1 6.5: Generalized Permutations and Combinations (cont.)

Permutations with indistinguishable objects

Words with repeated letters

In the word SUCCESS, we have 3 equal S characters and 2 equal C characters.

This results in $\frac{7!}{3!2!1!1!}$ possible arrangements.

In the word MISSISSIPPI, we have 4 S, 4 I, 2 P.

This results in $\frac{11!}{4!4!2!}$ possible arrangements.

Card game

We have 4 unique card players. We deal a hand of 5 cards to each, from a 52-card deck of unique cards.

This results in $\frac{52!}{5!5!5!5!32!}$ possible arrangements, or $C(52,5) \cdot C(47,5) \cdot C(42,5) \cdot C(37,5)$

Basketballs

We have 10 indistinguishable basketballs and 8 unique SUVs. It is possible to fit all 10 basketballs in a single SUV.

Using the Stars and Bars technique,

SUVs ("types"): A B C D E F G H

Bit strings: 00000000001111111, or 11100000111100000, and so on.

$C(17,10)$