

$$A = \begin{bmatrix} 2 & 1 & 2 \\ 4 & 0 & 1 \\ 1 & -1 & 2 \end{bmatrix}$$

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

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

$$= \begin{bmatrix} (2+3+0) & (4+1+2) & (0+1+2) \\ (4+0+0) & (8+0+1) & (0+0+1) \\ (1-3+0) & (2-1+2) & (0-1+2) \end{bmatrix}$$

$$AB = \begin{bmatrix} 5 & 7 & 3 \\ 4 & 9 & 1 \\ -2 & 3 & 1 \end{bmatrix}$$