

Math 3300 Programming Assignment 1

Instructions: Work on the following 2 programs and submit your source code to me via Blackboard (you should send only 2 total files (in cpp format)). Do not send your .exe files.

1. Write a program which contains a function (other than main) which calculates values of the function $f(x) = x^3 - 3x^2 + 5x - 6$. In the main function: use this function to calculate and display the values of $f(100.81)$, $f(-74.74)$, and $f(\sqrt{50})$ to the monitor.
2. Create a computer program that calculates and outputs the inverse of a 2×2 matrix.

Recall: If given a matrix of the form: $\begin{pmatrix} a & b \\ c & d \end{pmatrix}$. You may recall that this matrix's inverse will be given by the formula: $\begin{pmatrix} d/f & -b/f \\ -c/f & a/f \end{pmatrix}$ where $f = ad - bc$.

Example: With the matrix: $\begin{pmatrix} 2 & -1 \\ 4 & -3 \end{pmatrix}$, we have that: $a = 2$, $b = -1$, $c = 4$, and $d = -3$. Then $f = ad - bc = -6 + 4 = -2$, and so the inverse is:

$$\begin{pmatrix} \frac{-3}{-2} & \frac{-(-1)}{-2} \\ \frac{-4}{-2} & \frac{2}{-2} \end{pmatrix}$$

plugging things directly into the formula above.

Your program should display to the monitor something like:

The inverse of the matrix is:

(1.5 -0.5)

(2 -1)

Use your program to calculate and display the inverses of $\begin{pmatrix} -2 & -5 \\ 1 & 3 \end{pmatrix}$

and $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$

Hint: You should declare 4 variables (at least), and assign them to different values for each matrix. You are to use your program to perform all calculations (none by hand or in your head). Your program should correctly calculate the inverse in both cases and display them like in the example above.