CSE2202: Numerical Methods Lab

Online 4 Section A1

Time: 60 Minutes Total: 15

Duration of online: 10.30 am to 11.30 am.

Students with odd IDs solve problems given in the set B

Students with even IDs solve problems given in the set A

Set A (Even ID)

Problem Statement: If the system is Ill conditioned the direct method cannot solve the system. So, before evaluating the following system of linear equations using Gauss Elimination you must check whether the system is ill conditioned or not.

$$7x + 7y - 7z = 2$$

$$-x + 11y + 7z = 1$$

$$11x + 5y + 7z = 0$$

Task:

1. Write a function named checkIllconditioned() to check whether the system is ill conditioned or not.
2. If the system is not ill conditioned then evaluate the system of linear equations using Gauss Elimination Method.
3. Your program must has methods named gaussElimination() for evaluating the system of linear equations.
4. If the system is ill conditioned then solve the system using iterative methods (you can use any of the methods).
5. Print the output in following input/output format:

Sample Input/Output:

Enter the size of the equations:

Enter the elements of Coefficients:

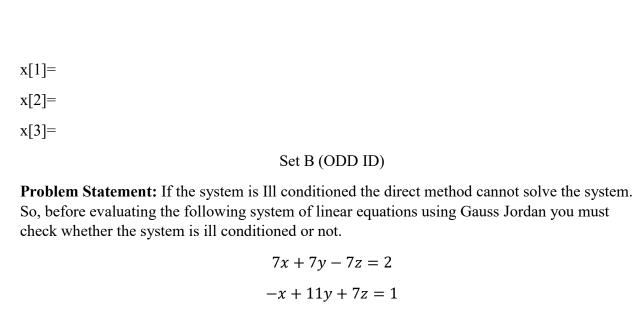The system is well conditioned and can be solved by direct methods.

The solution of linear equations is:

x[1]=

x[2]=

x[3]=

If ill conditioned then solution using Iterative methods are:

x[1]=

x[2]=

x[3]=

Set B (ODD ID)

Problem Statement: If the system is Ill conditioned the direct method cannot solve the system. So, before evaluating the following system of linear equations using Gauss Jordan you must check whether the system is ill conditioned or not.

$$7x + 7y - 7z = 2$$

$$-x + 11y + 7z = 1$$

$$11x + 5y + 7z = 0$$

Task:

1. Write a function named checkIllconditioned() to check whether the system is ill conditioned or not.
2. If the system is not ill conditioned then evaluate the system of linear equations using Gauss Jordan Method.
3. Your program must has methods named gaussJordan() for evaluating the system of linear equations.
4. If the system is ill conditioned then solve the system using iterative method you can use any of the methods).
5. Print the output in following input/output format:

Sample Input/Output:

Enter the size of the equations:

Enter the elements of Coefficients:

The system is well conditioned and can be solved by direct methods.

The solution of linear equations is:

x[1]=

x[2]=

x[3]=

If ill conditioned then solution using Iterative methods are:

x[1]=

x[2]=

x[3]=