Math 55 Lecture 12 §6.1, 6.2

Product Rule: Suppose that a procedure can be broken down into a sequence of two tasks. If there are

Ex: Counting subsets of a finite set.

Sum Rule: If a task can be done in one of n_1 ways or in one of n_2 ways, where

Ex: Lynn is selecting a main course from

Ex 1: Michael needs to choose a password, which is

Ex 2: Same as before, but now count passwords which have at least one digit.

Inclusion-Exclusion!

Suppose task can be done in n_1 or in n_2 ways, but some of the n_1 ways are the same as some of the other n_2 ways.

Tree diagrams:
A tree consists of

Ex: How many bit strings of length 4

Sol:

§6.2 Pigeonhole Principle: If $k+1$ pigeons fly into a set of k pigeonholes to roost, then

Cor:

Gen. Pigeonhole Principle: If N objects are placed into k boxes, then there is

Observation:

Pf:

Ex: Among 216 people there must be at least

Ex: What is the min # of students required in a discrete math class to be sure that

Ex: Show that among any $n+1$ pos. integers

Lemma:

Sol:

Ex: Assume that in group of 6 people, each pair of individuals consists of 2 friends or 2 enemies. Show that

Sol: