names for the variables

Hints:

- Assume the area of the earth and the area of Turkey are constant values and declare them accordingly. The percent of dry land may change.
- Integers cannot hold very large numbers. You should use long variables to hold the areas' values.
- Be careful of type casting. We are not interested in the precision of the land area.

The output of the program should look the same as the sample run given below:

Sample Runs:

```
Earth has 148941024km2 dry land and 361130976km2 water.
Turkey has 773376km2 dry land and 10186km2 water.
Turkey has 0.5192498206538448 percent of the Earth's dry land.
And 0.002820583299949324 percent of the Earth's water.
```

Note: These problems may be so simple you (think you) can do them in your head, however, it is a good idea to get into the habit of designing your program (on paper) first, before implementing it; doing so will save you a lot of time in the future when the problems get much larger.