CS1231 TUTORIAL 9

1. (a) How many integers from 1000 through 9999 have distinct digits?

(b) How many odd integers from 1000 through 9999 have distinct digits?

(c) How many odd integers from 5000 through 9999 have distinct digits?

2. How many ways are there for 10 women and 6 men to sit in a row so that no two men are next to each other?

3. Consider strings of length n over the set $\{a, b, c, d\}$. How many such strings contain at least one pair of adjacent characters that are the same?

4. How many integers from 1 through 999999 contain each of the digits 1, 2 and 3 at least once? (Hint: For each i let A_i be the set of integers from 1 through 999999 that **do not** contain the digit i.)

5. In how many ways can two distinct integers be chosen from $\{1, \ldots, 100\}$ so that their sum is (a) even? (b) odd?

6. In how many ways can three integers, not necessarily distinct, be chosen from $\{1, \ldots, 100\}$ so that their sum is even.

7. Let $X = \{1, 2, 3, 4, 5\}$ and $Y = \{1, 2, 3, 4\}$. How many onto functions $f : X \to Y$ are there?

8. In how many ways can 5 integers be chosen from $1, 2, \ldots, 100$ so that no two are consecutive?

9. How many integers from 1 through 1000 are:

(a) multiples 2 or multiples of 9?

(b) neither multiples 2 nor multiples of 9?