FCS152 Tutorial 8
Discrete Probability

1. What is the probability of the following dice-throwing event happening:
    a. 1 dice, the number is an even number.
    b. 1 dice, the number is less than 5.
    c. 1 dice, the number is 7.
    d. 1 dice, the number is either odd OR less than 4.
    e. 1 dice, the number is both odd AND greater than 2.
    f. 1 dice, the number is both even AND less than 2.
    g. 2 dices, the sum is 6.
    h. 2 dices, the sum is 1.
    i. 2 dices, the sum is 8 AND both of them are even numbers.

2. Calculate the probability of the following coin flipping (HEAD or TAIL):
    a. 3 consecutive flips, all showing TAILS.
    b. 4 consecutive flips, at least one HEAD
    c. 5 consecutive flips, at least two TAILS.

3. You just moved into a new house. You have not meet your neighbor yet, but you know that they have 3 children. What is the probability of the neighbor having:
    a. 1 sons and 2 daughters.
    b. 2 sons, given that the fact they have at least 1 daughter.
    c. 1 daughter, given that the youngest one is 6 years old.

4. Suppose that 1 out of 10,000 people has a rare genetic disease. There is a new technology to diagnose this disease. 99.9% of people with the disease are tested positive. On the other hand, 0.02% of people WITHOUT the disease are tested positive.
    a. What is the probability that someone who receive *positive* result actually has the disease?
    b. What is the probability that someone who receive *negative* result actually does not has the disease?