Discrete Structures
CSE 321, Spring 1998

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Homework #8

Due at the beginning of class, Wednesday, June 3

Reading: Rosen, Sections 7.1– 7.4, 6.1, 2.3, 2.5.

Continued Policy: You are strongly encouraged to work in groups of 2 on this homework and turn in a single homework with both names on it. Both members of the group will receive the same score.

Don't let us have lonely office hours!

1. What is the probability that team A wins a best of 7 series against team B, if in each individual encounter team A has probability 6/11 of beating team B (and all encounters are independent)? (It suffices to write an expression for the probability, you don't have to sum or multiply stuff out.)
2. 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?
3. Suppose that a fair coin is tossed 100 times. What is the expected number of flips i in which the coin takes on the same value in both flip i and flip i+1? (So for example in the sequence HHHH, the answer is 3, because the coin takes on the same value in positions 1 and 2, 2 and 3, and 3 and 4. In the sequence THHHTT, the answer is also 3 because the coin takes on the same value in positions 2 and 3, 3 and 4, and 5 and 6.)
4. Rosen, Section 7.2, problem 2.
5. Rosen, Section 7.2, problem 6.
6. Rosen, Section 7.2, problem 14.
7. Rosen, Section 7.2, problem 44.
8. Consider the relation on integers R_m where

$$R_m = \{(a,b) \mid a \equiv b \pmod{m}\}$$

   - Display all the ordered pairs in the relation R_3 on the elements {0,1,2,3,4,5} graphically, as was done in Example 4 in section 6.1.
   - Determine whether the relation R_m is reflexive, symmetric, antisymmetric and/or transitive.

9. Rosen, Section 6.1, problem 14.
10. Rosen, page 423, problem 2.