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

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

(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.

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

(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

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

Table:

Parameter	Value	Description
S	52	The number of points in sample space is 52
A	1	Event in which card drawn is an ace of spades
B	4	Event in which card is an ace of spades
C	26	Event in which card drawn is black