CS151 Fall 2014
Lecture 19 – 10/30

Combinatorics: Still Counting

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http://www.cs.uic.edu/bin/view/CS151/WebHome

Counting!

- How many 4 symbol PINs are there with letters, numbers, repetitions allowed, not case sensitive?
- PINs without repetitions?
- Bit strings of length 5?
- Bit strings of length 5 that start and end with the same bit?
- Iterations of a nested loop? For i=1..n For j= 1..m ….
- 10 pages ranked 1st. How many orderings are there of those ten pages?
- Ways the letters of the word COMPUTER can be arranged in a row?

For any non-negative integer *n*, the number of permuitations of a set with *n* elements is *n!*

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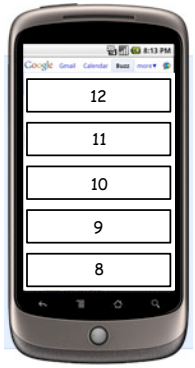
Permutations of Selected Elements

A search engine returns 12 top ranked results but on the mobile interface only 5 can appear on the first page. How many ways are there to display the results of the first page



a) 60
b) 12^5
c) 12!/7!
d) 5^{12}
e) No clue

A permutation is an ordered arrangement of objects.

The number of permutations of r distinct objects chosen from n distinct objects is denoted P(n,r).

$P(n,r) = n! / (n-r)!$

Practice with Permutations

- What is P(5,2)?
- How many 4-permutations are there of a set of 7 objects?
- How many 5-permutations are there of set of 5 objects?