

Lab-2 Questions and Answers

Try to solve for these

1. If you have a shuffled deck of 52 cards, there are 4 aces, 4 kings, 4 queens, 4 jacks, and 4 of each numbered card from 2 to 10. What is the probability that if you draw a card at random it will be a numbered card.
2. In the same setup as above, you take one card out and look at it, put it back into the deck and shuffle it. Now you pull another card out. What is the probability that both the cards you pulled out are numbered cards.
3. Same Problem as above, but now when you pull out one card, you throw it out and do not put it back into the deck. Find the probability now that they are both numbered cards that you drew.
4. Now the deck of card is not shuffled. All the cards are in sorted order, first all the cards from Ace to King of Spades, then Hearts, then Diamonds and then Clubs. You are asked to cut the deck (break it into 2 parts, i.e. pick some cards from the top) at a random location. What is the probability that the bottom card of your cut is an numbered cards card.

Practice Questions (from AML course - Prob Primer lab)

$$\textcircled{1} P(\text{choosing a numbered card}) = \frac{9 \times 4}{52/13} = \frac{9}{13}$$

$$\textcircled{2} P(\text{chosen card reshuffled, chose numbered card}) = \frac{9 \times 4}{52} = \frac{9}{13}$$

$\textcircled{3}$ Given: one card that was pulled is thrown
 \Rightarrow out of 36 numbered cards, one is thrown away.

\therefore Total no. of numbered cards now: 35
Total no. of cards in deck: 51

$$\rightarrow P(\text{choosing a number card}) = \frac{35}{51}$$

$\textcircled{4}$ stack of cards

A	}	Spades
2		
3		
4		
5		
6		
7		
8		
9		
10		
K		
A		
2		
3		
4		
5		
6		
7		
8		
9		
10		
K		
A		
2		
3		
4		
5		
6		
7		
8		
9		
10		
K		
A		
2		
3		
4		
5		
6		
7		
8		
9		
10		
K		

$P(\text{cutting the deck such that next card = numbered})$

$$= \frac{\cancel{40}}{\cancel{52}} \frac{36}{51} = \frac{12}{17}$$

\therefore we can cut in $(52-1)$ ways.