Assignment 1

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Problem 10.15.1.8:-

A bag contains 3 red balls and 5 black balls. A ball is drawn at random from the bag. What is the probability that the ball drawn is (i) red ? (ii) not red?

Solution:-

Number of red balls in the bag = 3
Number of black balls in the bag = 5
Total number of balls in the bag = 3 + 5 = 8

Let X be a Bernoulli random variable, such that $X \sim Ber(p)$.

$$X = \begin{cases} 1 & \text{if drawn ball is red} \\ 0 & \text{otherwise.} \end{cases} \tag{1}$$

(i) Probability that the drawn ball is red

$$= \Pr(X = 1) \tag{2}$$

$$= \frac{Number\ of\ red\ balls}{Total\ number\ of\ balls} = \boxed{\frac{3}{8}} \tag{3}$$

$$\implies p = \frac{3}{8} \tag{4}$$

(ii) Probability that the drawn ball is not red

$$= \Pr(X = 0) \tag{5}$$

$$= 1 - p = 1 - \frac{3}{8} = \boxed{\frac{5}{8}} \tag{6}$$