CS 2401 Assignment #2

Due Date: Wednesday, September 14, 11:59PM
(See the syllabus for late policy)

Objective: The goal of this assignment is to practice array of objects.

Background: A local packaging company has contracted you to create a software to summarize their inventory.

All these years, the client has been saving dimensions of packages manufactured in a text file. While it sounds inefficient, the client is an angel from programmer's point of view. ☺ This is because it is possible to write a program that will directly read from the file client has been using so far. A sample file is shown below.

```
20 10 8
4.5 8.45 12.2
8.0 2.5 4.0
1.0 15.0 18.0
3.5 3.5 3.5
6.0 5.0 10.0
```

Plain and simply, each line contains the width, height and length of a package manufactured. The dimensions are separated by spaces.

Assignment: You need to write a program using object oriented programming idea for packages. That is, each package has to be considered an object. To achieve this, you must write a class named `Package`. The client likes to keep each class in a separate Java file. Therefore, make sure to create a Java file for the `Package` class. Some other required properties of the `Package` class are as follows.

1. All status variables of the `Package` class must be `private`.
2. Write no more than two constructors.
3. Must have a public method named `getVolume()` that will return the volume of the package.
4. Must have a public method named `isCube()` that will return true if the package is cubic, false otherwise.
5. The `Package` class must NOT contain any main method.

Feel free to write any additional method in the `Package` class, as you see fit.

The program file (the Java file that contains the main method) must be written in `Runner.java`. Runner must have the following functionalities. Each functionality must be implemented in a separate method in `Runner`.

1. Read the input text file provided by the client and create an array of `Package` objects. The sequence of the lines should be used in the sequence of objects in the array.
2. Find the smallest package in the array. Report the index, dimensions, and volume of the smallest object.
3. Find the largest package in the array. Report the index, dimensions, and volume of the largest object.
4. How many cubic packages are there in the array?
5. What are the index, dimensions, and volume of the smallest cubic package in the array? If multiple packages have the same smallest cubic size, report only the one that appeared the earliest in the input file.
6. What are the index, dimensions, and volume of the largest cubic package in the array? If multiple packages have the same largest cubic size, report only the one that appeared the earliest in the input file.
7. Report average volume of all packages.
8. Report average volume of cubic packages only.

Deliverables: You are expected to submit two Java files (`Package.java` and `Runner.java`) via Blackboard. You have to demo your programs within one week after the due date. Your demo will be based on your last submission in the Blackboard. Your TA will instruct you with further details.