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BSCS 5th Semester

Section "A"

Assignment

matrix

① Simple matrix
② Transpose matrix
③ Unit matrix
④ Scalar matrix
⑤ Product on $2 \times 2, 3 \times 3, 2 \times 3$ & 2×2

2×2 matrix

suppose image $A = 2 \times 2$ matrix
& image $B = $ Transpose of A (A^T)

$$A = \begin{bmatrix} 1 & 8 \\ 6 & 7 \end{bmatrix}$$

$B = A^T$

$$B = \begin{bmatrix} 1 & 6 \\ 8 & 7 \end{bmatrix}$$

multiply image A & B

$$AB = \begin{bmatrix} 1 & 8 \\ 6 & 7 \end{bmatrix} \begin{bmatrix} 1 & 6 \\ 8 & 7 \end{bmatrix}$$

$$AB = \begin{bmatrix} 1+64 & 6+56 \\ 6+56 & 36+49 \end{bmatrix}$$

$$AB = \begin{bmatrix} 65 & 64 \\ 62 & 85 \end{bmatrix}$$

unit matrix

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

$B = A^T$

$$B = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}^T$$

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

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

$$AB = \begin{bmatrix} 1+0 & 0+0 \\ 0+0 & 0+1 \end{bmatrix}$$

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

③

Scalar matrix

$A = \begin{bmatrix} 1/4 & 0 \\ 0 & 1/4 \end{bmatrix}$

$B = A^T$

$B = \begin{bmatrix} 1/4 & 0 \\ 0 & 1/4 \end{bmatrix}^T$

$B = \begin{bmatrix} 1/4 & 0 \\ 0 & 1/4 \end{bmatrix}$

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

$AB = \begin{bmatrix} 1/16 + 0 & 0 + 0 \\ 0 + 0 & 0 + 1/16 \end{bmatrix}$

$AB = \begin{bmatrix} 1/16 & 0 \\ 0 & 1/16 \end{bmatrix}$

for 3×3 matrix

let image A is 3×3 matrix

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

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$B = A^T$

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

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

$$AB = \begin{bmatrix} 4+1+9 & 2+2+0 & 6+0+6 \\ 2+2+0 & 1+4+0 & 3+0+0 \\ 0+0+0 & 3+0+0 & 9+0+4 \end{bmatrix}$$

$$AB = \begin{bmatrix} 14 & 4 & 12 \\ 4 & 5 & 3 \\ 12 & 3 & 13 \end{bmatrix}$$

for 3×2 & 2×3

let

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & 0 & 3 \end{bmatrix} , B = \begin{bmatrix} 1 & 2 \\ 5 & 3 \\ 2 & 1 \end{bmatrix}$$

(5)

$$C = \begin{bmatrix} 1 & 2 \\ 5 & 2 \end{bmatrix}$$

$A \times B = ??$

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

$$A \times B = \begin{bmatrix} 2+15+2 & 4+9+1 \\ 1+0+16 & 2+0+3 \end{bmatrix}$$

$$A \times B = \begin{bmatrix} 19 & 14 \\ 7 & 5 \end{bmatrix}$$

$A \times C = ?$

If we multiply A into C then it is not possible b/c no of rows ≠ no of colums (B).