Metodos Numericos

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Ejercicio

$$A = \begin{bmatrix} 5 & 1 & 2 \\ 1 & 3 & 7 \\ 2 & 7 & 8 \end{bmatrix} \qquad B = \begin{bmatrix} 3 & 4 \\ 7 & 3 \\ 8 & 1 \end{bmatrix}$$

$(n \times m)$ $\quad$ $(m \times l)$ $\quad \Rightarrow \quad C_{3\times 2}$

(3×3) $\quad$ (3×2)

$$[C] = [A][B] = \begin{bmatrix} C_{11} & C_{12} \\ C_{21} & C_{22} \\ C_{31} & C_{32} \end{bmatrix}$$

donde usamos: $C_{ij} = \sum_{k=1}^{n} A_{ik} B_{kj}$

$$C_{11} = \sum_{k=1}^{n} A_{1k} B_{k1} = A_{11} \cdot B_{11} + A_{12} \cdot B_{21} + A_{13} \cdot B_{31}$$

$$C_{11} = 5 \cdot 3 + 1 \cdot 7 + 2 \cdot 8 = 15 + 7 + 16 = 38$$

$$C_{12} = \sum_{k=1}^{n} A_{1k} B_{k2} = A_{11} \cdot B_{12} + A_{12} \cdot B_{22} + A_{13} \cdot B_{32}$$

$$= 5 \cdot 4 + 1 \cdot 3 + 2 \cdot 1 = 20 + 3 + 2 = 25$$

$$C_{22} = \sum_{k=1}^{n} A_{2k} B_{k2} = A_{21} \cdot B_{12} + A_{22} \cdot B_{22} + A_{23} \cdot B_{32} = (1)(4) + (3)(3) + (7)(1)$$

$$C_{22} = 4 + 9 + 7 = 20$$

$$C_{21} = \sum_{k=1}^{n} A_{2k} B_{k1} = A_{21} \cdot B_{11} + A_{22} \cdot B_{21} + A_{23} \cdot B_{31} = (1)(3) + (3)(7) + (7)(8)$$

$$C_{21} = 3 + 21 + 56 = 90$$

$$C_{31} = \sum_{k=1}^{n} A_{3k} B_{k1} = A_{31} \cdot B_{11} + A_{32} \cdot B_{21} + A_{33} \cdot B_{31} = (2)(3) + (7)(7) + (8)(8) = 119$$

$$C_{32} = \sum_{k=1}^{n} A_{3k} B_{k2} = A_{31} \cdot B_{12} + A_{32} \cdot B_{22} + A_{33} \cdot B_{32} = (2)(4) + (7)(3) + (8)(1) = 37$$

$$[C] = [A][B] = \begin{bmatrix} 38 & 25 \\ 80 & 20 \\ 119 & 37 \end{bmatrix}$$