Assignment 1

Sujal - AI20BTECH11020

Download all python codes from

and latex codes from

1 PROBLEM

A die is thrown. If E is the event "the number appearing is a multiple of 3" and F be the event "the number appearing is even" then find whether E and F are independent ?

2 SOLUTION

Two event A and B are independent if

$$P(A \cap B) = P(A) \cdot P(B)$$

A die is thrown.
We know that the sample space is

$$\mathbf{S} = (1, 2, 3, 4, 5, 6)$$

Let two events be
A: the number appear is a multiple of 3 .
B: the number appearing is even.

$$A : (3, 6)$$

$$\mathbf{Pr(A)} = \frac{2}{6} = \frac{1}{3}$$

$$B : (2, 4, 6)$$

$$\mathbf{Pr(B)} = \frac{3}{6} = \frac{1}{2}$$

$A \cap B$ =the number appearing is even multiple of 3 = (3)
So,

$$\mathbf{Pr(A \cap B)} = \frac{1}{6}$$

Now,

$$\mathbf{Pr(A)} \cdot \mathbf{Pr(B)} = \frac{1}{3} \cdot \frac{1}{2} = \frac{1}{6}$$

Since,

$$\mathbf{Pr(A \cap B)} = \mathbf{Pr(A)} \cdot \mathbf{Pr(B)}$$

Therefore A and B are independent events.