Statistical Analysis of Dice Rolls (10 Points w/Extra Credit Option)

Create a program to roll Many N-sided dice Q times (user specified). You need two test runs: the first test run with 3 dice, 6 sides and at least 100,000 rolls and the second is a combination of your choosing (as long as the roll count is high enough). Both are required for submission. Create a bar chart that shows the frequency of each roll.

No class object is needed for this assignment. But you **Must** use the **vector** template class.

This assignment must use at least One range based for loop. I covered this in lecture. In addition there are other normal for loops.

The bar chart maximum should be 40 stars, and one roll frequency should be exactly 40 starts. You will need to determine the Maximum count and use it to scale all the results. I will talk about this in the lecture, so take notes!

Each element of the vector will have the total of times for which that number was rolled. So for example for 3 dice:

```
fCount [0] will have the number of times zero was rolled (which is 0 because you have 3 dice)!

fCount [1] will have the number of times one was rolled (which is also 0).

fCount [2] will have the number of times two was rolled (which is also 0).

fCount [3] will have the number of times three was rolled (> 0).
```

The lecture slides have an example of how to use an array to count each time some number comes up. Aka count the frequency of something.

Part of the output should look something like this (Note the '*' all start at the same number of spaces from the beginning of the line!! You MUST do the same sort of thing. Hint: setw() at just the right spot is the key to do this! And you might like string concatenation.

```
Rolled  7 **********************

Rolled  8 ****************************
```

```
Rolled  9 ***********************************
```

```
Rolled 10 ****************************************
```

Then we did an exercise this week and an example of the code to produce the bar chart. However, you will need to modify it to deal with scale the maximum line only 40 stars and all other proportionately. Your code should already have counted the occurrences of each roll, so this is simple math in the comparison phase of the inner (start producing) for loop.

Part 2 (Required):

Allow the number of rolls to be input by the user. (Range checked to a reasonable value based on the number of dice and sides)

Extra Credit:

Allow the number of dice and number of sides to be input by the user. (Range Checked). You need a vector for this assignment.