**Assignment #4 – C++ Programming for Science CHOICE A**

1. Suppose you roll a set of n dice. Then the smallest sum is n and the largest sum is 6n.

For example, if n=10, then the smallest sum is 10 and the largest sum is 60.

Let m be the desired sum of the numbers rolled. Then n <= m <= 6n.

Write a program that uses a class die to roll 10 dice. (Use an array of size 10 to implement 10 dice.)

The program prompts the user to enter the desired sum and the number of times the dice are to be rolled. The program outputs the number of times the desired sum was rolled and the probability of rolling the desired sum.

Test run your program to roll the 10 dice 10000, 100000, 1000000, 10000000 and 100000000 times with the desired sums 10, 25, 40 and 60. How many times was the sum 10 rolled? How many times was the sum 60 rolled ?

1. The first programming exercise prompted the user to input the number of times the dice were to be rolled and the desired sum, and the program output the number of times the desired sum occurred.

Modify the program from 1 as follows: Suppose you roll 4 dice 1000 times. Store the sum of the numbers rolled in each roll into an array, and then use this array to print a bar graph. Test run your program using 4, 5 and 6 dice and the number of rolls 2500, 3000 and 5000. What type of curve does the shape of your bar graph resemble?

**Assignment #4 – C++ Programming for Science CHOICE B**

Write a C++ program that simulates a lottery game.

Your program should use functions and arrays.

Define two global constants:

- **ARRAY\_SIZE** that stores the number of drawn numbers (for example 5)

-**MAX\_RANGE** that stores the highest value of the numbers ( for example 9 )

The program will use an array of five integers named **lottery**, and should generate a random number in the range of 0 through 9 for each element of the array.

The user should enter five digits, which should be stored in an integer array named **user**.

The program is to compare the corresponding elements in the two arrays and keep a count of the digits that match.

For example:

Lottery array: 7 4 9 1 3

User array : 4 2 9 7 3

There are two matching digits (elements 2 and 4).

The program should display the random numbers stored in lottery array and the numbers chosen by the user and then give the number of matching digits. If all digit match, display a message proclaiming the user a grand prize winner.