

Probability Assignment 2

EE22BTECH11209 - GUMMAPU SATHWIK PREETHAM*

Question : A card is selected from a pack of 52 cards.

- (a) How many points are there in the sample space?
- (b) Calculate the probability that the card is an ace of spades.
- (c) Calculate the probability that the card is
 - (i) an ace
 - (ii) black card.

Solution : Let S be the sample space S where $n(S) = 52$

- (a) When a card is selected from a pack of 52 cards, the number of possible outcomes is 52. So the sample space contains 52 elements.

\therefore there are 52 points in sample space. (1)

- (b) Let A be the event in which the card drawn is an ace of spades
so $n(A) = 1$

$$\Pr A = \frac{n(A)}{n(S)} = \frac{1}{52} \quad (2)$$

- (c)(i) Let B be an event in which card drawn is an ace.
As there are 4 aces in a pack of 52 cards
 $n(B) = 4$.

$$\Pr B = \frac{n(B)}{n(S)} = \frac{4}{52} = \frac{1}{13} \quad (3)$$

- (ii) Let C be the event in which card drawn is black.
As there are 26 black cards in a pack of 52 cards
 $n(C) = 26$

$$\Pr C = \frac{n(C)}{n(S)} = \frac{26}{52} = \frac{1}{2} \quad (4)$$

Table:

Parameter	Value	Description
Number of cards	52	The number of points in sample space is 52
Ace of spades	1	Event in which card drawn is an ace of spades
Ace	4	Event in which card is an ace
Black card	26	Event in which card drawn is black