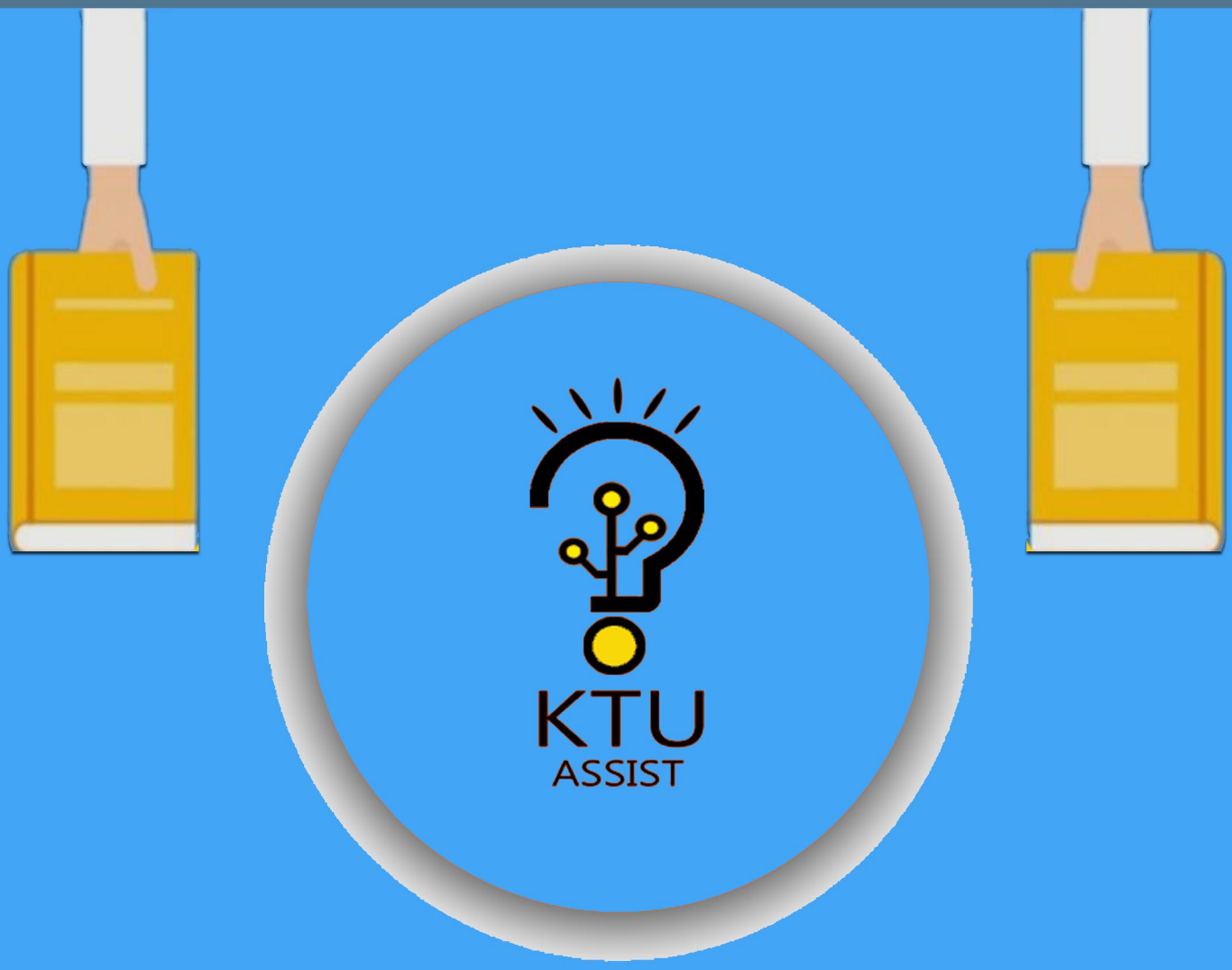
APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

STUDY MATERIALS



Multiply the following matrices

$$\left[\begin{array}{cc|cc} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \\ \hline 9 & 1 & 2 & 3 \\ 4 & 5 & 6 & 7 \end{array}\right] \times \left[\begin{array}{cc|cc} 8 & 9 & 1 & 2 \\ 3 & 4 & 5 & 6 \\ \hline 7 & 8 & 9 & 1 \\ 2 & 3 & 4 & 5 \end{array}\right]$$

$$\left[\begin{array}{c|c} A & B \\ \hline C & D \end{array}\right] * \left[\begin{array}{c|c} E & F \\ \hline G & H \end{array}\right]$$

$$A = \begin{bmatrix} 1 & 2 \\ 5 & 6 \end{bmatrix} \quad B = \begin{bmatrix} 3 & 4 \\ 7 & 8 \end{bmatrix} \quad C = \begin{bmatrix} 9 & 1 \\ 4 & 5 \end{bmatrix} \quad D = \begin{bmatrix} 2 & 3 \\ 6 & 7 \end{bmatrix}$$

$$E = \begin{bmatrix} 8 & 9 \\ 3 & 4 \end{bmatrix} \quad F = \begin{bmatrix} 1 & 2 \\ 5 & 6 \end{bmatrix} \quad G = \begin{bmatrix} 7 & 8 \\ 2 & 3 \end{bmatrix} \quad H = \begin{bmatrix} 9 & 1 \\ 4 & 5 \end{bmatrix}$$

$$P_1 = A * (F - H)$$

$$= \begin{bmatrix} 1 & 2 \\ 5 & 6 \end{bmatrix} * \left(\begin{bmatrix} 1 & 2 \\ 5 & 6 \end{bmatrix} - \begin{bmatrix} 9 & 1 \\ 4 & 5 \end{bmatrix} \right)$$

$$= \begin{bmatrix} 1 & 2 \\ 5 & 6 \end{bmatrix} * \begin{bmatrix} -8 & 1 \\ 1 & 1 \end{bmatrix}$$

$$= \begin{bmatrix} -6 & 3 \\ -34 & 11 \end{bmatrix}$$

$P_1 = A * (F - H)$
$P_2 = H * (A + B)$
$P_3 = E * (C + D)$
$P_4 = D * (G - E)$
$P_5 = (A + D) * (E + H)$
$P_6 = (B - D) * (G + H)$
$P_7 = (A - C) * (E + F)$

$$P_2 = H * (A + B)$$

$$= \begin{bmatrix} 9 & 1 \\ 4 & 5 \end{bmatrix} * \left(\begin{bmatrix} 1 & 2 \\ 5 & 6 \end{bmatrix} + \begin{bmatrix} 3 & 4 \\ 7 & 8 \end{bmatrix} \right) = \begin{bmatrix} 9 & 1 \\ 4 & 5 \end{bmatrix} * \begin{bmatrix} 4 & 6 \\ 12 & 14 \end{bmatrix} = \begin{bmatrix} 48 & 68 \\ 76 & 94 \end{bmatrix}$$

$$P_3 = E * (C + D)$$

$$= \begin{bmatrix} 8 & 9 \\ 3 & 4 \end{bmatrix} * \left(\begin{bmatrix} 9 & 1 \\ 4 & 5 \end{bmatrix} + \begin{bmatrix} 2 & 3 \\ 6 & 7 \end{bmatrix} \right) = \begin{bmatrix} 8 & 9 \\ 3 & 4 \end{bmatrix} * \begin{bmatrix} 11 & 4 \\ 10 & 12 \end{bmatrix} = \begin{bmatrix} 178 & 140 \\ 73 & 60 \end{bmatrix}$$

$$P_4 = D * (G - E)$$

$$= \begin{bmatrix} 2 & 3 \\ 6 & 7 \end{bmatrix} * \left(\begin{bmatrix} 7 & 8 \\ 2 & 3 \end{bmatrix} - \begin{bmatrix} 8 & 9 \\ 3 & 4 \end{bmatrix} \right) = \begin{bmatrix} 2 & 3 \\ 6 & 7 \end{bmatrix} * \begin{bmatrix} -1 & -1 \\ -1 & -1 \end{bmatrix} = \begin{bmatrix} -5 & -5 \\ -13 & -13 \end{bmatrix}$$