Assignment-1
AI1110: Probability and Random Variables
Indian Institute of Technology, Hyderabad

P. Satvik

EE22BTECH11212

Question:
One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting (i) a king of red colour (ii) a face card (iii) a red face card (iv) the jack of hearts (v) a spade (vi) the queen of diamonds

Solution:

(i) Probability of drawing a King of Red colour
Since there are two Suits of colour Red and each Suit has a King each,
No. of Red Kings = 2 = K_r (say)
Total No. of cards in a deck = 52 = N(say)

$$Probability = \frac{K_r}{N} = \frac{2}{52} = \frac{1}{26} \qquad (1)$$

(ii) Probability of drawing a Face Card
Since each suit has 3 face cards and there are 4 suits,
No. of Face Cards = $3 * 4 = 12 = F$ (say)

$$Probability = \frac{F}{N} = \frac{12}{52} = \frac{3}{13} \qquad (2)$$

(iii) Probability of drawing a Red Face Card
As there are only two red suits,
No. of Red Face Cards = $2 * 3 = 6 = R_f$ (say)

$$Probability = \frac{R_f}{N} = \frac{6}{52} = \frac{3}{26} \qquad (3)$$

(iv) Probability of drawing the Jack of Hearts
No. of Jack of Hearts = 1 = J_h

$$Probability = \frac{J_h}{N} = \frac{1}{52} \qquad (4)$$

(v) Probability of drawing a spade

No. of spades = 13 = s (say)

$$Probability = \frac{s}{N} = \frac{13}{52} = \frac{1}{4} \qquad (5)$$

(vi) Probability of drawing Queen of Diamonds
No. of Queen of Diamonds = 1 = Q_d

$$Probability = \frac{Q_d}{N} = \frac{1}{52} \qquad (6)$$