

## EJERCICIO N° 2

$$X = \begin{pmatrix} 1 & 2 & 7 \\ 1 & 4 & 1 \\ 1 & 6 & 7 \\ 1 & 3 & 2 \\ 1 & 1 & 5 \end{pmatrix} \quad \bar{e} = \begin{pmatrix} 4 \\ x \\ 3 \\ y \\ z \end{pmatrix}$$

- Estimar la Varianza de la Perturbación aleatoria y la Matriz de Covarianza del Modelo.

## PROPIEDADES

1.  $X' \cdot \bar{e} = 0$

$$X' \cdot \bar{e} = \begin{pmatrix} 1 & 1 & 1 & 1 & 1 \\ 2 & 4 & 6 & 3 & 1 \\ 7 & 1 & 7 & 2 & 5 \end{pmatrix} \begin{pmatrix} 4 \\ x \\ 3 \\ y \\ z \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$$

$$4 + x + 3 + y + z = 0$$

$$8 + 4x + 18 + 3y + z = 0$$

$$28 + x + 21 + 2y + 5z$$

$$\begin{cases} x + y + z = -7 \\ 4x + 3y + z = -26 \\ x + 2y + 5z = -49 \end{cases}$$

$$y + 4z = -42$$

$$5y + 19z = -170$$

$$-5y - 20z = 210$$

$$z = -40$$

$$4x + 8y + 20z = -196$$

$$x = -5$$

$$y = 38$$

$$z = 40$$

$$SRC = \sum \bar{lt}^2 = 4^2 - 5^2 + 3^2 + 38 - 40^2 = 3094$$

$$\hat{\sigma}^2 = \frac{SRC}{n-k} = \frac{3094}{5-3} = 1547$$

