King Fahd University of Petroleum and Minerals

###### Information and Computer Science Department

**ICS 102: Introduction to Computer Programming**

**Second Semester 2017-2018 (Term 172)  
Homework No. 2  
[Posted: Tuesday 27th February 2018]  
[Due Date: Tuesday 13th March 2018 @ 11:59 PM (Before Midnight)]**

**Submission Guidelines:**

Submit a zipped file containing the following files:

* Q1.java (Java source file) containing your answer to the programming question no. 1.
* Q2.java (Java source file) containing your answer to the programming question no. 2.
* Q3.java (Java source file) containing your answer to the programming question no. 3.

PLEASE DO NOT INCLUDE .class FILES IN YOUR SUBMISSION

The zipped file should be named as follows:

**HW\_2\_XXXXXXXXX\_YourFamilyName\_Lecture\_Section\_No.zip**

where:

XXXXXXXXX is your 9 digit KFUPM ID.

YourFamilyName is your family name

Lecture\_Section\_No is the number of your ICS 102 lecture section

Submission should be made through your ICS 102 Lecture section Blackboard course page under **HW\_2 Assignment** submission link.

**Important Notes:**

* **Cheating is taken seriously**. Any cheating attempt will result in an F grade in the course.
* **EACH STUDENT IS REQUIRED TO DO THE HOMEWORK ALONE**. COPYING FROM ANY SOURCE IS REGARDED AS CHEATING.
* **No late submissions are allowed**.
* **Submissions via email are not accepted and will be simply ignored**.
* Submission of the homework solution should be in a zipped filed with the format specified above. **Any different formatting/naming will result in reducing the total homework score by half!**
* **You must use proper indentation and meaningful variable names in your programs.**

**Question 01**: Write a menu driven Java program that displays the following menu:

1. Calculate circle area.
2. Calculate sphere surface area.
3. Exit.

Please select your choice:

Your program must loop as long as the choice is not 3 or if there is **InputMismatchException**. If the choice is 1, the program prompts for and reads the circumference of a circle in centimeters. If the circumference is zero or negative, an error message is displayed, and the program displays the menu again after pressing the Enter key. If the circumference is valid, the program computes and displays the area of the circle in square centimeters and then it displays the menu again after pressing the Enter key. If the choice is 2, the program prompts for and reads the volume of a sphere in cubic centimeters. If the volume is zero or negative, an error message is displayed, and the program displays the menu again. If the volume is valid, the program computes and displays the surface area of the circle in square centimeters and then displays the menu again after pressing the Enter key. If the choice is not valid, an error message is displayed and then the menu is displayed again after pressing the Enter key.

Your program must also:

* Compute and display the average circle area if the number of valid circles is not zero.
* Compute and display the average sphere surface area if the number of valid spheres is not zero.

**Note**:

* Your program must be general and it must behave as in the sample program runs below.

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**Question 02:** Write an interactive Java program that prompts for and reads two strings each containing distinct characters [Note: You are not required to check this, assume each string input has distinct characters]. The program then creates a string which is the intersection of the two input strings. If the intersection is empty, the following is displayed: The intersection is { }.

Note: The behaviour of your program must be similar to the sample program runs below:

Sample program runs:

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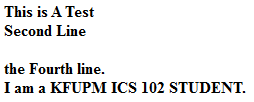
**Question 03**: Write a Java program that reads an input text-file and it writes to an output text-file the number of words that start with uppercase letter in each line of the input text-file. Your program must display an error message on the monitor if the input text-file is empty.

Hint: You may require to use a String scanner in your program.

**Note:**

* Your program must be general; it must work for any input file.
* The behaviour of your program must be similar to the sample program runs below:

Sample input file:



Sample output file:

