King Fahd University of Petroleum and Minerals

###### Information and Computer Science Department

**ICS 102: Introduction to Computer Programming**

**Summer Semester 2018-2019 (Term 183)  
Homework #1  
[Posted: Monday June 17th 2019]  
[Due Date: Monday June 24th 2019 @ 11:59 PM (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.

PLEASE DO NOT INCLUDE .class FILES IN YOUR SUBMISSION

The zipped file should be named as follows:

**HW1\_XXXXXXXXX\_YourFamilyName.zip**

where:

XXXXXXXXX is your 9 digit KFUPM ID.

YourFamilyName is your family name

Submission should be made through your ICS 102 Blackboard course page under **Assignments** 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.
* **Submission link will be available until 9:00am for late submission without penalty.**
* **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 1.**

The following formula, called Bretschneider’s Formula, relate the area of a quadrilateral, , in terms of the length of its sides and diagonals :

1. Write a Java program that asks the user as input the lengths of and and produces as output:
2. The length of the sides and the diagonals .
3. The area of the quadrilateral .
4. Confirm that the above formula is correct by entering values of quadrilaterals that are squares or rectangles.

All values should be displayed giving two decimal places.

Notes:

* If the input is not a valid number, your program must raise an ***InputMismatchException*** by displaying an appropriate error message and then terminating.
* Your program must be general and it must behave as in the sample program runs below:

Sample Program Runs (Note that green text represents input by the user)

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**Question 2.**

Consider the following rectangle completely enclosing the three triangles:

The problem is to develop a java program that takes as input the values of and and returns as output the values of and and the area of the shaded portion of the rectangle ONLY. In order to do that:

1. Analyze the problem and compute the area in terms of and .
2. Write the pseudo code algorithm.
3. Write the java program.

Notes:

* If the input is not a valid number, your program must raise an ***InputMismatchException*** by displaying an appropriate error message and then terminating.
* Your program must be general and it must behave as in the sample program runs below:

|  |
| --- |
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