

$$A = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1m} \\ \vdots & \vdots & & \vdots \\ a_{n1} & a_{n2} & \dots & a_{nm} \end{bmatrix} \quad B = \begin{bmatrix} b_{11} & \dots & b_{1k} \\ b_{21} & \dots & b_{2k} \\ \vdots & & \vdots \\ b_{m1} & \dots & b_{mk} \end{bmatrix}$$

$$A \times B = \begin{bmatrix} a_{11} & \dots & a_{1m} \\ \vdots & & \vdots \\ a_{n1} & & a_{nm} \end{bmatrix} \times \begin{bmatrix} b_{11} & \dots & b_{1k} \\ \vdots & & \vdots \\ b_{m1} & \dots & b_{mk} \end{bmatrix}$$

$$A \times B = \begin{bmatrix} a_{11} \times b_{11} + a_{12} \times b_{21} + \dots + a_{1m} \times b_{m1} & \dots & a_{11} \times b_{1k} + a_{12} \times b_{2k} + \dots + a_{1m} \times b_{mk} \\ \vdots & & \vdots \\ a_{n1} \times b_{11} + a_{n2} \times b_{21} + \dots + a_{nm} \times b_{m1} & \dots & a_{n1} \times b_{1k} + a_{n2} \times b_{2k} + \dots + a_{nm} \times b_{mk} \end{bmatrix}$$

$$\begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix} \times \begin{bmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{bmatrix}$$

$$= \begin{bmatrix} a_{11} \times b_{11} + a_{12} \times b_{21} & a_{11} \times b_{12} + a_{12} \times b_{22} \\ a_{21} \times b_{11} + a_{22} \times b_{21} & a_{21} \times b_{12} + a_{22} \times b_{22} \end{bmatrix}$$

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$$\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix} \times \begin{bmatrix} b_{11} & b_{12} & b_{13} \\ b_{21} & b_{22} & b_{23} \\ b_{31} & b_{32} & b_{33} \end{bmatrix}$$

$$= \begin{bmatrix} a_{11} \cdot b_{11} + a_{12} \cdot b_{21} + a_{13} \cdot b_{31} & a_{11} \cdot b_{12} + a_{12} \cdot b_{22} + a_{13} \cdot b_{32} & a_{11} \cdot b_{13} + a_{12} \cdot b_{23} + a_{13} \cdot b_{33} \\ a_{21} \cdot b_{11} + a_{22} \cdot b_{21} + a_{23} \cdot b_{31} & a_{21} \cdot b_{12} + a_{22} \cdot b_{22} + a_{23} \cdot b_{32} & a_{21} \cdot b_{13} + a_{22} \cdot b_{23} + a_{23} \cdot b_{33} \\ a_{31} \cdot b_{11} + a_{32} \cdot b_{21} + a_{33} \cdot b_{31} & a_{31} \cdot b_{12} + a_{32} \cdot b_{22} + a_{33} \cdot b_{32} & a_{31} \cdot b_{13} + a_{32} \cdot b_{23} + a_{33} \cdot b_{33} \end{bmatrix}$$

SORU: $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 1 & 1 & 1 \end{bmatrix} \times \begin{bmatrix} 4 & 5 & 6 \\ 7 & 8 & 9 \\ 4 & 5 & 7 \end{bmatrix} = ?$

$\underbrace{\begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 1 & 1 & 1 \end{bmatrix}}_A \times \underbrace{\begin{bmatrix} 4 & 5 & 6 \\ 7 & 8 & 9 \\ 4 & 5 & 7 \end{bmatrix}}_B = ?$

$$= \begin{bmatrix} 1 \times 4 + 2 \times 7 + 3 \times 4 & 1 \times 5 + 2 \times 8 + 3 \times 5 & 1 \times 6 + 2 \times 9 + 3 \times 7 \\ 2 \times 4 + 3 \times 7 + 4 \times 4 & 2 \times 5 + 3 \times 8 + 4 \times 5 & 2 \times 6 + 3 \times 9 + 4 \times 7 \\ 1 \times 4 + 1 \times 7 + 1 \times 4 & 1 \times 5 + 1 \times 8 + 1 \times 5 & 1 \times 6 + 1 \times 9 + 1 \times 7 \end{bmatrix}$$

$$= \begin{bmatrix} 4 + 14 + 12 & 5 + 16 + 15 & 6 + 18 + 21 \\ 8 + 21 + 16 & 10 + 24 + 20 & 12 + 27 + 28 \\ 4 + 7 + 4 & 5 + 8 + 5 & 6 + 9 + 7 \end{bmatrix}$$

$$= \begin{bmatrix} 30 & 36 & 45 \\ 45 & 54 & 67 \\ 15 & 18 & 22 \end{bmatrix}$$