AI5030 - Probability Assignment 1

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Question 10.13.3.23
Two dice are numbered 1, 2, 3, 4, 5, 6 and 1, 1, 2, 2, 3, 3, respectively. They are thrown and the sum of the numbers on them is noted. Find the probability of getting each sum from 2 to 9 separately

Solution:

When these two dice are rolled out the elements in the sample space are S=(1, 1), (1, 1)...(6, 2), (6, 3), (6, 3). The total number of elements in this sample space is $n(S) = 36$.

Let $\boldsymbol{E_1}$ be the event that the probability of getting sum is 2. The elements corresponding to the above event (1,1), (1,1)
n(E_1)=2

$$\boldsymbol{P(E_1) = \frac{2}{36} = \frac{1}{18}}$$

Let $\boldsymbol{E_2}$ be the event that the probability of getting sum is 3. The elements corresponding to the above event (1,2), (1,2), (2,1), (2,1)
n($\boldsymbol{E_2}$)=4

$$\boldsymbol{P(E_2) = \frac{4}{36} = \frac{1}{9}}$$

Let $\boldsymbol{E_3}$ be the event that the probability of getting sum is 4. The elements corresponding to the above event (1,3), (1,3), (2,2), (2,2), (3,1), (3,1)
n($\boldsymbol{E_3}$)=6

$$\boldsymbol{P(E_3) = \frac{6}{36} = \frac{1}{6}}$$

Let $\boldsymbol{E_4}$ be the event that the probability of getting sum is 5. The elements corresponding to the above event (2,3), (2,3), (3,2), (3,2), (4,1), (4,1)
n($\boldsymbol{E_4}$)=6

$$\boldsymbol{P(E_4) = \frac{6}{36} = \frac{1}{6}}$$

Let $\boldsymbol{E_5}$ be the event that the probability of getting sum is 6. The elements corresponding to the above event (3,3), (3,3), (4,2), (4,2), (5,1), (5,1)
n($\boldsymbol{E_5}$)=6

$$\boldsymbol{P(E_5) = \frac{6}{36} = \frac{1}{6}}$$

Let $\boldsymbol{E_6}$ be the event that the probability of getting sum is 7. The elements corresponding to the above event (4,3), (4,3), (5,2), (5,2), (6,1), (6,1)
n($\boldsymbol{E_6}$)=6

$$\boldsymbol{P(E_6) = \frac{6}{36} = \frac{1}{6}}$$

Let $\boldsymbol{E_7}$ be the event that the probability of getting sum is 8. The elements corresponding to the above event (5,3), (5,3), (6,2), (6,2)
n($\boldsymbol{E_7}$)=4

$$\boldsymbol{P(E_7) = \frac{4}{36} = \frac{1}{9}}$$

Let $\boldsymbol{E_8}$ be the event that the probability of getting sum is 9. The elements corresponding to the above event (6,3), (6,3)
n($\boldsymbol{E_8}$)=2

$$\boldsymbol{P(E_8) = \frac{2}{36} = \frac{1}{18}}$$

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