

Lab 1 – Cramer's Rule (In class)

CSCI 259

Problem Statement

Create a program to use Cramer's rule to solve 2x2 system of linear equation.

You can use Cramer's rule to solve the following 2x2 system of linear equation:

$$\begin{array}{l} ax + by = e \\ cx + dy = f \end{array} \quad x = \frac{ed-bf}{ad-bc} \quad y = \frac{af-ec}{ad-bc}$$

Write a program that prompts the user to enter a, b, c, d, e, and f, and displays the values for x and y.

Input Data

- The values of a, b, c, d, e, and f

Output Data

- The two equations
- The values of x and y, using the formulas above to calculate x and y

Before You Begin

1. On your flash drive, create a folder called **259 programs** (NOTE: if you are in the Adler computer labs in Weir Hall, you may also save to your H: / drive. On your personal computer, you should use a different directory)
2. Start **Visual Studio 2017** (Start > All Apps > Visual Studio 2017)
3. Click **File** → **New** → **Project**, make sure that **Visual C++** and **Win32 Console Application** are selected, type **Cramer** as your project name, **browse** to the location where you want to save your program, click **OK**, click **Finish**.

The basic C++ template is given, replace the comments with the header comments shown below

Starting File

Include header comments (i.e., **at the beginning of your file**) formatted as shown below. Your electronic submission of the program file will represent your endorsement of the Honor Code Statement.

```
/* Course: CSCI 259, Section 2
   Student Name: Jane Doe
   Student ID: 12345678
   Lab 1 in class
   Due Date:

   In keeping with the Honor Code of UM, I have neither
   given nor received assistance from anyone other than the instructor.

   Program Description:
*/
```

Algorithm

1. If you use Visual Studio, leave the line `#include "pch.h"` there, below it type `#include <iostream>`
`using namespace std;`
2. In the main function, declare variables needed for the program.

3. Prompt (ask) the user for a, b, c, d, e, and f.
4. Compute x and y based on the formulas given on previous page.
NOTE: The formulas are not in C++ syntax.
5. Output both the 2x2 equations and the values for x and y (leave **1 decimal place** for x and y).

Sample Output:

```
Enter a: 3.4
Enter b: 50.2
Enter c: 2.1
Enter d: 0.5
Enter e: 44.5
Enter f: 5.9

In the following equations
3.4x + 50.2y = 44.5
2.1x + 0.5y = 5.9

x = 2.6
y = 0.7
>>
```

6. Before each significant step, provide a comment explaining the step (do not comment every line of code).

Test Plan

In order to receive credit, you must show the instructor/TA sample output above. Also, submit your lab assignment on Blackboard under **Lab Assignments** (Click on the words **Lab 1**, scroll down to *Browse My Computer*, navigate and find the **Cramer folder**, in it, **look carefully for Cramer.cpp** (you have a bunch of files there), click **Cramer.cpp** file, scroll down, and click **Submit**).