Esercizio 8

sabato 12 giugno 2021 12:09

Ω	X (T)	Y (V)
TT	2	0
CT	1	1
TC	1	1
CC	0	0

1

2

$Y \backslash X$	0	1	2
0	$\frac{1}{4}$	0	$\frac{1}{4}$
1	0	$\frac{1}{2}$	0

$p(X=0) = \frac{1}{4}$

$p(X=1) = \frac{1}{2}$ $\longrightarrow$ $P_X(x) = \begin{cases} \frac{1}{4} & x=0 \\ \frac{1}{2} & x=1 \\ \frac{1}{4} & x=2 \end{cases}$

$p(X=2) = \frac{1}{4}$

$p(Y=0) = \frac{1}{2}$ $\longrightarrow$ $P_Y(y) = \begin{cases} \frac{1}{2} & y=0 \\ \frac{1}{2} & y=1 \end{cases}$

$p(Y=1) = \frac{1}{2}$

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NON INDIPENDENTI

$X \qquad Y \qquad \frac{1}{\ } \cdot \frac{1}{\ } = \frac{1}{8}$

$X \quad Y$

$P(0) \cdot P(0) = \frac{1}{4} \cdot \frac{1}{2} = \frac{1}{8}$

$P(0) \cdot P(1) = \frac{1}{4} \cdot \frac{1}{2} = \frac{1}{8}$

$P(1) \cdot P(0) = \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$

$P(1) \cdot P(1) = \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$

$P(2) \cdot P(0) = \frac{1}{4} \cdot \frac{1}{2} = \frac{1}{8}$

$P(2) \cdot P(1) = \frac{1}{4} \cdot \frac{1}{2} = \frac{1}{8}$

4

MEDIA VARIANZA e COV

$Ex = \frac{1}{4} \cdot 0 + \frac{1}{2} \cdot 1 + \frac{1}{4} \cdot 2$

$$= \frac{1}{2} + \frac{1}{2}$$

$$= 1$$

$$Ey = \frac{1}{2} \cdot 0 + \frac{1}{2} \cdot 1$$

$$= \frac{1}{2}$$

$$Ex^2 = \frac{1}{4} \cdot 0^2 + \frac{1}{2} \cdot 1^2 + \frac{1}{4} \cdot 2^2$$

$$= 0 + \frac{1}{2} + 1$$

$$= \frac{3}{2}$$

$$Ey^2 = \frac{1}{2} \cdot 0^2 + \frac{1}{2} \cdot 1^2$$

$$= \frac{1}{2}$$

$$\mathrm{VAR}\,x = Ex^2 - (Ex)^2 = \frac{3}{2} - (1)^2 = \frac{1}{2}$$

$$\mathrm{VAR}\,y = Ey^2 - (Ey)^2 = \frac{1}{2} - \left(\frac{1}{2}\right)^2 = \frac{1}{2} - \frac{1}{4} = \frac{1}{4}$$

$$\mathrm{Cov}(x\,y) = E(x\,y) - Ex\,Ey$$

$$=$$

$$E(x, y) = \sum x\,y\,(x\,y)$$

$x \quad y$

$F(0,0) = 0$

$f(0,1) = 0$

$f(1,0) = 0$

$f(1,1) = 1 \cdot 1 \; \frac{1}{2} = \frac{1}{2}$

$f(2,0) = 2 \cdot 0 \; \frac{1}{4} = 0$

$f(2,1) = 2 \cdot 1 \cdot 0 = 0$

$$E(x, y) = \frac{1}{2}$$

$$Cov(x y) = E(x y) - E x E y$$

$$= \frac{1}{2} - 1 \cdot \frac{1}{2}$$

$$= 0$$