

AI1103-Assignment 3

Name: Vanga Aravind Shounik, Roll Number: CS20BTECH11055

Download all python codes from

<https://github.com/AravindShounik/AI1103/blob/main/Assignment-3/Codes/assignment-3.py>

and latex-tikz codes from

<https://github.com/AravindShounik/AI1103/blob/main/Assignment-3/assignment-3.tex>

QUESTION GATE 2021 (MA) Q.8 (APTL. SECTION)

There are five bags each containing identical sets of ten distinct chocolates. One chocolate is picked from each bag.

The probability that at least two chocolates are identical is

SOLUTION

Let $X \in \{0, 1, 2, 3, 4, 5\}$ represent the random variable, denoting the number of similar chocolates in the picked chocolates

Here, we can neglect $X=1$ because there can't be one similar object.

$$\Pr(X \geq 2) + \Pr(X = 0) = 1 \quad (0.0.1)$$

$$\Pr(X = 0) = \frac{10 \cdot 9 \cdot 8 \cdot 7 \cdot 6}{10^5} \quad (0.0.2)$$

$$\Pr(X = 0) = 0.3024 \quad (0.0.3)$$

$$\Pr(X \geq 2) = 1 - \Pr(X = 0) \quad (0.0.4)$$

$$= 1 - 0.3024 \quad (0.0.5)$$

$$= 0.6976 \quad (0.0.6)$$