Econometrics 322

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Joint Probability

Suppose X, Y follows the following joint distribution:

X \ Y	0	1	2
0	**0.1489**	**0.0900**	**0.1253**
1	**0.2034**	**0.0250**	**0.0662**
2	**0.0806**	**0.0799**	**0.1807**

Use this joint distribution to answer the question (1) - (10).

(i) Is this join distribution well defined?

(ii) What is the probability of $X = 2$ and $Y = 2$? (i.e the joint mass function $\boldsymbol{Pr}(X = 2, Y = 2) =?$)

(iii) What is the marginal probability of $X = 0$? (i.e $\boldsymbol{Pr}(X = 0) =?$)

(iv) What is the marginal probability of $Y = 1$? (i.e $\boldsymbol{Pr}(Y = 1) =?$)

(v) What is the probability of $X = 1$ conditioned on Y =1? (i.e $\boldsymbol{Pr}(X = 1|Y = 1) =?$)

(vi) What is the expectation of X? (i.e $\mathbb{E}[X] =?$)

(vii) What is the Variance of Y? (i.e $\text{Var}[Y] =?$)

(viii) What is the conditional expectation of X given $Y = 0$? (i.e (i.e $\mathbb{E}[X|Y = 0] =?$)

(ix) What is the Covariance of X and Y? (i.e $\text{Cov}[X, Y] =?$)

(x) What is the Correlation of X and Y? (i.e $\text{Corr}[X, Y] =?$)