Assignment 4: Reading and Programming Project due 10/2

Reading Assignment

1. Read Sections 3.2-3.4 of the textbook completing the self-test exercises.

Programming Assignment

This assignment includes two projects:

1. project Words that involves condition-controlled looping and string manipulation.
2. project HighestAverage, to practice nested loops.

Both are described in detail below.

Note the following requirement for both projects: your program must define and use at least one static method.

Programming Project

**Words:** *Words game.*

**due 11:00 p.m. on Wed, 10/2**

**worth 8 points, extra credit 2 points**

Did you ever play a two- or more person game in which players take turns naming cities, and each person must name a city that starts with a letter that was the last one in the city named right before? The game ends when a player cannot name a city that has not appeared before. For example the chain of cities *Waltham, Melburn, New-York, Katmandu* could be produced during such game.

In this assignment you will write a program for a similar game for two players. The program will let players enter words and check that each word starts with the correct letter. Since we do not have a database of all cities in the world at our disposal, the rules of the game are relaxed and players can enter any word, not just the city names. In fact, that word doesn’t even have to be a meaningful English word - for our purpose a word is any sequence of non-blank characters.

Your program should get the names of two players and then let the players take turns in inputing words. The program must terminate with a message declaring the winner when

- the entered word does not start with the right letter, or
- the word consists of a single character

The program should be case insensitive, i.e., for example, treat 'c' and 'C' as the same letter.

Here’s a sample interaction:
Greeting!
Player 1, please enter your name: Andy
Player 2, please enter your name: Fred
Andy, please enter a word: banana
Fred, please enter a word starting with letter a: Apricot
Andy, please enter a word starting with letter t: Telephone
Fred, please enter a word starting with letter e: elephant
Andy, please enter a word starting with letter t: xxx
Fred WON!

The program terminated the game because Andy entered 'xxx' which does not start with 't'.

Here is another example

Greeting!
Player 1, please enter your name: Fred
Player 2, please enter your name: Jean
Fred, please enter a word: Antananarivo
Jean, please enter a word starting with letter o: Oslo
Fred, please enter a word starting with letter o: Ottawa
Jean, please enter a word starting with letter a: A
Fred WON!

The program terminated the game when Jean entered 'A' which is a one-letter word.

The program that is going to be used for testing your code is going to check if your program terminates the game at the right moment and if it declares the winner correctly. Note that the last line of your output should consist of the winner’s name and the word ‘WON!’ only.

For extra credit (2 points): check that the input word indeed consists of letters only, otherwise, terminate the game.

Programming Project

HighestAverage: Find the highest test average due 11:00 p.m. on Wed, 10/2
worth 10 points

In this project you will create a program that computes the quiz average for students and prints out the value of the highest average.

At first, program should get the number of students in the class from the user. Then for each student in the class the user will student’s name and a list of quiz grades terminated by -1. The program should compute and print the average quiz grade for each student, and in the end output the highest average.

Here’s a sample interaction:

This program computes quiz averages for a list of students and prints out the highest average.
Please enter the number of students in the class: 3
Please enter next student’s last name: Jones
Please enter quiz grade or -1 to terminate the list: 100
Please enter quiz grade or -1 to terminate the list: 70
Please enter quiz grade or -1 to terminate the list: 100
Please enter quiz grade or -1 to terminate the list: -1
The average for Jones is 90
Please enter next student’s last name: Smith
Please enter quiz grade or -1 to terminate the list: 85
Please enter quiz grade or -1 to terminate the list: 85
Please enter quiz grade or -1 to terminate the list: -1
The average for Smith is 85
Please enter next student’s last name: Lathers
Please enter quiz grade or -1 to terminate the list: 100
Please enter quiz grade or -1 to terminate the list: 90
Please enter quiz grade or -1 to terminate the list: 90
Please enter quiz grade or -1 to terminate the list: 100
Please enter quiz grade or -1 to terminate the list: -1
The average for Lathers is 95
The highest quiz average is #95

Don’t forget to print the ‘#’ character before the highest quiz average.

Good luck, and remember that you must use static methods in both projects.