I. Random variables

1. Suppose that we roll two die and let X be equal to the maximum of the two rolls. Find $P(X \in 1, 3, 5)$ and draw the PMF for X.

2. When rolling two die, let Y be equal to the first die roll. Are X, Y independent random variables?

3. I flip a fair coin 4 times. Let X be the number of heads I get. Draw the PMF for X.

4. I roll two fair four sided die with sides numbered $1 - 4$. Let X be the product of the two numbers rolled. Find the range of X and draw the PMF for X.

5. I draw 5 cards from a deck of cards. Let X be the number of hearts I draw. What is the range of X and draw the PMF of X. Use this to find the probability that I draw at least 2 hearts.

II. Binomial distribution

1. A coin is biased so that the probability of heads is 2/3. What is the probability that exactly four heads come up when the coin is flipped seven times, assuming that the flips are independent.

2. Suppose that the probability that a 0 bit is generated is 0.9, that the probability that a 1 bit is generated is 0.1, and that bits are generated independently. What is the probability that exactly eight 0 bits are generated when 10 bits are generated.