
CSCI 21013 Statistical Inference (2022/2023)

Tutorial #02

1. Consider a sample of size 2 drawn without replacement from an urn containing three balls, numbered 1, 2, and 3. Let X be the smaller of the two numbers drawn and Y the larger.
 - a. Find the joint distribution function of X and Y .
 - b. Find $P[X \geq 1, Y \geq 2]$.
 - c. Find the mean and variance of X and Y .
 - d. Find the correlation coefficient of X and Y .

2. Consider the two random variables X and Y with joint PMF given in the following table.

	$Y = 0$	$Y = 1$	$Y = 2$
$X = 0$	1/6	1/4	1/8
$X = 1$	1/8	1/6	1/6

- a. Find $(X = 0, Y \leq 1)$.
- b. Find $(X = 1, Y \leq 1)$.
- c. Find $(X \leq 0, Y \leq 1)$.
- d. Find $(X \leq 1.5, Y \leq 1.5)$.
- e. Find the marginal density functions of X and Y .
- f. Find $E(X)$, $E(Y)$, $E(XY)$
- g. Find the correlation coefficient of X and Y .