

NM Lab Sheet II Year / II Part Faculty: Computer/Electrical

Labsheet#5

Objectives:

1. To Implement Basic Gauss Elimination method to find solution of following linear simultaneous equations:

$$3x + 2y + 1z = 10$$

$$2x + 3y + 2z = 14$$

$$1x + 2y + 3z = 14$$

$$x = 1, y = 2, z = 3$$

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

$$2x + 2y + z = 6$$

$$x + y + z = 0$$

$$x = 6, y = 1, z = -6$$

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

$$2x + 3y - 3z - u = 1$$

$$x + 2y + 3z - u = 10$$

$$2x - y + 2z + 3u = 7$$

$$x = 1, y = 2, z = 2, u = 1$$

Basic Gauss Elimination - Steps:

1. Declare matrix & required variables
2. Enter Augmented Matrix
3. Forward Elimination
 - a. Upper Triangular Matrix
4. Backward Substitution
5. Print Solution/Roots

Gauss Elimination Algorithm:

1. Start
2. Declare the variables and read the order of the matrix n.
3. Take the coefficients of the linear equation as:


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      Do for k=1 to n
      Do for j=1 to n+1
      Read a[k][j]
      End for j
      End for k
      
```
4. Do for k=1 to n-1


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      Do for i=k+1 to n
      Do for j=k+1 to n+1
      a[i][j] = a[i][j] - a[i][k] / a[k][k] * a[k][j]
      End for j
      End for i
      End for k
      
```
5. Compute $x[n] = a[n][n+1] / a[n][n]$

6. Do for $k=n-1$ to 1
 $sum = 0$
 Do for $j=k+1$ to n
 $sum = sum + a[k][j] * x[j]$
 End for j
 $x[k] = 1/a[k][k] * (a[k][n+1] - sum)$
 End for k
7. Display the result $x[k]$
8. Stop

Lab Assignment#5

- 1.
- 2.
- 3.
- 4.
- 5.