

NM Lab Sheet

II Year / II Part

Faculty: Computer/Electrical

Labsheet#6

Objectives :

1. To Implement **Gauss-Jordan Method** to find solution of following linear simultaneous equations:

$$x + y + z = 9$$

$$2x - 3y + 4z = 13$$

$$3x + 4y + 5z = 40$$

$$x = 1, y = 3, z = 5$$

$$2p + 4q - 6r = -8$$

$$p + 3q + r = 10$$

$$2p - 4q - 2r = -12$$

$$p = 1, q = 2, r = 3$$

$$x_1 + 2x_2 + x_3 - x_4 = -2$$

$$2x_1 + 3x_2 - x_3 + 2x_4 = 7$$

$$x_1 + x_2 + 3x_3 - 2x_4 = -6$$

$$x_1 + x_2 + x_3 + x_4 = 2$$

$$x_1 = 1, x_2 = 0, x_3 = -1, x_4 = 2$$

Algorithm

1. Start
2. Read the order of the matrix 'n' and read the coefficients of the linear equations.
3. Do for i=0 to n-1
 - Do for j=0 to n-1
 - If (i equal to j) then,
 - Set pivot = a[i][i]
 - Do for k=0 to n-1
 - a[j][k] = a[i][k]/pivot;
 - End for k
 - Else
 - Set pivot = a[j][i]/a[i][i]
 - Do for k=0 to n-1
 - a[j][k] = a[j][k] - pivot*a[i][k];
 - End for k
 - Endif
- End for j
- End for i
4. Display Solution:
 - Do for i=0 to n-1
 - x[i] = a[i][n]
 - Display x[i]
 - End for i
5. Stop

Lab Assignment#6

1. Solve the following equations by Gauss-Jordan Elimination Method:

a. $x + 2y + z = 8, 2x + 3y + 4z = 20, 4x + 3y + 2z = 16$

b.

$$10x - 7y + 3z + 5u = 6,$$

$$-6x + 8y - z - 4u = 5,$$

$$3x + y + 4z + 11u = 2,$$

$$5x - 9y - 2z + 4u = 7$$

c.

$$\begin{bmatrix} 0 & 2 & 2 & 4 \\ -2 & 1 & 4 & 0 \\ -1 & 3 & 0 & 2 \\ 2 & 1 & 2 & -3 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \\ u \end{bmatrix} = \begin{bmatrix} 4 \\ -7 \\ 0 \\ -7 \end{bmatrix}$$

2. Find the inverse of following matrix by Gauss-Jordan Method:

$$\begin{bmatrix} 2 & -2 & 4 \\ 2 & 3 & 2 \\ -1 & 1 & 1 \end{bmatrix}$$