AI1103-Assignment 1

Name: Vanga Aravind Shounik, Roll Number: CS20BTECH11055

Download all python codes from

https://github.com/AravindShounik/AI1103/blob/main/Assignment−1/Codes/assignment−1.py

and latex-tikz codes from

https://github.com/AravindShounik/AI1103/blob/main/Assignment−1/assignment−1.tex

Question 5.2

A bag contains 3 red and 5 black balls. A ball is drawn at random from the bag. What is the probability that the ball drawn is

1) red?
2) not red?

Solution

Total number of marbles = 3 + 5 = 8 marbles
Let $X \in \{0, 1\}$ represent the random variable, where 0 represents a red marble, 1 represents a black marble. From the given information,

1) Probability that the ball taken out will be red $= \Pr(X = 0)$

$$\Pr(X = 0) = \frac{\text{number of red balls}}{\text{total number of balls}} \tag{0.0.1}$$

$$\Pr(X = 0) = \frac{3}{8} = 0.375 \tag{0.0.2}$$

2) Probability that the marble taken out will not be red $= \Pr(X = 1)$
Because the complementary of $\Pr(X = 0)$ is $\Pr(X = 1)$
We know that the sum of probabilities of every random variable is 1. So,

$$\Pr(X = 1) + \Pr(X = 0) = 1 \tag{0.0.3}$$

$$\implies \Pr(X = 1) = 1 - \Pr(X = 0) \tag{0.0.4}$$

$$= 1 - 0.375 \tag{0.0.5}$$

$$= 0.625 \tag{0.0.6}$$

$$\implies \Pr(X = 1) = 1 - 0.375 = 0.625 \tag{0.0.7}$$