STAT1011 Assignment 2
[To obtain full marks, show your steps clearly.]

1. In how many ways can 8 people be seated in a row if
    a. there are no restrictions on the searing arrangement
    b. persons *A* and *B* must sit next to each other

2. A committee of 6 is to be selected from a group of 7 men and 8 women. Assume that the selection is made randomly, what is the probability that the committee consists of 4 men and 2 women?

3. Two cards are randomly selected from an ordinary playing deck (52 cards). What is the probability that they form a blackjack?

4. Two fair dice are rolled, what is the conditional probability that the first one lands on 6 given that the dice land on different numbers?

5. In a breeding experiment, the male parent is known to have either two dominant genes (symbolized by *AA*) or one dominant and one recessive (*Aa*). These two cases are equally likely. The female parent is known to have two recessive genes (*aa*). Since the offspring gets one gene from each parent, it will be either *Aa* or *aa*. [If the male parent is *Aa*, it is equally likely for the offspring to get *A* or *a* from him]
    a. If we suppose one offspring is *Aa*, what is the probability that the male parent is *AA*?
    b. If we suppose two offspring are both *Aa*, what is the probability that the male parent is *AA*?
    c. If one offspring is *aa*, what is the probability that the male parent is *Aa*?