

AI1110: Probability and Random Variable

Assignment-2

Saksham*
AI22BTECH11024

Question: 11.16.3.4

Problem Statement:

A card is selected from a pack of 52 cards.

- 1) How many points are there in the sample space?
- 2) Calculate the probability that the card is an ace of spades.
- 3) Calculate the probability that the card is
 - a) an ace
 - b) a black card

Solution:

It is given that there are 52 cards in the deck,

- 1) Number of points in the sample space = 52 (given)
 $n(S) = 52$
- 2) Let us assume 'A' be the event of drawing an ace of spades.

$$A = 1 \quad (1)$$

$$\Rightarrow n(A) = 1 \quad (2)$$

$$\Pr(A) = n(A)/n(S) = 1/52 \quad (3)$$

$$(4)$$

- 3) a) Let us assume 'B' be the event of drawing an ace. There are four aces.

$$\Rightarrow n(B) = 4 \quad (5)$$

$$\Pr(B) = n(B)/n(S) \quad (6)$$

$$= 4/52 \quad (7)$$

$$= 1/13 \quad (8)$$

$$(9)$$

- b) Let us assume 'C' be the event of drawing a black card. There are 26 black cards.

$$n(C) = 26 \quad (10)$$

$$\Pr(C) = n(C)/n(S) \quad (11)$$

$$= 26/52 \quad (12)$$

$$= 1/2 \quad (13)$$

$$(14)$$