Esercizio 4

lunedì 24 maggio 2021 18:39

$X = (X_1, X_2)$

X_2 \ X_1	2	4	6	
1	0.2	0.3	0.3	0.7
3	0.2	0.1	0.1	0.3
	0.2	0.4	0.4	

$P(X_1 = 2) = 0.1 + 0.1 = 0.2$

$P(X_1 = 4) = 0.3 + 0.1 = 0.4$

$P(X_1 = 6) = 0.3 + 0.1 = 0.4$

$P(X_2 = 1) = 0.1 + 0.30 + 0.30 = 0.7$

$P(X_2 = 3) = 0.1 + 0.1 + 0.1 = 0.3$

Media

$E(X_1) = 2 \cdot 0.2 + 4 \cdot 0.4 + 6 \cdot 0.4$

$= 0.4 + 1.6 + 2.4$

$= 4.4$

$E(X_2) = 1 \cdot 0.7 + 3 \cdot 0.3$

$= 1.6$

$$E(X_1^2) = 2^2 \cdot 0.2 + 4^2 \cdot 0.4 + 6^2 \cdot 0.4$$

$$= 0.8 + 6.4 + 14.4$$

$$= 21.6$$

$$E(X_2^2) = 1^2 \cdot 0.70 + 3^2 \cdot 0.30$$

$$= 0.70 + 2.70$$

$$= 3.40$$

$$VAR(x) = E(x)^2 - (Ex)$$

$P(X_1 =) P(X_2 = 1) = 0.2 \cdot 0.7 = 0.14$ FALSE

$P(X_1 =) P(X_2 = 1) = 0.4 \cdot 0.7 = 0.28$ FALSE

$P(X_1 =) P(X_2 =) = 0.2 \cdot 0.3 = 0.06$ FALSE

$P(X_1 =) P(X_2 =) = 0.4 \cdot 0.3 = 0.12$ FALSE

$P(X_1 =) P(X_2 =) = 0.4 \cdot 0.3 = 0.12$ FALSE

NON

$F(x_1, x_2) - [f(x_1) \cdot f(x_2)]$ → misura della loro dipendenza linearizzare

$$Cov = E(X_1, X_2) - [E(X_1) \cdot E(X_2)]$$

→ LEGATO DI PROPORZIONALITÀ IL LORO VARIARE

$$E(X_1, X_2) = \sum X_1 \cdot X_2 \cdot (X_1, X_2)$$

$$E(2,1) = 2 \cdot 1 \cdot 0.1 = 0.2$$
$$E(4,1) = 4 \cdot 1 \quad 0.3 = 1.2$$
$$E(6,1) = 6 \quad 1 \cdot 0.3 = 1.8$$
$$E(2,3) = 2 \cdot 3 \quad 0.1 = 0.6$$
$$E(4,3) = 4 \cdot 3 \quad 0.1 = 1.2$$
$$E(6,3) = 6 \quad 3 \quad 0.1 = 1.8$$

$$E(X_1, X_2) = 0.2 + 1.2 + 1.8 \perp 0.6 + 1.2 + 1.8$$

$$= 6.8$$

$$cov(X_1, X_2) = 6.8 - \qquad (4\ 4.16)$$

$$: -0.24$$

$$\frac{-0.24}{\sqrt{2.24 \cdot 0.84}} = \frac{-0.24}{1.37} = -0.17$$

$-1 \leq \rho \leq 1$

$$+0.1 = 0.2$$

$$3 + 0.1 = 0.4$$

$$3 = 0.3$$

$$P(1) = 0.1 \qquad = 0.1$$

$$= 0.1 \qquad = 0.1$$

$$= 0.3 + 0.1 \qquad = 0.4$$

$$= 0.3 + 0.1 \qquad = 0.4$$

$$P(9) = 0.1 \qquad = 0.1$$