10.1 Counting Principle & Permutation

Permutation - a way of ordering things

Order K, T & C 6 ways

1st 2nd 3rd

$3 \cdot 2 \cdot 1 = 3 \cdot 2 \cdot 1 = 6$

$3 \cdot 2 \cdot 1 = 3!$ 3 factorial

$5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 5! \rightsquigarrow 120$

$91 \cdot 90 \cdot 89 \cdots 2 \cdot 1 = 91! \rightsquigarrow$ error .. bigger than $9.99999999 \times 10^{99}$

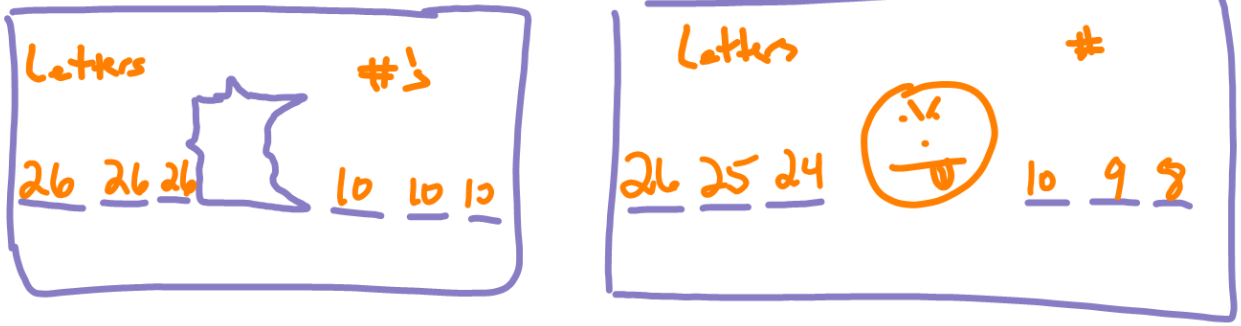
Fundamental Counting Principle

If one event can happen "m" ways & another happens "n" ways, the total outcomes is $m \cdot n$

Example

Plates in MN have 3 letters & 3 #'s

A-Z 26 letters & 0-9 = 10 #'s



With repeating

$26 \cdot 26 \cdot 26 \cdot 10 \cdot 10 \cdot 10$

$= 17,576,000$

W/o repeating

$= 11,232,000$