

Q1. Gauss Elimination With Partial Pivoting:

- (a) Write a general program for Gauss elimination with partial pivoting.
(b) With the program created, solve the following set of equations.

$$-3x_2 + 7x_3 = 2$$

$$x_1 + 2x_2 - x_3 = 3$$

$$5x_1 - 2x_2 = 2$$

Input file (**input1.txt**) is given for the above set of equations. The program needs to read from the input file and then write 2 the calculated values of x_1 , x_2 , x_3 in a text file (file name – **output1.txt**) with each x_i value in a separate line of text file

Q2. Gauss Jordan Elimination:

Q1. While solving $A\mathbf{x} = \mathbf{b}$ if you write an augmented matrix of the form

$$aug\ A \equiv [A|\mathbf{b}|I]$$

and perform Gauss-Jordan steps you end up with

$$[I|\mathbf{x}|A^{-1}]$$

- (a) Write a general program and solve the following matrix equations with the help of Gauss Jordan technique:

$$\begin{bmatrix} 1 & -1 & 2 \\ 1 & 1 & 1 \\ 2 & -2 & 3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} -8 \\ -2 \\ -20 \end{bmatrix}$$

Input file (**input2.txt**) is given for the above set of equations. The program needs to read from the input file and then write the calculated values of x_1 , x_2 , x_3 in a text file (file name – **output2.txt**) with each x_i value in a separate line of text file

(b) Evaluate A^{-1} from the same program and write a subroutine to check $A^{-1}A = I$. The program should write Matrix I in a text file (**output3.txt**) in format as shown

```
File Edit Format View Help
3
1 0 0
0 1 0
0 0 1|
```

Submission Details:

Submit a zip folder with the name: “**entrynumber.zip**” which should contain

1. code1.cpp/.c
2. output1.txt
3. code2.cpp/.c
4. output2.txt
5. output3.txt

For any doubts in assignment contact:

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