

Lecture-06

Topic List



ম্যাট্রিক্সের সমতা



ম্যাট্রিক্সের গুন



গুন সংক্রান্ত math



Calculator এর সাহায্যে গুন করা

$$\begin{bmatrix} 2 & -x \\ y-1 & 2 \end{bmatrix} = \begin{bmatrix} 2 & 3+y \\ 4 & 2 \end{bmatrix} \text{ হলে } (x, y) = ?$$

$$-x = 3 + y$$

$$\therefore x + y = -3 \text{ — (i)}$$

$$y - 1 = 4$$

$$\therefore y = 5$$

$$y = 5 \text{ (i) এ বসিয়ে,}$$

$$x = -3 - 5 = -8$$

(Ans)

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}_{2 \times 2}$$

$$B = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}_{2 \times 2}$$

$$A = B$$

$$A = \begin{bmatrix} 5 & 3 \\ -1 & 2 \end{bmatrix}, B = \begin{bmatrix} 7 & 1 \\ -3 & 3 \end{bmatrix}, AB = ?$$

গুন করার
সূত্র

$$A \rightarrow m \times n$$

$$B \rightarrow p \times q$$

র ম
আম
মাবি

$AB \rightarrow$ করা যাবে যদি $n=p$ হয়

Process-01

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

$$B = \begin{bmatrix} 7 & 1 \\ -3 & 3 \end{bmatrix}$$

$$AB = \begin{bmatrix} 5 \times 7 + 3 \times (-3) & 5 \times 1 + 3 \times 3 \\ -1 \times 7 + 2 \times (-3) & -1 \times 1 + 2 \times 3 \end{bmatrix}$$

$$= \begin{bmatrix} 26 & 14 \\ -13 & 5 \end{bmatrix}$$

PT0055-02
Mehedi SIM
Special

$$A = \begin{bmatrix} 5 & 3 \\ -1 & 2 \end{bmatrix}, \quad B = \begin{bmatrix} 7 & 1 \\ -3 & 3 \end{bmatrix}$$

$$\begin{aligned} \underline{AB} &= \begin{bmatrix} 5 \times 7 + 3 \times (-3) & 5 \times 1 + 3 \times 3 \\ -1 \times 7 + 2 \times (-3) & -1 \times 1 + 2 \times 3 \end{bmatrix} \\ &= \begin{bmatrix} 26 & 14 \\ -13 & 5 \end{bmatrix} \quad \checkmark \end{aligned}$$

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 0 & 1 \end{bmatrix}, B = \begin{bmatrix} 4 & 3 \\ 2 & 1 \end{bmatrix}, C = \begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix}$$

(Handwritten: 3x2 for A, 2x2 for B)

$$BC = ?$$

(Handwritten: HW with an arrow pointing to the box)

$AB = ?$

$BC = ?$

$$AB = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} 4 & 3 \\ 2 & 1 \end{bmatrix}$$

$$= \begin{bmatrix} 1 \times 4 + 2 \times 2 & 1 \times 3 + 2 \times 1 \\ 3 \times 4 + 4 \times 2 & 3 \times 3 + 4 \times 1 \\ 0 \times 4 + 1 \times 2 & 0 \times 3 + 1 \times 1 \end{bmatrix} = \begin{bmatrix} 8 & 5 \\ 20 & 13 \\ 2 & 1 \end{bmatrix} \text{ (Ans.)}$$

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}, B = \begin{bmatrix} 0 & 2 \\ 1 & 2 \\ 0 & -1 \end{bmatrix}, \text{দেখাও যে, } \boxed{AB \neq BA}$$

$$\therefore L.H.S \neq R.H.S$$

L.H.S

$$AB = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} \begin{bmatrix} 0 & 2 \\ 1 & 2 \\ 0 & -1 \end{bmatrix}$$

$$= \begin{bmatrix} 1 \times 0 + 2 \times 1 + 3 \times 0 & 1 \times 2 + 2 \times 2 + 3 \times (-1) \\ 4 \times 0 + 5 \times 1 + 6 \times 0 & 4 \times 2 + 5 \times 2 + 6 \times (-1) \end{bmatrix}$$

$$= \begin{bmatrix} 2 & 3 \\ 5 & 12 \end{bmatrix}$$

R.H.S

$$BA = \begin{bmatrix} 0 & 2 \\ 1 & 2 \\ 0 & -1 \end{bmatrix} \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$$

$$= \begin{bmatrix} 0 \times 1 + 2 \times 4 & 0 \times 2 + 2 \times 5 & 0 \times 3 + 2 \times 6 \\ 1 \times 1 + 2 \times 4 & 1 \times 2 + 2 \times 5 & 1 \times 3 + 2 \times 6 \\ 0 \times 1 + (-1) \times 4 & 0 \times 2 + (-1) \times 5 & 0 \times 3 + (-1) \times 6 \end{bmatrix}$$

$$= \begin{bmatrix} 8 & 10 & 12 \\ 5 & 12 & 15 \\ -4 & -5 & -6 \end{bmatrix}$$

$$A = \begin{bmatrix} 3 & -4 & 2 \\ -2 & 1 & 0 \\ -1 & -1 & 1 \end{bmatrix}, B = \begin{bmatrix} 1 & 2 & -2 \\ 2 & 5 & -4 \\ 3 & 7 & -5 \end{bmatrix} \text{ হলে দেখাও যে, } \underline{AB = BA = I_3}$$

$$AB = \begin{bmatrix} 3 \times 1 + (-4) \times 2 + 2 \times 3 & 3 \times 2 + (-4) \times 5 + 2 \times 7 & 3 \times (-2) + (-4) \times (-4) + 2 \times (-5) \\ -2 \times 1 + 1 \times 2 + 0 \times 3 & -2 \times 2 + 1 \times 5 + 0 \times 7 & -2 \times (-2) + 1 \times (-4) + 0 \times (-5) \\ -1 \times 1 + (-1) \times 2 + 1 \times 3 & -1 \times 2 + (-1) \times 5 + 1 \times 7 & -1 \times (-2) + (-1) \times (-4) + 1 \times (-5) \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} = \underline{I_3}$$

$$I_3 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$BA = ?$
 → চিন্তা কর

$$A = \begin{bmatrix} 1 & 0 & 2 \\ 2 & -1 & 3 \end{bmatrix}, B = \begin{bmatrix} -3 & 1 \\ 2 & 4 \\ 1 & -2 \end{bmatrix} \text{ দেখাও যে, } (AB)' = B'A'$$

L.H.S

$$AB = \begin{bmatrix} 1 \times (-3) + 0 \times 2 + 2 \times 1 \\ 2 \times (-3) + (-1) \times 2 + 3 \times 1 \end{bmatrix}$$

$$= \begin{bmatrix} -1 & -3 \\ -5 & -8 \end{bmatrix}$$

$$(AB)' = \begin{bmatrix} -1 & -5 \\ -3 & -8 \end{bmatrix}$$

R.H.S

$$B' = \begin{bmatrix} -3 & 2 & 1 \\ 1 & 4 & -2 \end{bmatrix}$$

$$A' = \begin{bmatrix} 1 & 2 \\ 0 & -1 \\ 2 & 3 \end{bmatrix}$$

$$B'A' = ?$$

→ HW