CSE 321: Discrete Structures
Assignment #6
February 15, 2001
Due: Wednesday, February 21

Reading Assignment: Rosen, Sections 4.3 - 4.5

Please read Sections 4.4 and 4.5 carefully and make sure that you understand the examples.

Problems:

1. A deck of 10 cards, each bearing a distinct number from 1 to 10, is shuffled to mix the cards thoroughly, so that each order is equally likely. What is the probability that the top three cards are in sorted (increasing) order?

2. A fair coin is flipped n times. What is the probability that all the heads occur at the end of the sequence?

3. Rosen, Section 4.4, problem 36.

4. Rosen, Section 4.5, problem 16.

5. Rosen, Section 4.5, problem 18.

6. Suppose a 6-sided dice is rolled. What is the expectation of the value showing? Suppose two 6-sided dice are rolled. What is the expectation of the value showing? What is the expectation of the maximum of the two values showing?

7. Rosen, Section 4.5, problem 32.

8. Rosen, Section 4.5, problem 44.

9. Rosen, Section 4.5, problem 46.

10. **Extra credit:** You are taking an exam with 6 questions. You haven't studied very much, so the probability that you can answer a given question is only 1/3. However, your neighbor, the best student in the class, can answer a given question with probability 9/10. So, you can (should?) do the exam by yourself, or you can try to cheat... For every question on which you try to cheat, there is a probability 1/6 that you will be caught. If you are caught, you get zero for the whole exam. However, if you are not caught, you get the answer from your neighbor, which is likely to be better than your own. What strategy will maximise your expected grade for this exam? That is, should you try to cheat? How many times?