

Assignment-2

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Abstract—This document illustrates the distance of the point from the point of intersection of the line and the plain.

Download all python codes from

<https://github.com/upender20/EE5600/tree/master>

1 PROBLEM

An unbiased die is thrown twice. Let the event A be "odd number on the first throw" and B the event "odd number on the second throw". Check the independence of the events A and B .

2 SOLUTION

Two events A & B are independent if

$$P(A \cap B) = P(A).P(B) \quad (2.0.1)$$

An unbiased die is thrown twice

$$S = \begin{bmatrix} (1,1) (1,2) (1,3) (1,4) (1,5) (1,6) \\ (2,1) (2,2) (2,3) (2,4) (2,5) (2,6) \\ (3,1) (3,2) (3,3) (3,4) (3,5) (3,6) \\ (4,1) (4,2) (4,3) (4,4) (4,5) (4,6) \\ (5,1) (5,2) (5,3) (5,4) (5,5) (5,6) \\ (6,1) (6,2) (6,3) (6,4) (6,5) (6,6) \end{bmatrix} \quad (2.0.2)$$

Number of elements (outcomes) of the above example space is $6 \times 6 = 36$

A : Odd number on First throw

$$P(A) = \frac{18}{36} = \frac{1}{2} \quad (2.0.3)$$

B : Odd number on Second throw

$$P(B) = \frac{18}{36} = \frac{1}{2} \quad (2.0.4)$$

$A \cap B$ = Odd number on the First & Second throw

$$= (1, 1), (1, 3), (1, 5), (3, 1), (3, 3), (3, 5), (5, 1), (5, 3), (5, 5) \quad (2.0.5)$$

So,

$$P(A \cap B) = \frac{9}{36} = \frac{1}{4} \quad (2.0.6)$$

Now , From (2.0.3) and (2.0.4)

$$P(A).P(B) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4} \quad (2.0.7)$$

From (2.0.6) and (2.0.7) we get,

$$P(A \cap B) = P(A).P(B) \quad (2.0.8)$$

Hence, Two events A & B are independent events.