Assignment 1

AI1110 : Probability And Random Variables

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Question: A die is thrown three times,

E : 4 appears on the third toss,
F : 6 and 5 appears respectively
on first two tosses

Solution: A fair dice is tossed thrice.

There are three differnt ordered outcome each with values from 1 to 6 with equal probability.

Let X be a random variable which takes the values 1 , 2 , 3 , 4 , 5 and 6.

P_1, P_2 and $P_3$are probablities
connected to respective three dice rolls.

A fair die gives equal (1/6) probability for any X . S being the set of the sample space.

$$X = \{1, 2, 3, 4, 5, 6\} \tag{1}$$

$$P(E) = P_1(S) \cdot P_2(S) \cdot P_3(X = 4)/ \tag{2}$$

$$\therefore P(E) = 1 \cdot 1 \cdot (1/6) \tag{3}$$

$$P(F) = P_1(X = 6) \cdot P_2(X = 5) \cdot P_3(S) \tag{4}$$

$$\therefore P(F) = (1/6) \cdot (1/6) \cdot 1 \tag{5}$$

$$= (1/36) \tag{6}$$

So, probability of
E : 4 appears on the third toss is : 1/6 or 0.167 or 16.7%

F : 6 and 5 appears respectively on first two tosses is : 1/36 or 0.0278 or 2.78%