Today's Plan

Upcoming:

- PQ1 posted
- AQ1 next week

Last time:

- Combinations

Today's topics:

Chapter 1: Combinatorics

- 1.4: Combinations with repetition

Combinations with Repetition

Let's determine all the different ways in which we can write the number 4 as a sum of positive integers, where the order of the summands is considered relevant. These representations are called the *compositions* of 4.

Composition Example

How many compositions are there for the number 7?

Composition Example - cont'd...

Composition Example - cont'd...

Combinations Example

A *run* is a consecutive list of identical entries that are preceded and followed by different entries or no entries at all.

For example, if we had 5 E's and 10 O's arranged as follows:

OO E OOOO EEE OOO E O

Find the total number of ways 5 E's and 10 O's can determine 7 runs.

Combinations Example - cont'd...

Combinations Example - cont'd...

Combinations Example - cont'd...

Summary

select or order ***r*** objects from ***n*** distinct objects

order is relevant	repetitions are allowed	type of result	formula
		permutation	
		arrangement	
		combination	
		combination with repetition	