Homework 1

1. Draw 2 cards in sequence without replacement from a deck of 52 cards. Let A be the event that the first drawn card is an Ace, and B be the event that the second drawn card is a black-suit (i.e. Spades or Clubs) card.

   - What is the conditional probability $P(A|B)$?
   - What is the conditional probability $P(B|A)$?

2. Consider 12 persons with 6 males and 6 females. Divide them into 2 groups of 6 persons. What is the probability that both groups have an even number of males?

3. Draw 2 cards in sequence without replacement from a deck of 52 cards. Let A be the event that the drawn cards are both Aces, B be the event that at least one drawn card is an Ace, and C be the event that one drawn card is the Ace of Hearts.

   - What is the conditional probability $P(A|B)$?
   - What is the conditional probability $P(A|C)$?

4. Consider a fair coin and a biased coin, which lands Heads with probability $2/3$. Suppose a coin is selected (with equal probability) and flipped twice, and the outcome is a head followed by a tail. What is the probability that the selected coin is fair?