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

Labsheet#7

Objective

1. To Implement **Power Method** to find *dominant/largest* **Eigen Value** and corresponding **Eigen Vector.**

Algorithm

1. Start
2. Read Order of Matrix (n) and Tolerable Error (e)
3. Read Matrix A of Size n x n
4. Read Initial Guess Vector X of Size n x 1
5. Initialize: Lambda_Old = 1
6. Multiply: X_NEW = A * X
7. Replace X by X_NEW
8. Find Largest Element (Lamda_New) by Magnitude from X_NEW
9. Normalize or Divide X by Lamda_New
10. Display Lamda_New and X
11. If |Lambda_Old - Lamda_New| > e then

    set Lambda_Old = Lamda_New and goto

    step (6) otherwise goto step (12)
12. Stop

Lab Assignment#7

1. Find the Largest Eigen Value & corresponding Eigen Vector using Rayleigh's Power Method.

a. $\begin{bmatrix} 1 & 4 & -1 \\ 4 & 2 & 5 \\ -1 & 5 & 10 \end{bmatrix}$

b. $\begin{bmatrix} 2 & 5 & 1 \\ 5 & -2 & 3 \\ 1 & 3 & 10 \end{bmatrix}$

c. $\begin{bmatrix} 1 & 2 & 0 \\ 2 & 1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$

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

e. $\begin{bmatrix} 1 & 4 & 4 \\ 4 & 1 & 8 \\ 4 & 8 & 1 \end{bmatrix}$

f. $\begin{bmatrix} 2 & 2 & 1 \\ 1 & 2 & 0 \\ 0 & 3 & 1 \end{bmatrix}$