Assignment 1

AI5030: Probability and Random Variables
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10.13.3.20: Question. Two dice are thrown simultaneously. What is the probability that the sum of thenumbers appearing on the dice is

(i) 7?
(ii) a prime number?
(iii) one?

Solutions:

(i) 7?

when two dice are thrown, There are 36 possible outcomes in total. To get a sum of 7, there are 6 possible outcomes:

(1,6), (2,5), (3,4), (4,3), (5,2), (6,1).

$$\Pr(sum = 7) = \frac{1}{6} \tag{1}$$

(ii) a prime number?

To get a prime number as the sum of two dice, we need to consider the following outcomes:

(1,2), (1,4), (2,1), (2,3), (2,5), (3,2), (3,4), (4,1), (4,3), (4,5), (5,2), (5,4), (6,1), (6,5).

There are 14 such outcomes, so

$$\Pr(primenumber) = \frac{7}{18} \tag{2}$$

(iii) one?

To get a sum of 1, the only possible outcome is (1,0),(0,1) which are not a valid outcome as the numbers on a die range from 1 to 6.

Therefore, the probability of getting a sum of 1 is
$\Pr(sum = 1) = 0$