Assignment 2

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https://github.com/96143/Assignment−2/blob/main/question%201.1.ipynb
https://github.com/96143/Assignment−2/blob/main/question%201.2.ipynb

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https://github.com/96143/Assignment−2/blob/main/1.1

1 Problem 1.1

A jar contains 24 marbles, some are green and others are blue. If a marble is drawn at random from the jar, the probability that it is green is $\frac{2}{3}$. Find the number of blue marbles in the jar.

2 Solution 1.1

Let X be the random variable that denotes whether the drawn marble is blue or green
We know,
Bernoulli Distribution

$$P(x) = \begin{cases} p^x(1-p)^{1-x} & x = 0, 1; p+q = 1 \\ 0 \end{cases} \tag{2.0.1}$$

In Bernoulli Distribution
Mean -

$$\Sigma x = \mu_1^1 = p \tag{2.0.2}$$

We have probability of green marbles is $\frac{2}{3}$ i.e. Mean = $p = \frac{2}{3}$

$$\therefore \frac{\Sigma x}{N} = \frac{2}{3} \tag{2.0.3}$$

$$\frac{\Sigma x}{24} = \frac{2}{3} \tag{2.0.4}$$

$$\therefore \Sigma x = 16 \tag{2.0.5}$$

No of Green Marbles is 16
such that we have total marbles = 24
Therefore, blue marbles = 24 - 16 = 8 Marbles

3 Problem 1.2

A bag contains lemon flavoured candies only. Malini takes out one candy without looking into the bag. What is the probability that she takes out ?

1) an orange flavoured candy?
2) a lemon flavoured candy?

4 Solution 1.2

1) Probability of taking lemon flavoured candy = $P(L)$
   Probability of taking orange flavoured candy = $P(O)$
   The bag contains only lemon flavored candies, and nothing else. Therefore,

$$P(O) = P(X = 1) = 0 \tag{4.0.1}$$

   The probability of taking out an orange flavored candy = 0

2) The bag only contains lemon flavored candies. Therefore,

$$P(L) = P(X = 0) = 1 \tag{4.0.2}$$

   Therefore, the probability of taking out a lemon flavored candy = 1