**Name:**

**Advanced Programming in C++**

**Lab Exercise 2/5/2025**

In this exercise, you will write several programs that will demonstrate some of the basic features of the C++ programming language. When you have completed your programs, you are to submit your documented source code as well as a sample.

1. Write a program that allows a user to enter a number from 1 – 99 and then prints out the Roman numeral equivalent. Note: Romans did not have 0. Hint: Use a switch or two.
2. Write a program that asks for the number of calories and fat grams in food. The program should display the percentage of calories come from fat. If the calories from fat are less than 30% of the total calories of the food, it should display a message indicating that the food is low in fat.

Notes:

One gram of fat has 9 calories so:

Calories from fat = fat grams \* 9

The percentage of calories from fat can be calculated as

Calories from fat / total calories

1. Write a program that will simulate a dice game where you are rolling two dice 1,000,000 times. Keep track of the number of times each roll value occurs and display the percentage of times each occurs. Fill out the following chart:

|  |  |
| --- | --- |
| Roll Value | Percentage |
| **2** |  |
| **3** |  |
| **4** |  |
| **5** |  |
| **6** |  |
| **7** |  |
| **8** |  |
| **9** |  |
| **10** |  |
| **11** |  |
| **12** |  |

1. Repeat problem 3 except this time, print out a histogram of the number of occurrences. Your output should look something like this:

2 X

3 XX

4 XXXX

5 XXXXXX

6 XXXXXXXX

7 XXXXXXXXXXX

8 XXXXXXXX

9 XXXXXX

10 XXXX

11 XX

12 X