

Probability Assignment -I

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Question:

Two dice are thrown at the same time. Find the probability of getting

- 1) same number on both dice.
- 2) different numbers on both dice.

$$\Pr(A) = \frac{6}{36}$$

$$\Pr(A) = \frac{1}{6}$$

(2)

Solution:

(1)

Let S represents the total sample space when two dice are rolled

Then

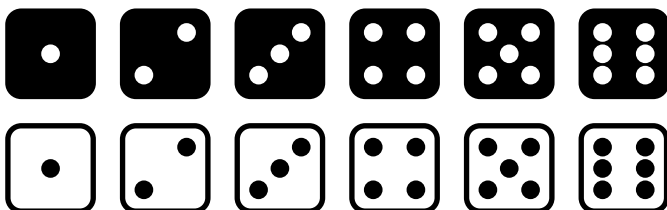
$$S = \left\{ \begin{array}{cccccc} (1, 1) & (1, 2) & (1, 3) & (1, 4) & (1, 5) & (1, 6) \\ (2, 1) & (2, 2) & (2, 3) & (2, 4) & (2, 5) & (2, 6) \\ (3, 1) & (3, 2) & (3, 3) & (3, 4) & (3, 5) & (3, 6) \\ (4, 1) & (4, 2) & (4, 3) & (4, 4) & (4, 5) & (4, 6) \\ (5, 1) & (5, 2) & (5, 3) & (5, 4) & (5, 5) & (5, 6) \\ (6, 1) & (6, 2) & (6, 3) & (6, 4) & (6, 5) & (6, 6) \end{array} \right\}$$

There are total 36 possible outcomes when two dice are rolled and altogether represents the sample space

Let A be the event that represents getting same number on both the dice

$$A \in \{(1, 1), (2, 2), (3, 3), (4, 4), (5, 5), (6, 6)\}$$

There are total 6 possible outcomes that all together represents the event A



From the above analysis we got to know that the probability of getting same number as

$$\Pr(A) = \frac{1}{6}$$

Let define B is an event of getting different number on both the dice when they are rolled

Events A and B are mutually exclusive

As we defined only two events on whole sample space and they are mutually exclusive :

$$A \cap B = \emptyset$$

$$\Pr(A \cap B) = 0$$

$$\therefore \Pr(A \cup B) = \Pr(A) + \Pr(B)$$

$$\Pr(A) + \Pr(B) = 1$$

$$\Pr(B) = 1 - \Pr(A)$$

$$\Pr(B) = 1 - \frac{1}{6}$$

$$\Pr(B) = \frac{5}{6}$$

Probability of Dice Outcomes

let X be the Random Variable of getting same number when both dice are rolled

let Y be the Random Variable of getting different number when both dice are rolled

Parameter	Value	Description
$\Pr(X)$	$\frac{1}{6}$	The probability of getting the same number on both dice.
$\Pr(Y)$	$\frac{5}{6}$	The probability of getting different numbers on both dice.