

# Assignment 3

## AI1110 Probability and Random Variables

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**Question 12.13.4.2:** An urn contains 5 red and 2 black balls. Two balls are randomly drawn. Let  $X$  represent the number of black balls. What are the possible values of  $X$ ? Is  $X$  a random variable ?

**Solution:**

The sample space of the experiment is  $S=\{RR, RB, BR, BB\}$ .

$X$  denotes the number of black balls.

$X$  is a number whose values are defined on the outcomes of a random experiment. Therefore,  $X$  is a random variable.

For each outcome, its value is,

$$X(RR) = 0 \quad (1)$$

$$X(RB) = 1 \quad (2)$$

$$X(BR) = 1 \quad (3)$$

$$X(BB) = 2 \quad (4)$$

Therefore  $X=\{0,1,2\}$