

AI1103-Assignment 1

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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
 $= \Pr(X = 0)$

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

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

- 2) Probability that the marble taken out will not be red $= \Pr(X \neq 0)$

We know that complementary events are mutually exclusive. So,

$$\Pr(X \neq 0) + \Pr(X = 0) = 1 \quad (0.0.3)$$

$$\implies \Pr(X \neq 0) = 1 - \Pr(X = 0) \quad (0.0.4)$$

$$= 1 - 0.375 \quad (0.0.5)$$

$$= 0.625 \quad (0.0.6)$$

$$\implies \Pr(X \neq 0) = 1 - 0.375 = 0.625 \quad (0.0.7)$$