General Assembly

STUDY GUIDE

COMBINATIONS AND PERMUTATIONS

The Counting Principle

Also known as the **fundamental theorem of counting**.
If a job consists of k separate tasks and there are n1 ways of doing the first task, n2 ways of doing the second task, etc., there are n1 x n2 x ... nk ways of completing the entire job.

Factorials

n! is the number of ways to list a set of n objects.
Denote "n-factorial" or "factorial of n" as n!
n! = n x (n-1) x (n-2) ... 2 x 1
2! = 2 x 1 = 2
3! = 3 x 2 x 1 = 6
Remember, 0! = 1.

Definitions

Permutation: An arrangement of objects without repetition in which order matters.
Combination: An arrangement of objects without repetition in which order doesn't matter.

Permutation Formula

P(n,k) = n! / (n-k)!, where n is the total number of options and k is the number of options we want to choose.

Combination Formula

C(n,k) = n! / (n-k)!k!, where n is the total number of options and k is the number of options we want to choose.