ASSIGNMENT-2

B PREMSAGAR - EE22BTECH11013

Question XH-3.2023: Given a fair six-faced dice where the faces are labelled '1','2','3','4','5', and '6'. what is the probability of getting a '1'on the first roll of the dice and a '4' on the second roll ?
Solution: Let X_1 and X_2 be an bernoulli rv's defined as,

TABLE 0
DECLARATION OF RV'S

Parameter	value	Description
X_1	1	getting 1 in 1st throw
	0	not getting 1 in 1st throw
X_2	1	getting 4 in 2nd throw
	0	not getting 4 in 2nd throw

The probabbility follows:

$$p_{X_1}(k) = \begin{cases} \frac{1}{6}, & \text{k} = 1 \\ \\ \frac{5}{6}, & \text{k} = 0 \end{cases} \tag{1}$$

$$p_{X_2}(k) = \begin{cases} \frac{1}{6}, & \text{k} = 1 \\ \\ \frac{5}{6}, & \text{k} = 0 \end{cases} \tag{2}$$

Now,

$$\begin{aligned} \Pr(X_1 = 1, X_2 = 1) &= \Pr(X_1 = 1)\Pr(X_2 = 1) && (3)\\ &= \Pr(1)\Pr(1) && (4)\\ &= \frac{1}{6} \cdot \frac{1}{6} && (5)\\ &= \frac{1}{36} && (6)\\ &= 0.028 && (7) \end{aligned}$$

Hence, probability of getting a '1'on the first roll of the dice and a '4' on the second roll is 0.028