Name **Roll Number:**

CS 200 Introduction To Programming
Fall 2022-2023
Lab

Lab # 2

Lab Guidelines

1. You are allowed to perform/submit the lab only during lab timings
2. Copying/sharing code is strictly **prohibited**. Using unfair means will lead to immediate disqualification

Task 1	Logic	Output			Total
	10	10			20

Task 2	Logic	Output			Total
	10	10			20

Task 3	Logic	Correct Input	Correct Output		Total
	10	15	15		40

Task 4	Question 1	Question 2	Question 3	Question 4	Total
	5	5	5	5	20

Obtained Marks: _____
Total Marks: 100

TA Signature: _____

Task 1 - You and the Two Behind You [20 Marks]

Fabbionaci series is a famous number sequence that goes something like

$$0,\ 1,\ 1,\ 2,\ 3,\ 5,\ 8,\ 13,\ 21,\ 34\ \ldots$$

This series is created by beginning with two numbers, 0 and 1, as the first and second terms of the series, respectively. The next term is created by adding the previous two terms, and the series continues forever.

For the math-minded:

$$S_{n+1} = S_n + S_{n-1} \qquad for\ n >= 2$$

Your task is to create a C++ program that recursively finds the n^{th} number of the fibonacci sequence.

Example:

```
Enter n: 5

Output: 3
```

Task 2 - It's Prime Time [20 Marks]

Write a program that takes an integer n from the user. Display all the prime numbers from 2 to n

Task 3 - Brackets Out, Pointers In [40 Marks]

Write a C++ program which has two 2x2 arrays of type int.

1. Take user input these arrays.
2. Create a function that multiplies the two arrays and prints the result.

Note: You can only use square brackets [ ] notation when declaring the arrays. For everything else, you have to use the pointer notation of arrays.

Task 4 - Trace! Trace! [20 Marks]

```
1  #include<iostream>
2  using namespace std;
3
4  int* func1(int &num2, int* ptrB)
5  {
6      int num3 = 0;
7      *ptrB = 5;
8      ptrB = &num3;
9
10     num2 = num2 * 3;
11     num2 = num2 + 25;
12
13     return &num3;
14 }
15
16 void func2(int num5, int* ptrC)
17 {
18     int num6 = num5;
19
20     ptrC = func1(num6, ptrC);
21 }
22
23 int main()
24 {
25     int num1 = 25;
26     int* ptrA = &num1;
26
27     ptrA = func1(num1, ptrA);
28     ptrA = &num1;
29
30     func2(num1, ptrA);
31
32 }
```

Q1. What is the value of num1 after Line 27 is executed? _____

Q2. What is the value of *(ptrA) after Line 27 is executed? _____

Q3. What is stored in num4 after line 30 is executed? _____

Q4. What will be printed on the console if we execute this file? _____