Assignment 2

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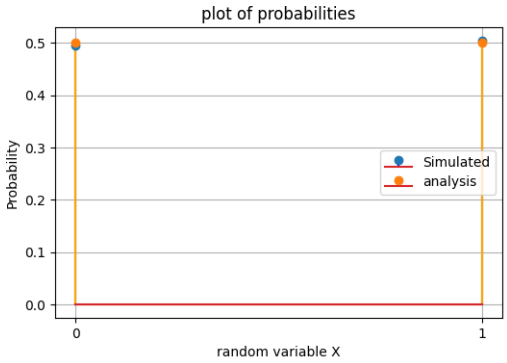
Download all python codes from

https://github.com/Adarsh541/AI1103−prob−and−ranvar/blob/main/Assignment2/codes/Assignment2.py

and latex-tikz codes from

https://github.com/Adarsh541/AI1103−prob−and−ranvar/blob/main/Assignment2/Assignment2.tex



1 Problem(GATE 1)

A urn contains 5 red balls and 5 black balls.In the first draw, one ball is picked at random and discarded without noticing its colour.The probability to get a red ball in the second draw is

(A) $\frac{1}{2}$ (B) $\frac{4}{9}$ (C) $\frac{5}{9}$ (D) $\frac{6}{9}$

2 solution(GATE1)

Let $X_i \in \{0, 1\}$ represent the i^{th} draw where 1 denotes a red ball is drawn.

TABLE 4

	$X_1 = 0$	$X_1 = 1$
$X_2 = 0$	4/18	5/18
$X_2 = 1$	5/18	4/18

Table 4 represents the probabilities of all possible cases when two balls are drawn one by one from the urn.

$$\Pr(X_2 = 1) = \Pr(X_2 = 1|X_1 = 0) + \Pr(X_2 = 1|X_1 = 1) \tag{2.0.1}$$

$$= \frac{5}{18} + \frac{4}{18} \tag{2.0.2}$$

$$= \frac{1}{2} \tag{2.0.3}$$

The required option is (A).