CS 228, Counting Exercises II

Name:

Some questions are from **Discrete Mathematics and It's Applications 7e** by Kenneth Rosen.

- A group contains 10 men and 10 women. How many ways are there to arrange these people in a row if the men and women alternate?

- How many subsets with more than two elements does a set with 100 elements have?

- How many permutations of the letters ABCDEFG contain the string BCD? The string CFGA? The strings BA and GF?

- Suppose that a department contains 9 men and 15 women. How many ways are there to form a committee with six members if it must have the same number of men and women?

Binomial Theorem:

$$(x+y)^n = \sum_{j=0}^{n} \binom{n}{j} x^{n-j} y^j$$

Pascal's Identity:

$$\binom{n+1}{k} = \binom{n}{k} + \binom{n}{k-1}$$

- Find the expansion of $(x+y)^4$ using the binomial theorem.

- What is the row of Pascal's triangle containing the binomial coefficients $\binom{9}{k}$, $0 \leq k \leq 9$?

- Use Pascal's identity and the answer to the previous question to produce the row of Pascal's triangle containing the binomial coefficients $\binom{10}{k}$, $0 \leq k \leq 10$.