Assignment 2

Ananthoju Pranav Sai - AI20BTECH11004

Download all python codes from

and latex codes from

PROBLEM(5.22)

There are 40 students in class X of whom 25 are girls and 15 are boys. The class teacher has to select one student as a class representative. He writes the name of each student on a separate card, the cards being identical. Then she puts cards in a bag and stirs them thoroughly. She then draws one card from the bag. What is the probability that the name written on the card is the name of
(i) a girl?
(ii) a boy?

SOLUTION(5.22)

Given, total number of students in class X = 40
Number of girls in class X = 25
Number of boys in class X = 15
As each students name is written on a separate card
Total number of cards=Total number of students=40
Let the random variable X = {0,1} represent the outcome whether the picked card has a girl's name or a boy's name.

Case	X	n(X)
Girl	0	25
Boy	1	15

We know that the probability of event E of the sample space S is given by

$$\Pr(E) = \frac{n(E)}{n(S)} \tag{5.22.1}$$

As total number of students = 40

$$n(S) = 40 \tag{5.22.2}$$

$$\Pr(X = 0) = \frac{n(X = 0)}{n(S)} \tag{5.22.3}$$

$$\implies \Pr(X = 0) = \frac{25}{40} \tag{5.22.4}$$

$$\implies \Pr(X = 0) = 0.625 \tag{5.22.5}$$

$$\Pr(X = 1) = \frac{n(X = 1)}{n(S)} \tag{5.22.6}$$

$$\implies \Pr(X = 1) = \frac{15}{40} \tag{5.22.7}$$

$$\implies \Pr(X = 1) = 0.375 \tag{5.22.8}$$

Theoretical v/s Simulated probabilities :