

AI1103 ASSIGNMENT 1

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Download the python code from

<https://github.com/sarandeepmannam/AI1103Assignment1/blob/main/Assignment1.py>

and latex-tikz code from

<https://github.com/sarandeepmannam/AI1103Assignment1/blob/main/Assignment1.tex>

1 PROBLEM-2.16

An urn contains 10 black and 5 white balls. Two balls are drawn from the urn one after the other without replacement. What is the probability that both balls are black?

2 SOLUTION-2.16

Let's take two events A and B.

A: The first ball is black

B: The second ball is black

We are required to find the probability of both the first and second balls to be black.

The required probability is $P(A \cap B)$.

The probability of taking first ball as black will be,

$$P(A) = \frac{10}{15} = \frac{2}{3} \quad (2.0.1)$$

The probability of event B to be true given A is true (taking a black ball from 9 black and 5 white balls containing urn) will be,

$$P(B|A) = \frac{9}{14} \quad (2.0.2)$$

By the definition of conditional probability,

$$P(B|A) = \frac{P(A \cap B)}{P(A)} \quad (2.0.3)$$

$$\implies P(A \cap B) = P(A) \times P(B|A) \quad (2.0.4)$$

$$\implies P(A \cap B) = \frac{3}{7} = 0.428571428571.. \quad (2.0.5)$$

Hence, the required probability is 0.428571