The programs for this lab should be stored in your Eclipse repository. Create a new Java project called **lab4** in your workspace. Remember to use a workspace location on your P: drive or a USB drive (not the C: drive). When your programs are running correctly, turn in a printout of the Java code for each program to the instructor. Make sure you include comments for your program (especially your name).

Problem 1

Write a new program named RomanNumerals that prompts the user to enter a number between 1 and 10 (inclusive). The program should then display the Roman numeral equivalent for that number (see http://en.wikipedia.org/wiki/Roman_numerals). If the user enters a number that is outside the range 1 – 10, the program should display an error message (see example below). You should use a single **if-else** statement for this program.

> ***Example 1:***
> ```
> Enter a number: 6
> The Roman numeral for 5 is VI.
> ```
>
> ***Example 2:***
> ```
> Enter a number: 11
> 11 is not in the range 1-10.
> ```
>
> ***Example 3:***
> ```
> Enter a number: 0
> 0 is not in the range 1-10.
> ```

Problem 2

Write a new program named Bar that prompts the user to enter a positive integer. The program should then display a line consisting of the entered number of asterisks using a ***while*** loop. If the user enters a number that is not positive, the program should display an error message (see example below).

> ***Example 1:***
> ```
> Enter a positive number: 6
> ******
> ```
>
> ***Example 2:***
> ```
> Enter a positive number: 11
> ***********
> ```
>
> ***Example 3:***
> ```
> Enter a positive number: -4
> -4 is not a positive number
> ```

Problem 3

For this problem you should use both a ***sentinel value*** to terminate a loop and a ***priming read***. Write a new class called NumberAverage that repeatedly prompts the user to enter integers until the user enters -9999. Once that value has been entered, display both the sum and average of the numbers entered. The average should be calculated as a floating point number and displayed to two decimal places. You must use a ***while*** loop for this exercise.

> *Example 1:*
> ```
> Enter an integer (-9999 to end): 2
> Enter an integer (-9999 to end): -5
> Enter an integer (-9999 to end): 1
> Enter an integer (-9999 to end): -9999
> sum = -2, average = -0.67
> ```

Problem 4

Write a program called CoinFlip that simulates flipping a coin repeatedly until three *consecutive* heads are tossed. The program should then display the total number of times the coin was flipped. The user does not have to enter any information. This problem is an example of using a ***while*** loop to repeat something an unknown number of times. You'll need to use the Random class to simulate coin flips.

> *Example:*
> ```
> Tails
> Heads
> Tails
> Tails
> Heads
> Tails
> Heads
> Heads
> Heads
> It took 9 flips to get 3 consecutive heads.
> ```

Problem 5 (Extra Credit)

Write a program class called Fibonacci that computes and prints all the Fibonacci numbers less than an integer value entered by the user. You must use a ***while*** loop for this exercise. The first two Fibonacci numbers are 0 and 1. Subsequent numbers are the sum of the two previous numbers (see http://en.wikipedia.org/wiki/Fibonacci_number).

> *Example 1:*
> ```
> Enter a positive integer: 90
> 0 1 1 2 3 5 8 13 21 34 55 89
> ```