1/25/23

Fundamental Counting Principle and Factorials

Fundamental Counting Principle- if one event has m possible outcomes and a second independent event has n possible outcomes, then there are $m \cdot n$ total possible ways for the two events to occur.
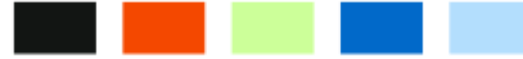
Ex:

If you own 5 shirts and 3 pairs of pants, then you have $5 \cdot 3$ or 15 possible outfits to wear.

Baskin Robbins sells 31 different flavors of ice cream. You can get your ice cream in a cup, on a sugar cone, or on a regular cone. How many different single scoop ice creams can you order?

There are **2** body styles:
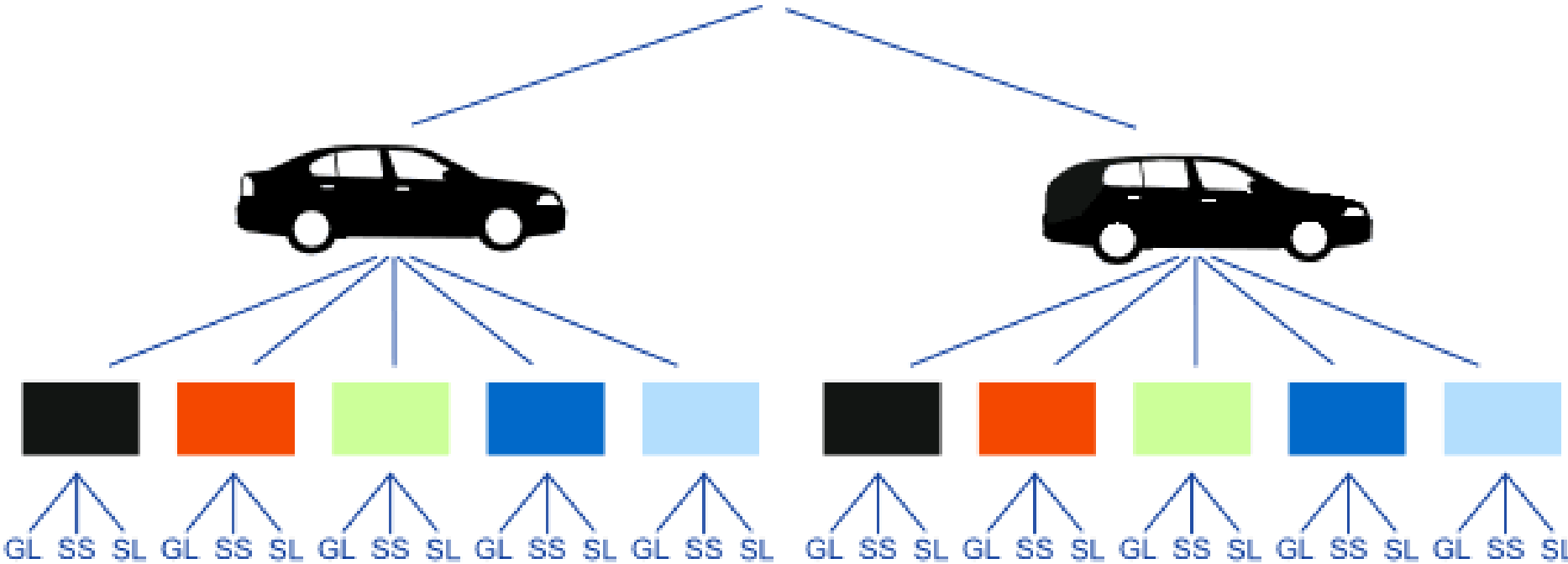
sedan or hatchback

There are **5** colors available:

There are **3** models:

- GL (standard model),
- SS (sports model with bigger engine)
- SL (luxury model with leather seats)

How many total choices?

My New Car

GL SS SL	GL SS SL	GL SS SL	GL SS SL	GL SS SL	GL SS SL	GL SS SL	GL SS SL	GL SS SL	GL SS SL

Factorials:

for a positive integer n, n factorial written $n!$ Is defined as

$$n! = n \times (n-1) \times (n-2) \times \ldots \times 3 \times 2 \times 1$$

$0! = 1$ (so we don't end up dividing by 0)

Try:

1. $\dfrac{8!}{5!}$ 2. $\dfrac{11!}{6!}$ 3. $\dfrac{10!}{4!}$ 4. $\dfrac{9!}{5!4!}$ 5. $\dfrac{12!}{7!5!}$