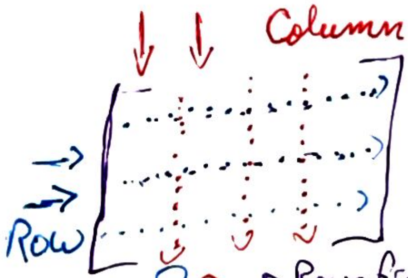
Matrix Section:

$[R][C] = [x][Y] = [i][j]$

Table of numbers, symbols, or expressions arranged in rows and Columns in mathematics and perform operations.



★ R C ⇒ Rows first

$$A = \begin{bmatrix} A_{11} & A_{12} \dots & A_{1n} \\ A_{21} & A_{22} \dots & A_{2n} \\ \vdots & & \\ A_{m1} & A_{m2} \dots & A_{mn} \end{bmatrix}$$

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

Addition: $A = \begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix} + B = \begin{bmatrix} 6 & 8 \\ 7 & 9 \end{bmatrix} = \begin{bmatrix} 7 & 11 \\ 9 & 13 \end{bmatrix} = A+B$

Subtraction is the same idea But '−'

Multiplication:
- The number of Column in the first matrix should be equal to the rows in the second

Sum

$$\underset{A=}{\begin{bmatrix} 4 & 7 \\ 2 & 6 \end{bmatrix}} \cdot \underset{B=}{\begin{bmatrix} 0.6 & -0.7 \\ -0.2 & 0.4 \end{bmatrix}} = \begin{bmatrix} (4 \cdot 0.6) + (7 \cdot -0.2) & (4 \cdot -0.7) + (7 \cdot 0.4) \\ (2 \cdot 0.6) + (6 \cdot -0.2) & (2 \cdot -0.7) + (6 \cdot 0.4) \end{bmatrix}$$

$AB_{11} = (4 \cdot 0.6) + (7 \cdot -0.2)$

$AB_{12} = (4 \cdot -0.7) + (7 \cdot 0.4)$

$AB_{21} = (2 \cdot 06) + (6 \cdot -0.2)$

$AB_{22} = (2 \cdot -0.7) + (6 \cdot 0.4)$

$$= \begin{bmatrix} 2.4 - 1.4 & -2.8 + 2.8 \\ 1.2 - 1.2 & -1.4 + 2.4 \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

Dot Product = How far are the Vectors to each other.

Measures relative direction

- Few Properties to Consider are
  - $AB \neq BA$ (Commutative)
  - $(AB)C = A(BC)$ (Associative)
  - $(B+C)A = BA + CA$, $A(B+C) = AB + AC$ (Distributive)
  - $\begin{bmatrix} 2 & 3 \\ 1 & 6 \end{bmatrix} \times \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 2 & 3 \\ 1 & 6 \end{bmatrix}$ (Identity)