

# 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:**

S is a sample space of given cards ,

TABLE 3  
EVENT AND PROBABILITY TABLE

| Event | card choosen is | Probability |
|-------|-----------------|-------------|
| A     | an ace          | 1/13        |
| B     | spade           | 13/52       |
| C     | black card      | 26/52       |

- (a) Since no.of cards in the pack is 52 ,

$$n(S) = 52. \quad (1)$$

- (b) The probability when the card choosen is an ace of spades ,

$$\Pr(AB) = \Pr(A)\Pr(B) \quad (2)$$

$$= \left(\frac{1}{13}\right)\left(\frac{1}{4}\right) \quad (3)$$

$$= \frac{1}{52}. \quad (4)$$

- (c) The probability when the card choosen is ,

- (a) an ace

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

- (b) black card

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