Statistics and Probability

Discrete Random Variables

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Discrete Random Variables

Consider the random variables X and Y. X takes the values 0,1 and 2. Y takes the values 0 and 1. The joint probabilities for each pair are given by the following table.

	$X = 0$	$X = 1$	$X = 2$
$Y = 0$	0.1	0.4	0.1
$Y = 1$	0.1	0.1	0.2

- Compute the expected values of X and Y.
- Compute the $E(X|Y = 1)$

Compute $E(X)$ and $E(Y)$.

First compute the marginal distributions.

	$X = 0$	$X = 1$	$X = 2$	
$Y = 0$	0.1	0.4	0.1	
$Y = 1$	0.1	0.1	0.2	

Compute $E(X)$ and $E(Y)$.

First compute the marginal distributions.

	$X = 0$	$X = 1$	$X = 2$	
$Y = 0$	0.1	0.4	0.1	0.6
$Y = 1$	0.1	0.1	0.2	0.4
	0.2	0.5	0.3	

Compute $E(X)$

x_i	0	1	2
$p(x_i)$	0.20	0.50	0.30

$$E(X) = \sum x_i \cdot p(x_i)$$

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$$E(X) = (0 \times 0.2) + (1 \times 0.5) + (2 \times 0.3) = 1.1$$