

Programs for this lab should be stored in your Eclipse repository. Create a new Java project in your workspace called **lab6**. Remember to use a 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.

Problem 1

In an earlier lab you were asked to write a program that calculated the factorial of an integer (see <http://en.wikipedia.org/wiki/Factorial>). For this problem you are going to expand on the earlier Factorial program. Write a program called FactTwo that *repeatedly* prompts the user for integer numbers and displays their factorial, The main method should call a separate method called **fact** that computes the factorial of an integer and returns the result back to the main method. The main method should display the result and displays the factorial of that number (n!). Your program should contain **two methods**: a main method which uses a while loop to do all necessary input and output, and a separate method called **fact** that (1) accepts one integer parameter, (2) computes the factorial using a for loop, (3) returns the factorial of that integer. The **fact** method should *not* perform any input or output from the console. Input and output should only be performed by the main method.

Example 1:

```
Enter a non-negative integer (-1 to quit): 4
4! = 24
Enter a non-negative integer (-1 to quit): 0
0! = 1
Enter a non-negative integer (-1 to quit): -1
Goodbye!
```

Problem 2

Write a program called BarChart that **randomly** generates a user specified number of integers between 1 and 3. The program should keep a count of how many times each integer (1, 2 or 3) is generated. The program should then display the results as a bar chart. **Only for loops** should be used in this program... no while loops are allowed!

Example:

```
How many integers should be generated? 32
***** 14
***** 6
***** 12
```

Problem 3

Write a program called Box that prints a filled box of asterisks based on dimensions entered by the user. The program should ask the user for the length and width of a box and then print out a solid box of those dimensions. You should use **nested for loops** for this exercise.

Example:

```
Input the width of the box: 4
Input the height of the box: 5
```

```
****
****
****
****
****
```

Problem 4

Write a program called BoxOutline that prints the outline of a box using asterisks based on dimensions entered by the user. The program should ask the user for the length and width of a box and then print out a solid box of those dimensions. You should use **nested for loops** for this exercise.

Example:

```
Input the width of the box: 4
Input the height of the box: 5
```

```
****
*  *
*  *
*  *
*  *
****
```