CSE2202: Numerical Methods Lab
Online 4
Section C1
Time: 60 Minutes Total: 15

Set A

Problem Statement: Evaluate the following system of linear equations using Gauss Elimination and Inverse Matrix Method and compare the running time of both the methods.

$$4x + y + 3z = 17$$

$$x + 5y + z = 14$$

$$2x - y + 8z = 12$$

Task:

1. Write a program to evaluate the system of linear equations using Gauss Elimination Method and Gauss Seidel Method.
2. Your program must have to separate methods gaussElimination() and matrixInversion() for evaluating the system of linear equations.
3. Compare the running time for both the method to evaluate the system of linear equations and also write your observations about both the method in separate word file.
4. Print the output in following input/output format:

Sample Input/Output:

Enter the size of the equations:

Enter the elements of Coefficients:

Starting of Execution Gauss Elimination Method:

The solution of linear equations is:

x[1]=

x[2]=

x[3]=

End of Execution.....

Running Time for Gauss Elimination Method:

Starting of Execution Matrix Inverse Method:

The solution of linear equations is:

x[1]:

x[2]:

x[3]:

End of Execution.....

Running Time for Matrix Inverse Method:

Set B

Problem Statement: Evaluate the following system of linear equations using Gauss Jordan and Gauss Seidel Method and compare the running time of both the methods.

$$4x + y + 3z = 17$$

$$x + 5y + z = 14$$

$$2x - y + 8z = 12$$

Task:

1. Write a program to evaluate the system of linear equations using Gauss Jordan Method and Gauss Seidel Method.
2. Your program must have to separate methods gaussJordan() and gaussSeidel() for evaluating the system of linear equations.
3. For Gauss Seidel Method consider the initial values $x_O = y_O = z_O = 0$ and iterate until the relative error falls below 0.05.
4. Compare the running time for both the method to evaluate the system of linear equations and also write your observations about both the method in separate word file.
5. Print the output in following input/output format:

Sample Input/Output:

Enter the size of the equations:

Enter the elements of Coefficients:

Starting of Execution Gauss Jordan Method:

The solution of linear equations is:

x[1]=

x[2]=

x[3]=

End of Execution.....

Running Time for Gauss Jordan Method

Starting of Execution Gauss Seidel Method:

The solution of linear equations is:

x[1]:

x[2]:

x[3]:

End of Execution.....

Running Time for Gauss Seidel Method: