Vanier College, Continuing Education
Programming in Java
Winter 2015, Assignment-4

Teacher: Shamima Mithun   **Due Date: March 19, 2015**

Objectives

- Loop, File

Note: Please pay attention on naming convention, identation, and other programming styles. Also try to add comments.

Question 1:

Write a program that asks the user for a positive nonzero integer value. The program should use a loop to get the sum of all the integers from 1 up to the number entered. For example, if the user enters 50, the loop will find the sum of 1, 2, 3, 4 , ... , 50.

Sample runs of your program should generate the following outputs (user input is shown in blue text):

```
Input#1

Enter a positive nonzero number: -6

Invalid.

Enter a positive nonzero number: 7

The sum of all the integers from 1 through 7 is 28


Input#2

Enter a positive nonzero number: 15

The sum of all the integers from 1 through 15 is 120
```

Question 2:

Write a Java program that uses while loops to perform the following steps:

    a. Prompt the user to input two integers: `firstNum` and `secondNum`. Make sure `firstNum` is less than `secondNum`.

    b. Output all the odd numbers between `firstNum` and `secondNum` inclusive.

    c. Output the sum of all the even numbers between `firstNum` and `secondNum` inclusive.

Sample runs of your program should generate the following outputs (user input is shown in blue text):

```
Enter two numbers.

First number must be less than or equal to the second number you enter

Enter the first number: 5

Enter the second number: 17

Odd integers between 5 and 17 are:

5 7 9 11 13 15 17

Sum of even integers between 5 and 17 = 66
```

Question 3:

Write a do-while loop that asks the user to enter two numbers. The numbers should be added and the sum displayed. The loop asks the user if he or she wishes to perform the operation again. If so, the loop should repeat, otherwise it should terminate.

Sample runs of your program should generate the following outputs (user input is shown in blue text):

```
Enter two numbers.

Enter the first number: 3

Enter the second number: 25

The sum of 3 and 25 is: 28

You would like to perform the operation again? yes
```

```
Enter two numbers.

Enter the first number: -34

Enter the second number: 7

The sum of 3 and 25 is: -27

You would like to perform the operation again? no
```

Question 4:

Write a Java program that randomly generates an integer number greater than or equal to 0 and less than 100. The program then asks the user to guess the number. If the user guesses the number correctly, the program outputs an appropriate message. Otherwise, the program checks whether the guessed number is less than the random number. If the guessed number is less than the random number generated by the program, the program should display "Too low "; otherwise; the program should displays "Too high". The program then asks the user to enter another number. The user is prompted to guess the random number until the user correctly guesses the number.

The program should use the method `random()` of the class `Math` to generate a random number.

Sample runs of your program should generate the following outputs (user input is shown in blue text):

```
Enter an integer greater than or equal to 0 and less than 100: 25

Too high.

Guess again!

Enter an integer greater than or equal to 0 and less than 100: 5

Too low.

Guess again!

Enter an integer greater than or equal to 0 and less than 100: 10

Too high.

Guess again!

Enter an integer greater than or equal to 0 and less than 100: 6

Too low.

Guess again!

Enter an integer greater than or equal to 0 and less than 100: 7

You guessed the correct number.
```

Question 5:

The population of town A is less than the population of town B. However, the population of town A is growing faster than the population of town B. Write a Java program that prompts the user to enter the population and growth rate of each town. The program outputs after how many years the population of town A will be greater than or equal to the population of town B and the populations of both the towns at that time.

Sample runs of your program should generate the following outputs (user input is shown in blue text):

```
Enter the population of town A: 5000

Enter the growth rate of town A: 4

Enter the population of town B: 8000

Enter the growth rate of town B: 2

After 25 year(s) the population of town A will be greater than or

equal to the population of town B.

After 25 population of town A is 13308

After 25 population of town B is 13110
```

Question 6:

Write a Java program with a loop that lets the users enter a series of integers. The user should enter -99 to signal the end of the series. After all the numbers have been entered, the program should display the largest and smallest numbers entered.

Sample runs of your program should generate the following outputs (user input is shown in blue text):

```
Enter an integer, or -99 to quit: 56

Enter an integer, or -99 to quit: 4

Enter an integer, or -99 to quit: 67

Enter an integer, or -99 to quit: 45

Enter an integer, or -99 to quit: 7

Enter an integer, or -99 to quit: -99

Largest: 67
Smallest: 4
```

Question 7:

Suppose you are given a file consisting of students' names, and their test scores, a number between 0 and 100 (inclusive). Each line in the file consists of a student name followed by the test score. Write a Java program that outputs each student's name followed by the test score and the grade. The program also needs to output the average test score for the class.

Sample run:

Input File:

Steve Gill 89

Rita Johnson 91.5

Randy Brown 85.5

Seema Arora 76.5

Samir Mann 73

Samanta McCoy 88.5

Output File:
```
Steve       Gill        89.00       B
Rita        Johnson     91.50       A
Randy       Brown       85.50       B
Seema       Arora       76.50       C
Samir       Mann        73.00       C
Samanta     McCoy       88.50       B

Class Average: 84
```

Question 8:

Write a program that asks the user to enter the name of a file, and then asks the user to enter a character. The program should count and display the number of times that the specified character appears in the file. Use Notepad or another test editor to create a sample file that can be used to test the program.

Input file (input.txt):

This term I took the course Programming I. Programming in Java is fun.

Input:

Please enter the file name: input.txt

Please enter the character: a

Output: a appears 4 times.

Question 9
Write a Java program that asked the user for the name of a file. The program should display the contents of the file with each line preceded with a line number followed by a colon. The line numbering should start at 1.

Input file:
```
Frankie owned a
ferocious feline named
Freddy as a pet.
Freddy was funny and
furry.
His fur is bright red
with black stripes.
```

Console Output:
```
1: Frankie owned a
2: ferocious feline named
3: Freddy as a pet.
4: Freddy was funny and
5: furry.
6: His fur is bright red
7: with black stripes.
```

Question 10:
Write a program that asks the user for a positive integer no greater than 15. The program should then display a square on the screen using the character 'X'. The number entered by the user will be the length of each side of the square. For example, if the user enters 5, the program should display the following:

```
XXXXX
XXXXX
XXXXX
XXXXX
XXXXX
```

If the user enters 8, the program should display the following:

```
xxxxxxxx
xxxxxxxx
xxxxxxxx
xxxxxxxx
xxxxxxxx
xxxxxxxx
xxxxxxxx
xxxxxxxx
```

--End--