Assignment 5-Probability and Random Variable

Annu-EE21RESCH01010

Download latex code from here-

https://github.com/annu100/AI5002−Probability−and−Random−variables/tree/main/ASSIGNMENT_5

download python code from here

https://github.com/annu100/AI5002−Probability−and−Random−variables/blob/main/ASSIGNMENT_5/assignment_5.py

I. Problem Statement-Problem 4.10

Two dice, one blue and one grey, are thrown at the same time.

1) Complete Table 4.1.1.

2	$\frac{1}{36}$
3	—
4	—
5	—
6	—
7	–
8	$\frac{5}{36}$
9	—
10	—
11	—
12	$\frac{1}{36}$

2) A student argues that there are 11 possible outcomes 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12. Therefore, each of them has a probability 1 11 . Do you agree with this argument? Justify your answer.

II. Solutions

Since we know ,the possible outcomes when a pair of two dices are thrown. Therefore,In a throw of pair of dice, blue and grey, total no of possible outcomes=36(6×6) which are [(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)]

$E_2 \rightarrow$ event of getting sum as 2
No. of favorable outcomes =1 (i.e.,(1,1))

P(E_2)=$\frac{1}{36}$

$E_3 \rightarrow$ event of getting sum as 3

No. of favorable outcomes =2 (i.e.,(1,2)(2,1))

P(E_3)=$\frac{2}{36}$
$E_4 \rightarrow$ event of getting sum as 4

No. of favorable outcomes =3 (i.e.,(3,1)(2,2)(1,3))

P(E_2)=$\frac{3}{36}$
$E_5 \rightarrow$ event of getting sum as 5

No. of favorable outcomes =4 (i.e.,(1,4)(2,3)(3,2)(4,1))

P(E_5)=$\frac{4}{36}$
$E_6 \rightarrow$ event of getting sum as 6

No. of favorable outcomes =5(i.e.,(1,5)(2,4)(3,3)(4,2)(5,1))

P(E_6)=$\frac{5}{36}$

$E_7 \rightarrow$ event of getting sum as 7

Table I: Caption

No. of favorable outcomes =6 (i.e.,(1,6)(2,5)(3,4)(4,3)(5,2)(6,1))

P(E_7)=$\frac{6}{36}$

$E_8 \rightarrow$ event of getting sum as 8

No. of favorable outcomes =5 (i.e.,(2,6)(3,5)(4,4)(5,3)(6,2))

P(E_8)=$\frac{6}{36}$

$E_9 \rightarrow$ event of getting sum as 9

No. of favorable outcomes =4 (i.e.,(3,6)(4,5)(5,4)(6,3))

P(E_9)=$\frac{4}{36}$

$E_10 \rightarrow$ event of getting sum as 10

No. of favorable outcomes =3 (i.e.,(4,6)(5,5)(6,4))

P(E_10)=$\frac{3}{36}$

$E_11 \rightarrow$ event of getting sum as 11

No. of favorable outcomes =2,(i.e.,(6,5)(5,6))

P(E_11)=$\frac{2}{36}$

$E_12 \rightarrow$ event of getting sum as 12

No. of favorable outcomes =1,(i.e.,(6,6))

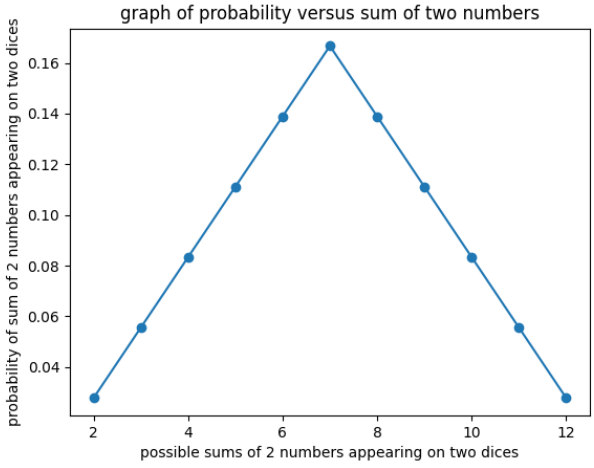
P(E_12)=$\frac{1}{36}$

From the figure(table) we can see that the outcomes are not equally likely - we see that, there is different probability for different outcome.
Hence,not agreed with the argument completely.
Complete Table 4.1.1.

Table II: **Possible sum of 2 nos on 2 dice and their probability**

2	$\frac{1}{36}$
3	$\frac{2}{36}$
4	$\frac{3}{36}$
5	$\frac{4}{36}$
6	$\frac{5}{36}$
7	$\frac{6}{36}$
8	$\frac{5}{36}$
9	$\frac{4}{36}$
10	$\frac{3}{36}$
11	$\frac{2}{36}$
12	$\frac{1}{36}$

Figure 1: grapgh for probability of sum of 2 numbers on 2 dice



Above is is the graph of probability for getting sum of two numbers appearing on 2 dices versus possible sums