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 #5  
[Posted: Tuesday July 16th 2019]  
[Due Date: Tuesday July 23th 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:

**HW5\_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:**

Create a class named Pizza that stores information about a single pizza that is being sold in a restaurant. It should contain the following:

* Private instance variables to store the size of the pizza (either small, medium, or large), the number of cheese toppings, the number of beef toppings, and the number of chicken toppings.
* Constructor(s) that set all of the instance variables.
* Public methods to get and set the instance variables.
* A public method named calcCost( ) that returns a double that is the cost of the pizza.

Pizza cost is determined by:

Small: SAR 30 + SAR 5 per topping

Medium: SAR 40 + SAR 5 per topping

Large: SAR 50 + SAR 5 per topping

* A public method named getDescription( ) that returns a String containing the pizza size, quantity of each topping, and the pizza cost as calculated by calcCost( ).
* Override the toString method and the equals method to provide suitable functionality of the Pizza class objects.
* Suitable exceptions, such as IllegalArgumentException and/or InputMismatchException, need to be handled by your code when using invalid data to set and/or change instance variables.

Write test code to create several pizzas and output their descriptions. For example, a large pizza with one cheese, one beef and two chicken toppings should cost a total of SAR 70.

**Question 2.**

Extend your solution in Question 1 by adding the following features to the Pizza class:

* A copy constructor.
* You should keep track of the total number of small, medium and large pizzas that have been sold, and the total number of toppings that have been ordered.
* You should keep track of the total sales (in Saudi Riyal) of pizzas.
* You should provide a method to the user to display a summary report on the screen that includes the following information:
  + The total number of small, medium and large pizzas sold.
  + The total number of cheese, beef and chicken toppings ordered.
  + The total revenue from selling pizzas.

Write test code to create several pizzas and then display the summary report.