



Semester : VI

Subject : Machine Learning

Academic Year: 2023 - 2024

### Trace of Matrix

In a square matrix, the sum of elements of the principal diagonal is called the 'trace of a matrix'.  
We denote the trace of matrix  $A$  by ' $\text{tr } A$ '.

Example :-

$$A = \begin{bmatrix} 1 & 1 & 4 \\ 2 & 6 & 7 \\ 0 & 4 & 5 \end{bmatrix}$$

$$\text{Then trace } A = 1 + 6 + 5 = 12$$

Example

$$A = \begin{bmatrix} 1 & 1 & 1 & 0 \\ 0 & 2 & 3 & 0 \\ 2 & 1 & 5 & 1 \\ 4 & 0 & 7 & -1 \end{bmatrix}$$

$$\begin{aligned} \text{tr}(A) &= A_{11} + A_{22} + A_{33} + A_{44} \\ &= 1 + 2 + 5 - 1 \\ &= 7 \end{aligned}$$