Assignment 1

AI1110: Probability and Random Variables

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11.16.3.4: 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 and (ii) black card.

Solution:Given a pack of 52 cards,

Let A , B and C are events when given card is an ace , spade and black card respectively such that $\Pr(A) = 1/13$, $\Pr(B) = 1/4$, $\Pr(C) = 1/2$. A and B are independent events.

(a) No.of points in sample space

$$Number\ \ of\ \ points\ \ in\ \ sample\ \ space = \ \ 52(given) \tag{1}$$

(b) The probability when the card selected is ace of spades

$$\Pr(AB) = \Pr(A) * \Pr(B) \tag{2}$$

$$= \frac{1}{13} * \frac{1}{4} \tag{3}$$

$$= \frac{1}{52} \tag{4}$$

(c) The probability when the card selected is (i) an ace and (ii) black card

$$\Pr(A) = \frac{1}{13} \tag{5}$$

$$\Pr(C) = \frac{1}{2} \tag{6}$$