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_Assignment−2

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

$$P(A \cap B) = P(A).P(B) \tag{2.0.1}$$

An unbiased die is thrown twice

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

Number of elements (outcomes) of the above example space is 6×6 = 36

A : Odd number on First throw

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

B : Odd number on Second throw

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

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

$$= (1,1), (1,3), (1,5), (3,1), (3,3), (3,5), (5,1), (5,3), (5,5) \tag{2.0.5}$$

So,

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

Now , From (2.0.3) and (2.0.4)

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

From (2.0.6) and (2.0.7) we get,

$$P(A \cap B) = P(A).P(B) \tag{2.0.8}$$

Hence,Two events A&B are independent events.