PROJECT 1

Linear System Solver

Due Wednesday, January 22, 2020

SYNOPSIS

Write a computer (not calculator) program that will find the solution to every system of two linear equations in two unknowns. This is an individual project. It is not acceptable to copy another student's code. You may use any programming language you choose, but your code must be clear enough that I can easily identify what each step in the program is doing.

WHAT THE PROGRAM SHOULD DO

When the program is run, it should:

- Display the following:

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- Display its purpose: For instance, "Upon user input of a, b, c, d, r, and s, this program will determine the solution to the system of equations $\begin{cases} ax + by = r \\ cx + dy = s \end{cases}$."
- Prompt the user to input the values of a, b, c, d, r, s.
- Calculate the solution.
- Display the solution. If the system has no solution or infinitely many solutions, the program should say so. You may present the output with either fractions or decimals.
- Ask the user whether the user wishes to run the program again.

WHAT YOU SHOULD SUBMIT

- A printout of your code.
- Output from your program for the following systems:

$$\begin{cases} 2x + 3y = 8 \\ 5x - 4y = 9 \end{cases}, \quad \begin{cases} 2x - 5y = 8 \\ -4x + 10y = 9 \end{cases}, \quad \begin{cases} 2x - 5y = 8 \\ -4x + 10y = -16 \end{cases},$$

$$\begin{cases} 2x + 3y = 8 \\ 5x = 12 \end{cases}, \quad \begin{cases} 2x + 3y = 8 \\ 5y = 12 \end{cases}, \quad \begin{cases} 0x + 0y = 0 \\ 2x - 3y = 5 \end{cases}, \quad \begin{cases} 4x + 5y = 8 \\ 0x + 0y = 3 \end{cases}$$

- An electronic copy of the executable file for your program. The purpose of this is for me to be able to try out your program. If the programming language you have chosen makes this impractical, please visit with me to find a substitute for the executable file.