

Produto de Kronecker

$$\underline{Y} = \begin{pmatrix} Y_1 \\ Y_2 \end{pmatrix}, \quad Y_1: \text{peso}, Y_2: \text{altura}$$

$$\text{Var}(\underline{Y}) = \begin{pmatrix} \sigma_{11} & \sigma_{12} \\ \sigma_{12} & \sigma_{22} \end{pmatrix} = \Sigma$$

$$\underline{Y}_1, \underline{Y}_2, \underline{Y}_3 \text{ a.a. de } \underline{Y}$$

$$\underline{Z} = \begin{pmatrix} \underline{Y}_1 \\ \underline{Y}_2 \\ \underline{Y}_3 \end{pmatrix}$$

$$\text{Var}(\underline{Z}) = \begin{pmatrix} \text{Var}(\underline{Y}_1) & \text{Cov}(\underline{Y}_1, \underline{Y}_2) & \text{Cov}(\underline{Y}_1, \underline{Y}_3) \\ \text{Sim.} & \text{Var}(\underline{Y}_2) & \text{Cov}(\underline{Y}_2, \underline{Y}_3) \\ & & \text{Var}(\underline{Y}_3) \end{pmatrix}$$

$$\text{Var}(\underline{Z}) = \begin{pmatrix} \Sigma & 0 & 0 \\ 0 & \Sigma & 0 \\ 0 & 0 & \Sigma \end{pmatrix} = I_3 \otimes \Sigma.$$