

Tarea N° 2

1

Matriz A = Precio Al por mayor de €/pieza

Matriz B = N° de Unidades de cada Pieza de equipo comprado.

Calcule $P = (AB)C$ e interprete el resultado

$$A = \begin{bmatrix} 200 & 100 \\ 200 & 150 \\ 400 & 300 \end{bmatrix} 3 \times 2$$

$$B = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 2 \end{bmatrix} 2 \times 3$$

$$AB = D$$

donde

$$3 \times 2 \quad 2 \times 3$$

$$D = \begin{bmatrix} d_{11} & d_{12} & d_{13} \\ d_{21} & d_{22} & d_{23} \\ d_{31} & d_{32} & d_{33} \end{bmatrix}$$

$$\begin{aligned} c_{11} &= (200 \cdot 1) + (100 \cdot 2) = 400 \\ c_{12} &= (200 \cdot 2) + (100 \cdot 4) = 800 \\ c_{13} &= (200 \cdot 3) + (100 \cdot 2) = 800 \\ c_{21} &= (200 \cdot 1) + (150 \cdot 2) = 500 \\ c_{22} &= (200 \cdot 2) + (150 \cdot 4) = 1000 \\ c_{23} &= (200 \cdot 3) + (150 \cdot 2) = 900 \\ c_{31} &= (400 \cdot 1) + (300 \cdot 2) = 1000 \\ c_{32} &= (400 \cdot 2) + (300 \cdot 4) = 2000 \\ c_{33} &= (400 \cdot 3) + (300 \cdot 2) = 1800 \end{aligned}$$

$$D = \begin{bmatrix} 400 & 800 & 800 \\ 500 & 1000 & 900 \\ 1000 & 2000 & 1800 \end{bmatrix} 3 \times 3$$

$$C = \begin{bmatrix} 0.006 & 0.01 \\ 0.06 & 0.01 \\ 0.006 & 0.01 \end{bmatrix} 3 \times 2$$

$$(AB)C = DC = E$$

donde

$$3 \times 3 \quad 3 \times 2$$

$$E = \begin{bmatrix} e_{11} & e_{12} \\ e_{21} & e_{22} \\ e_{31} & e_{32} \end{bmatrix}$$

$$\begin{aligned} e_{11} &= (400 \cdot 0.006) + (800 \cdot 0.06) + (800 \cdot 0.006) = 52.2 \\ e_{12} &= (400 \cdot 0.01) + (800 \cdot 0.01) + (800 \cdot 0.01) = 20 \\ e_{21} &= (500 \cdot 0.006) + (1000 \cdot 0.06) + (900 \cdot 0.006) = 68.4 \\ e_{22} &= (500 \cdot 0.01) + (1000 \cdot 0.01) + (900 \cdot 0.01) = 24 \\ e_{31} &= (1000 \cdot 0.006) + (2000 \cdot 0.06) + (1800 \cdot 0.006) = 136.8 \\ e_{32} &= (1000 \cdot 0.01) + (2000 \cdot 0.01) + (1800 \cdot 0.01) = 48 \end{aligned}$$

	Estado	Ciudad
$E =$	52.2	20
	68.4	24
	136.8	48

Después de las compras realizadas se obtuvieron los impuestos totales tanto del estado como de la ciudad.

2

$$9x_1 + 9x_2 - 7x_3 = 6$$

$$-7x_1 \quad 0 \quad -x_3 = -10$$

$$9x_1 + 6x_2 + 8x_3 = 45$$

$$A = \left(\begin{array}{ccc|c} 9 & 9 & -7 & 6 \\ -7 & 0 & -1 & -10 \\ 9 & 6 & 8 & 45 \end{array} \right) \begin{array}{l} R_1 \\ R_2 \\ R_3 \end{array}$$

$$R_1(-9) = \begin{array}{ccc|c} 1 & 1 & -7 & 6 \\ -7 & 0 & -1 & -10 \\ 9 & 6 & 8 & 45 \end{array}$$

$$\begin{array}{ccc|c} 1 & 1 & -7 & 6 \\ -7 & 0 & -1 & -10 \\ 9 & 6 & 8 & 45 \end{array}$$

$$\begin{array}{ccc|c} 1 & 1 & -15 & -2 \end{array} NR_1$$

$$A = \left(\begin{array}{ccc|c} 1 & 1 & -15 & -2 \\ -7 & 0 & -1 & -10 \\ 9 & 6 & 8 & 45 \end{array} \right) \begin{array}{l} R_1 \\ R_2 \\ R_3 \end{array}$$

$$R_2 \rightarrow R_1(7) + R_2 = \begin{array}{ccc|c} 7 & 7 & -105 & -14 \\ -7 & 0 & -1 & -10 \\ 9 & 6 & 8 & 45 \end{array}$$

$$\begin{array}{ccc|c} 0 & 7 & -106 & -24 \end{array} NR_2$$

$$A = \left[\begin{array}{ccc|c} 1 & 1 & -15 & -2 \\ 0 & 7 & -106 & -24 \\ 9 & 6 & 8 & 45 \end{array} \right] \begin{array}{l} R_1 \\ R_2 \\ R_3 \end{array}$$

$$R_3 \rightarrow R_1(-9) + R_3 = \begin{array}{ccc|c} -9 & -9 & -135 & 18 \end{array}$$

$$NR_3 \left[\begin{array}{ccc|c} 9 & 6 & 8 & 45 \\ 0 & -3 & 143 & 63 \end{array} \right]$$

$$A = \left[\begin{array}{ccc|c} 1 & 1 & -15 & -2 \\ 0 & 7 & -106 & -24 \\ 0 & -3 & 143 & 63 \end{array} \right] \begin{array}{l} R_1 \\ R_2 \\ R_3 \end{array}$$

$$R_2 \rightarrow R_2(1/7) = R_2/7 = \begin{array}{ccc|c} 0 & 1 & -106/7 & -24/7 \end{array}$$

$$NR_2 \left[\begin{array}{ccc|c} 0 & 1 & -106/7 & -24/7 \end{array} \right]$$

$$A = \left[\begin{array}{ccc|c} 1 & 1 & -15 & -2 \\ 0 & 1 & -106/7 & -24/7 \\ 0 & -3 & 143 & 63 \end{array} \right] \begin{array}{l} R_1 \\ R_2 \\ R_3 \end{array}$$

$$R_1 \rightarrow R_2(-1) + R_1 = \begin{array}{ccc|c} 0 & -1 & 106/7 & 24/7 \\ 1 & 1 & -15 & -2 \end{array}$$

$$NR_1 \left[\begin{array}{ccc|c} 1 & 0 & 1/7 & 10/7 \end{array} \right]$$

$$A = \left[\begin{array}{ccc|c} 1 & 0 & \frac{1}{7} & \frac{10}{7} \\ 0 & 1 & -\frac{100}{7} & -\frac{24}{7} \\ 0 & -3 & 143 & 63 \end{array} \right] \begin{array}{l} R1 \\ R2 \\ R3 \end{array}$$

$$R3 \rightarrow R2(3) + R3 = 0 \quad 3 \quad -\frac{300}{7} \quad -\frac{72}{7}$$

$$NR3 \left[\begin{array}{ccc|c} 0 & -3 & 143 & 63 \\ 0 & 0 & \frac{701}{7} & \frac{369}{7} \end{array} \right]$$

$$A = \left[\begin{array}{ccc|c} 1 & 0 & \frac{1}{7} & \frac{10}{7} \\ 0 & 1 & -\frac{100}{7} & -\frac{24}{7} \\ 0 & 0 & \frac{701}{7} & \frac{369}{7} \end{array} \right] \begin{array}{l} R1 \\ R2 \\ R3 \end{array}$$

$$R3 \rightarrow R3\left(\frac{7}{701}\right) = \left(0 \quad 0 \quad 1 \quad \frac{369}{701} \right) \left(\frac{7}{701} \right)$$

$$NR3 \left[\begin{array}{ccc|c} 0 & 0 & 1 & \frac{369}{701} \end{array} \right]$$

$$A = \left[\begin{array}{ccc|c} 1 & 0 & \frac{1}{7} & \frac{10}{7} \\ 0 & 1 & -\frac{100}{7} & -\frac{24}{7} \\ 0 & 0 & 1 & \frac{369}{701} \end{array} \right] \begin{array}{l} R1 \\ R2 \\ R3 \end{array}$$

$$R1 \rightarrow R3\left(-\frac{1}{7}\right) + R1 = 0 \quad 0 \quad -\frac{1}{7} \quad -\frac{369}{4907}$$

$$1 \quad 0 \quad \frac{1}{7} \quad \frac{10}{7}$$

$$NR1 \left[\begin{array}{ccc|c} 1 & 0 & 0 & \frac{6641}{4907} \end{array} \right]$$

$$A = \left[\begin{array}{ccc|c} 1 & 0 & 0 & \frac{6641}{4907} \\ 0 & 1 & -\frac{100}{7} & -\frac{24}{7} \\ 0 & 0 & 1 & \frac{369}{701} \end{array} \right] \begin{array}{l} R1 \\ R2 \\ R3 \end{array}$$

$$R2 \rightarrow R3 \left(\frac{100}{7} \right) + R2 = \begin{array}{ccc|c} 0 & 0 & \frac{100}{107} & \frac{36900}{4907} \\ 0 & 1 & -\frac{100}{7} & -\frac{24}{7} \end{array}$$

$$NR2 \left[\begin{array}{ccc|c} 0 & 1 & 0 & \frac{2868}{701} \end{array} \right]$$

$$A = \left[\begin{array}{ccc|c} 1 & 0 & 0 & \frac{6641}{4907} \\ 0 & 1 & 0 & \frac{2868}{701} \\ 0 & 0 & 1 & \frac{369}{701} \end{array} \right]$$

Evaluando en la ecuación:

$$9x_1 + 9x_2 - 7x_3 = 6 \quad X$$

$$-7x_1$$

$$-x_3 = -10 \quad \checkmark$$

$$9x_1 + 6x_2 + 8x_3 = 45 \quad X$$

