

viernes, 13 de mayo de 2022 9:19

Tarea: Demostrar

$$\Sigma = \text{Cov}(X) = LL' + \Psi \quad (I)$$

$$\text{Pista: } (X - \mu)(X - \mu)' = LF + \varepsilon$$

$$\text{Cov}(X, F) = L \quad (II)$$

$$\text{Cov}(X, F)$$

$$X - \mu = LF + \varepsilon$$

$$X = LF + \mu + \varepsilon$$

$$\text{Cov}(X, F)$$

$$= E[XF']$$

$$- E[X]E[F']$$

$$= E[(LF + \varepsilon)F']$$

$$= LE[F'F']$$

$$= LE[F'F']$$

$$= LE[F'F']$$

$$= LE[I]$$

$$= L$$

$$\begin{aligned}
 \text{Cov}(X) &= E[(X - \mu)(X - \mu)'] \\
 &= E[(L\beta + \varepsilon)(L\beta + \varepsilon)'] \\
 &= E[L\beta\beta' L' + \cancel{L\beta\varepsilon'} + \cancel{\varepsilon\beta' L'} + \varepsilon\varepsilon'] \\
 &= L E[\beta\beta'] L' + E[\varepsilon\varepsilon']
 \end{aligned}$$

$$L I L' + \psi$$

$$= L I L' + \psi$$

✓

$$\text{Cov}(Y) = I \quad \text{TAREA}$$



