

# Matrices (Assignment + Tutorial)

classmate

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- ① If  $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$  find the sum & product of Eigen vectors & find  $\bar{A}^1 + A^2$  &  
∴ find  $\text{adj} A = ?$

- ② Find the Eigen values & Eigen vectors of  $A = \begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$

- ③ Verify Cayley-Hamilton theorem & hence find  $\bar{A}^1$  &  $A^4$  where,  $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & -1 & 4 \\ 3 & 1 & -1 \end{bmatrix}$

- ④ Show that Given matrix is diagonalizable & hence find diagonal form & Transforming matrix where  $A = \begin{bmatrix} 4 & 6 & 6 \\ 1 & 3 & 2 \\ -1 & -5 & -2 \end{bmatrix}$

- ⑤ Prove that matrix  $A$  is diagonalisable, also find diagonal form & transforming matrix  $A = \begin{bmatrix} -9 & 4 & 4 \\ -8 & 3 & 4 \\ -16 & 8 & 7 \end{bmatrix}$

- ⑥ Find eigen value of  $A^2 + 2I$   
where,  $A = \begin{bmatrix} 1 & 0 & 0 \\ 2 & -2 & 0 \\ 3 & 5 & 3 \end{bmatrix}$

- ⑦ Use Cayley-Hamilton Thm to find  $2A^4 - 5A^3 - 7A + 6I$  where  $A = \begin{bmatrix} 1 & 2 \\ 2 & 2 \end{bmatrix}$

- ⑧ Find the characteristic eqn of matrix  $A$  given below & hence find the matrix represented by  $A^8 - 5A^7 + 7A^6 - 3A^5 + A^4 - 5A^3 + 8A^2 - 2A + I$ . where  $A = \begin{bmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{bmatrix}$