CS 333202: Probability and Statistics
HW2 Part I

1. Independent trials, consisting of rolling a pair of fair dice, are performed. What is the probability that an outcome of 5 appears before an outcome of 7 when the outcome of a roll is the sum of the dice?

2. Assume that the events A_1, A_2, A_3, A_4 are independent and that $P(A_3 \cap A_4) > 0$. Show that

$$P(A_1 \cup A_2 \mid A_3 \cap A_4) = P(A_1 \cup A_2)$$

3. Rank the following from most likely to least likely to occur.

   (a) A fair coin lands on heads.

   (b) Three independent trials, each of which is a success with probability 0.8, all result in successes.

   (c) Seven independent trials, each of which is a success with probability 0.9, all result in successes.