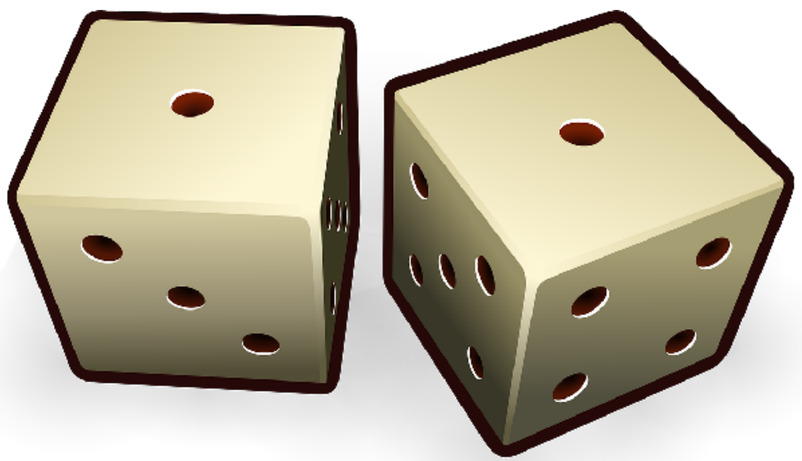


Probability Concepts

Principles of Counting

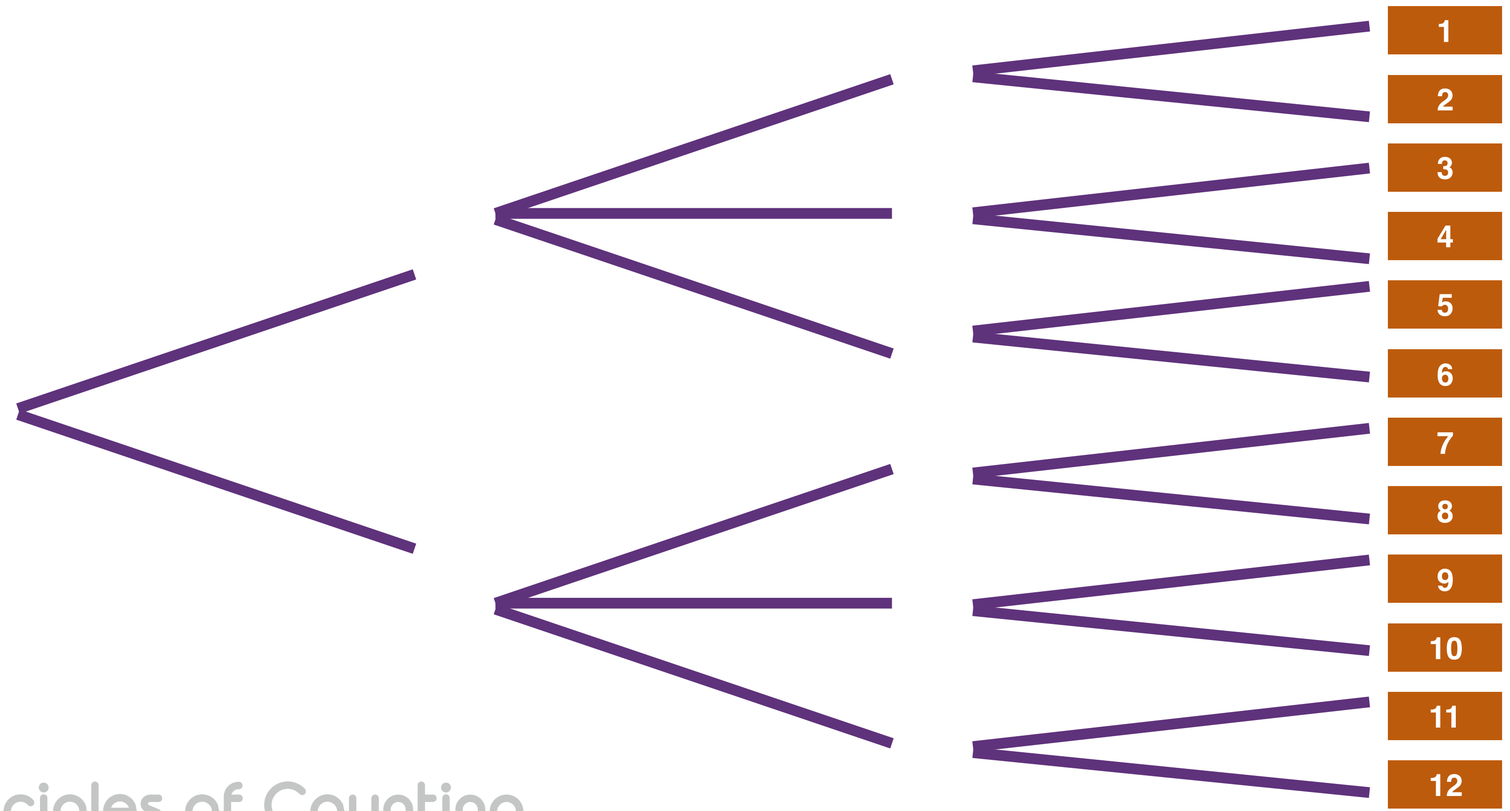
PREP nuggets

Principles of Counting

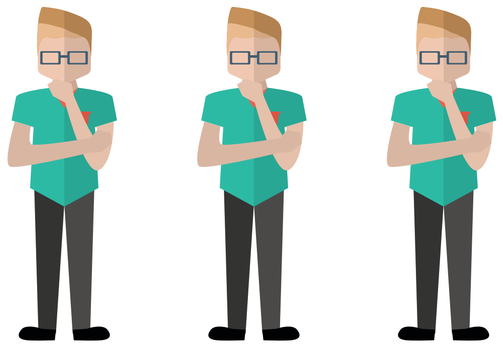
*help to determine the **total number of possibilities** in a problem*

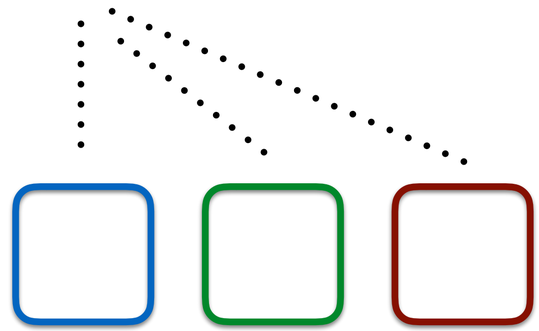
Multiplication Rule of Counting

2 x 3 x 2 = 12



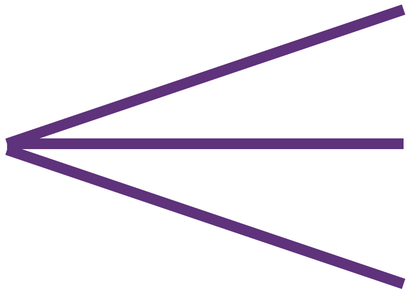
Multiplication Rule of Counting



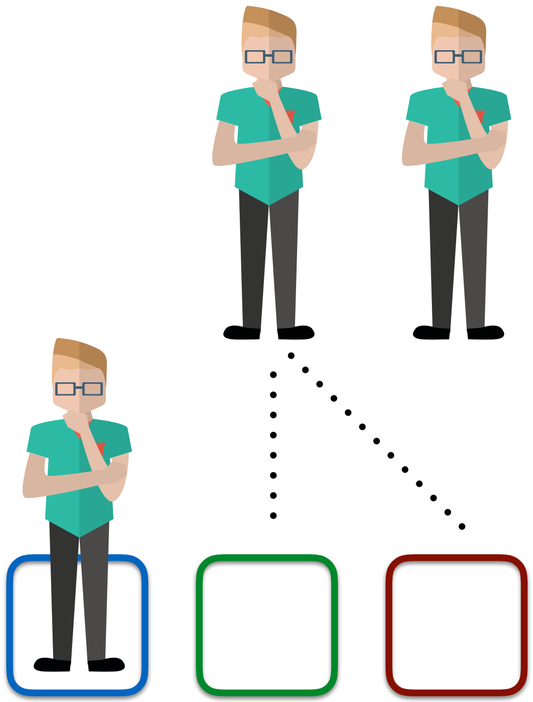


How many ways to assign?

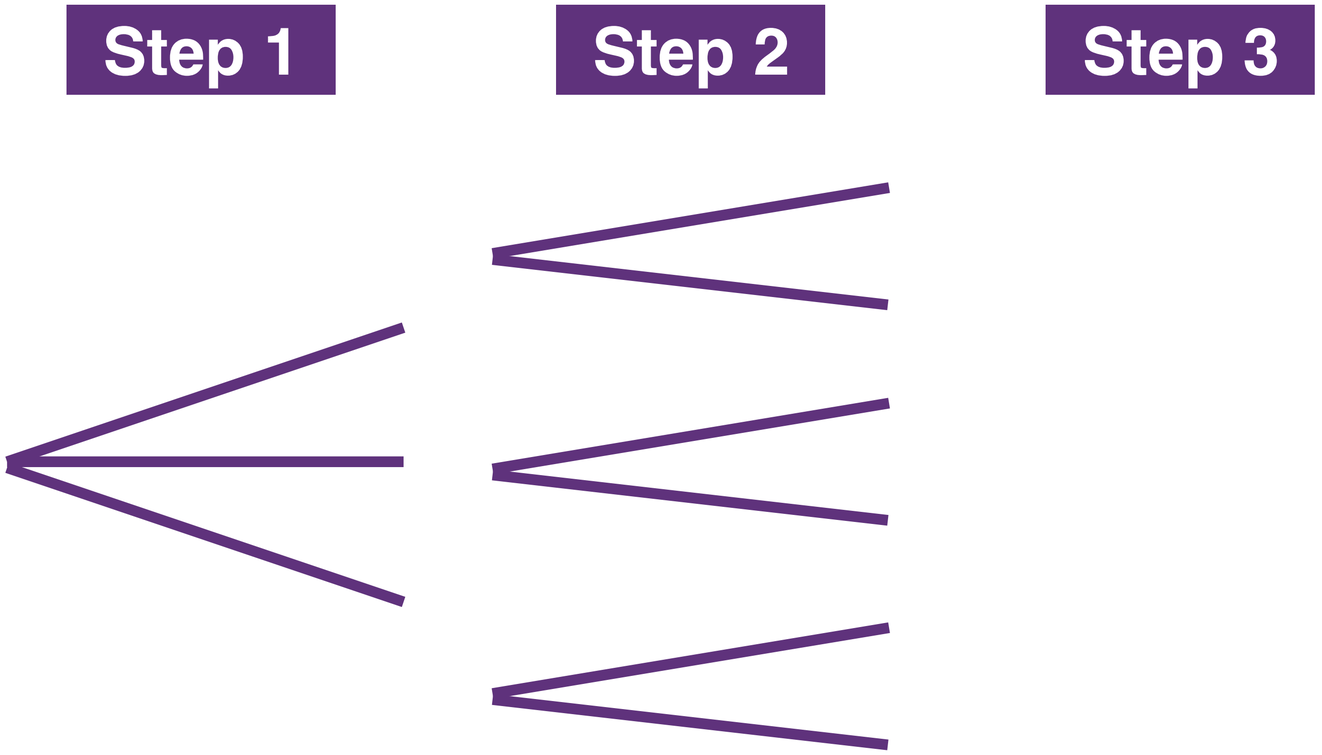
Step 1 **Step 2** **Step 3**



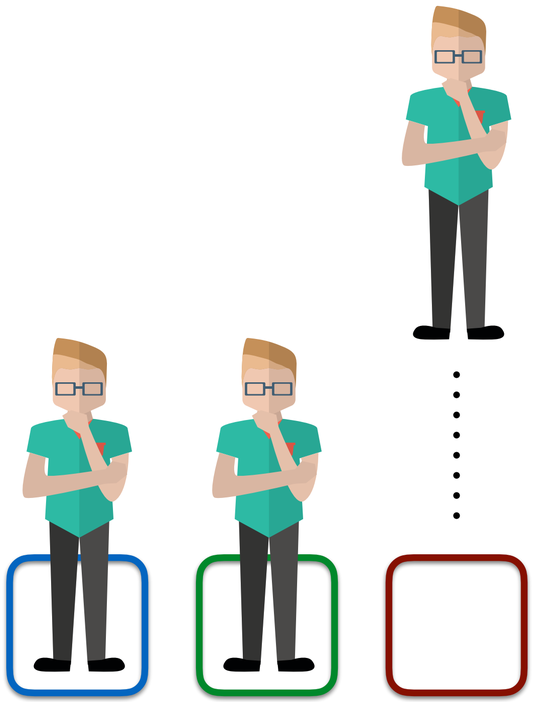
Multiplication Rule of Counting



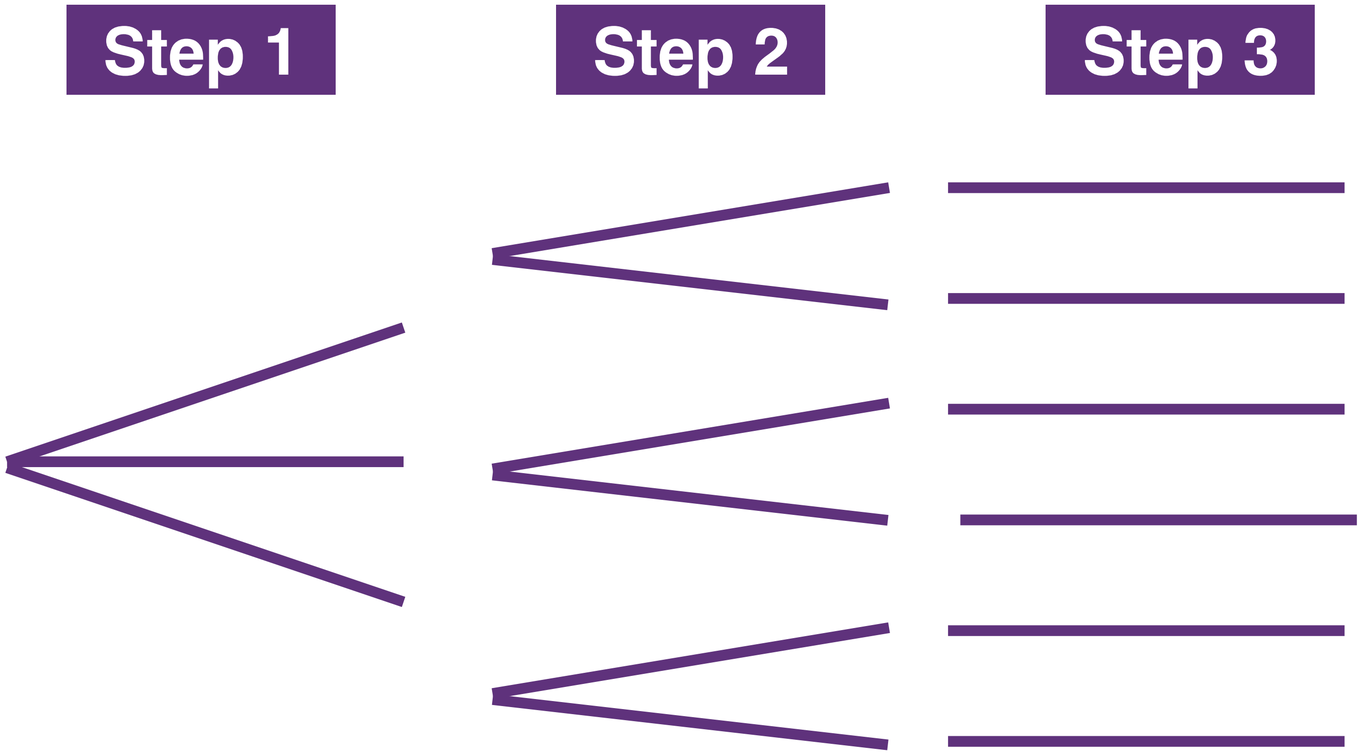
How many ways to assign?



Multiplication Rule of Counting



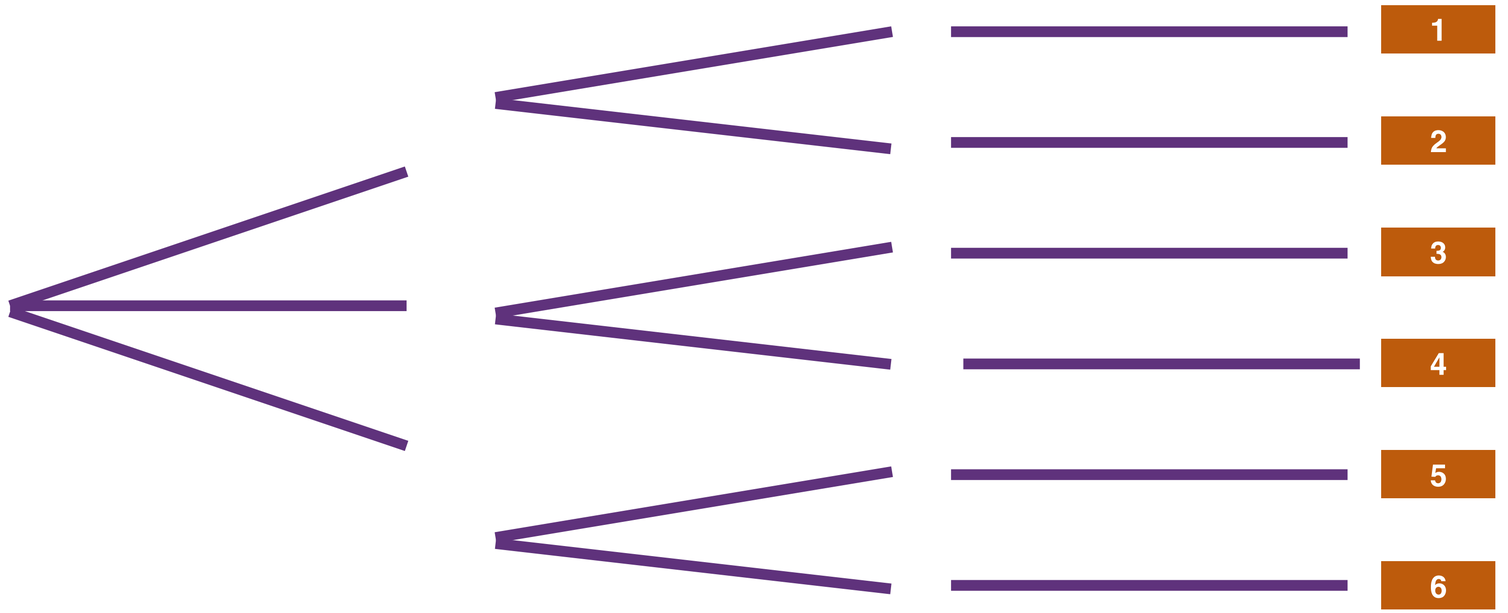
How many ways to assign?

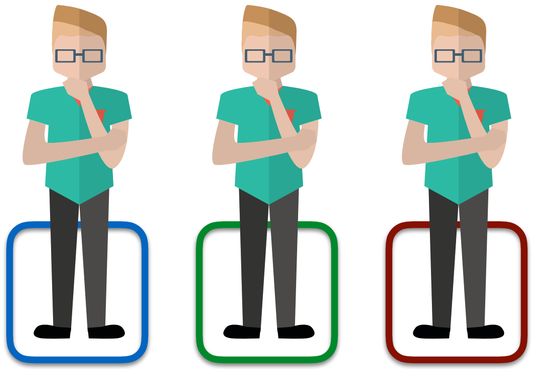


Multiplication Rule of Counting

3 x 2 x 1 = 6

Step 1 | Step 2 | Step 3





How many ways to assign?

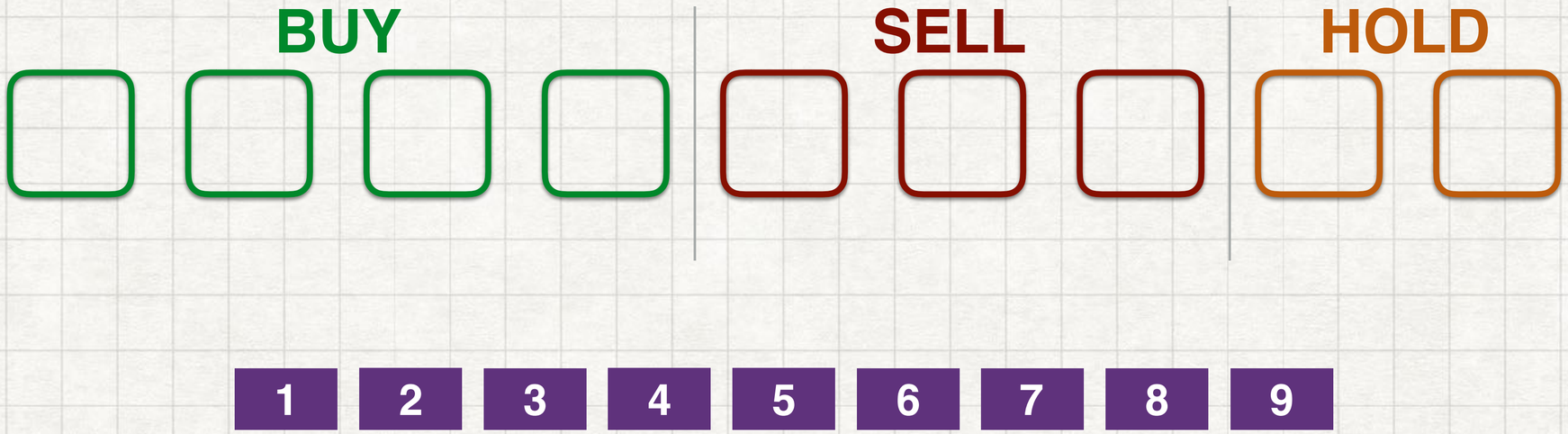
Factorial

n x (n-1) x (n-2) x .... x 1 = n!

3

3!

You are an analyst covering 9 stocks. You are required to label 4 stocks as a “Buy”, 3 stocks as a “Sell” and 2 stocks as a “Hold”. How many ways can these 9 stocks be labeled?

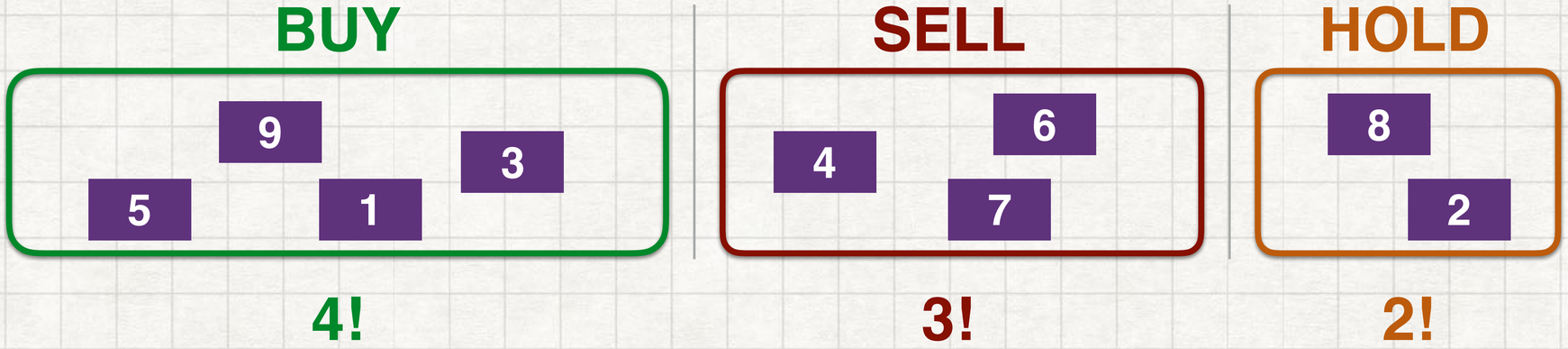


You are an analyst covering 9 stocks. You are required to label 4 stocks as a “Buy”, 3 stocks as a “Sell” and 2 stocks as a “Hold”. How many ways can these 9 stocks be labeled?

Total Possible Sequences = 9! = 362,880

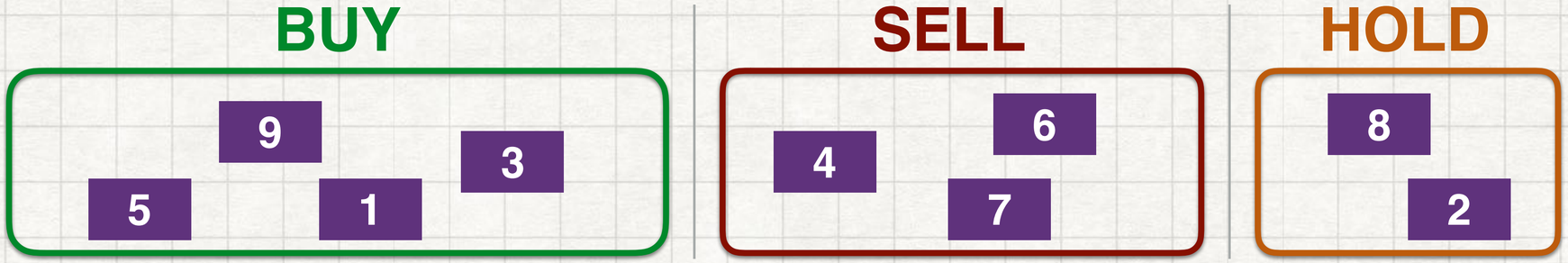
You are an analyst covering 9 stocks. You are required to label 4 stocks as a “Buy”, 3 stocks as a “Sell” and 2 stocks as a “Hold”. How many ways can these 9 stocks be labeled?

Sequence does not matter



Total Possible Sequences = 9! = 362,880

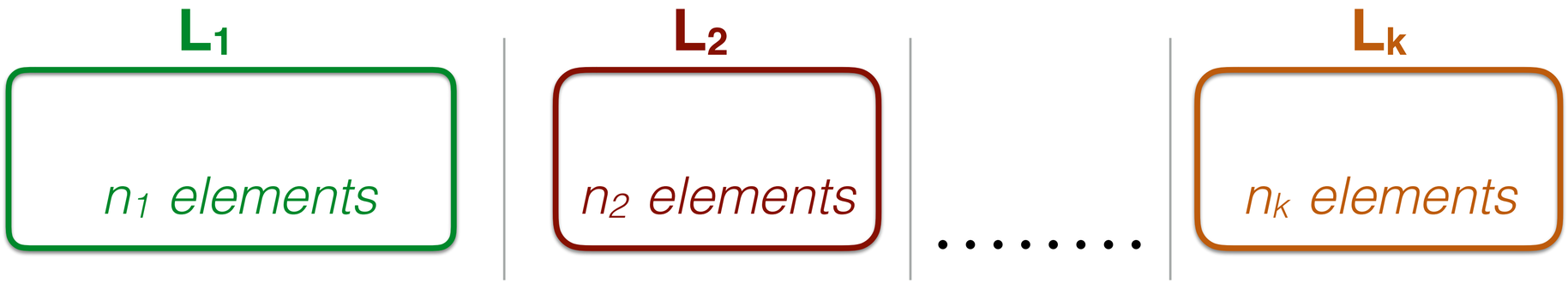
You are an analyst covering 9 stocks. You are required to label 4 stocks as a “Buy”, 3 stocks as a “Sell” and 2 stocks as a “Hold”. How many ways can these 9 stocks be labeled?



$$\text{Number of different ways to assign the 9 stocks} = \frac{9!}{4! \times 3! \times 2!} = \frac{362{,}880}{24 \times 6 \times 2}$$

$$= 1260$$

Multinomial Formula



$$n_1 + n_2 + \ldots + n_k = n$$

$$\text{Num of Ways} = \frac{n!}{n_1!\, n_2! \ldots . n_k!}$$

Combination Formula

Sequence is not important

Selected	Not Selected
3 *stocks*	***1*** *stock*

1 2 3 4

"n choose r"

$$ {}_nC_r = \frac{n!}{r!\,(n-r)!} $$

Combination Formula

Sequence is not important

Selected

2	4	1

3 *stocks*

Not Selected

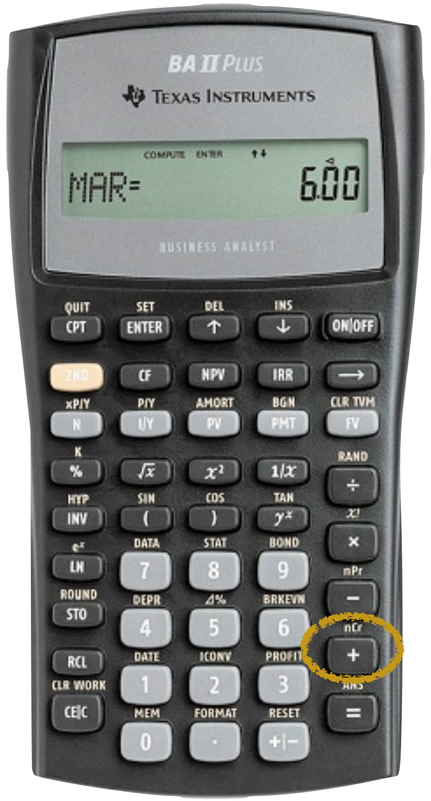
3

1 *stock*

$$_4C_3 = 4! / 3!1! = 4$$

"n choose r"

$$_nC_r = \frac{n!}{r!\,(n-r)!}$$



4

2ND nCr

3 =

Permutation Formula

Sequence is IMPORTANT

Selected

2 4 1

3 stocks

Not Selected

3

1 stock

$$_4P_3 = 4! / 1! = 24$$

$$_nP_r = \frac{n!}{(n-r)!}$$

4

2ND nPr

3 =

prepnuggets.com