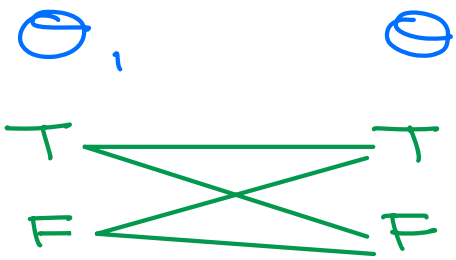
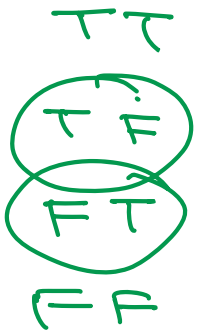
Q A quiz has Two answers

T

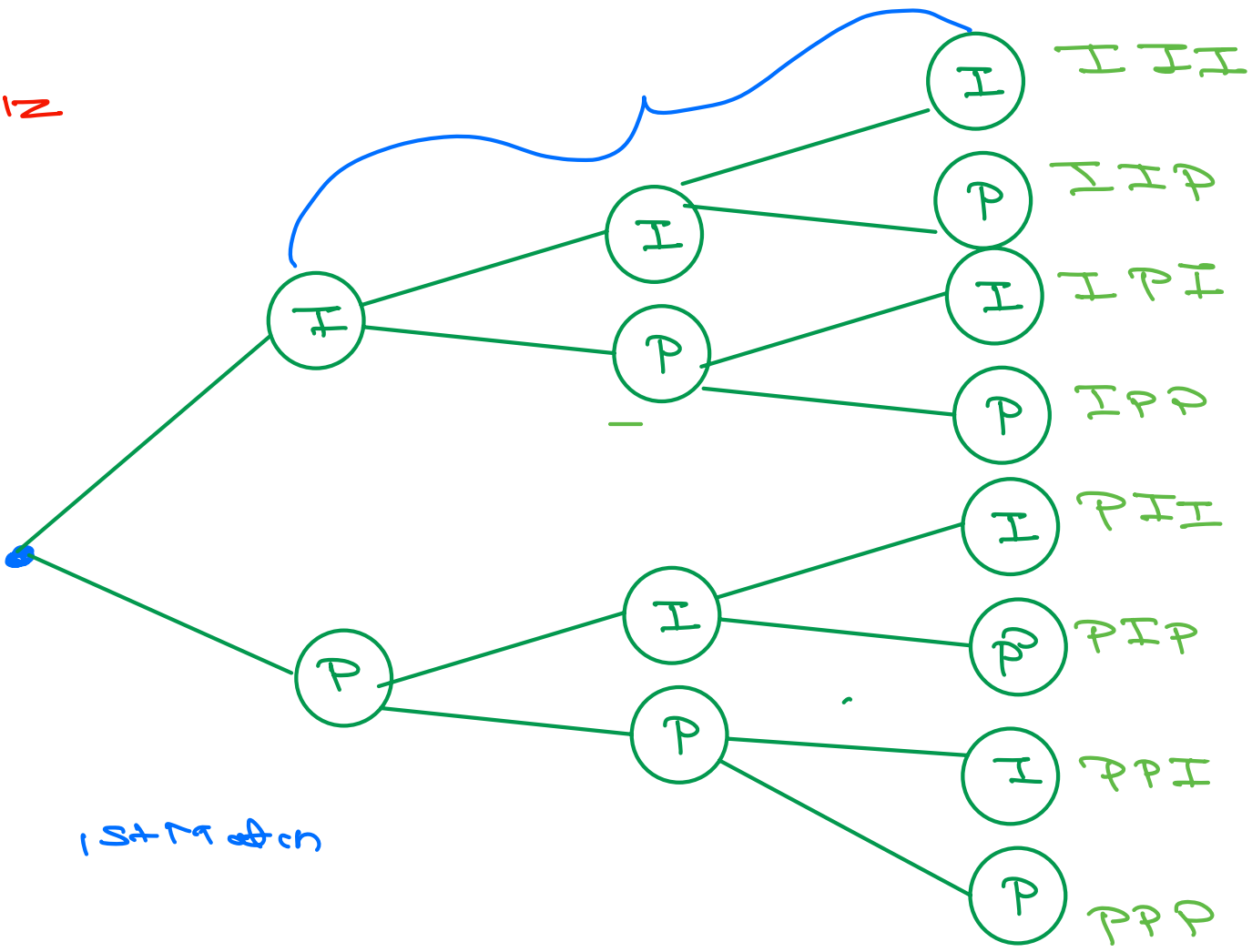
F

Possible way in which you can Solve Two Questions





Quiz



Station

Two outcomes with repetitions and n trials/Events $\rightarrow 2^n$

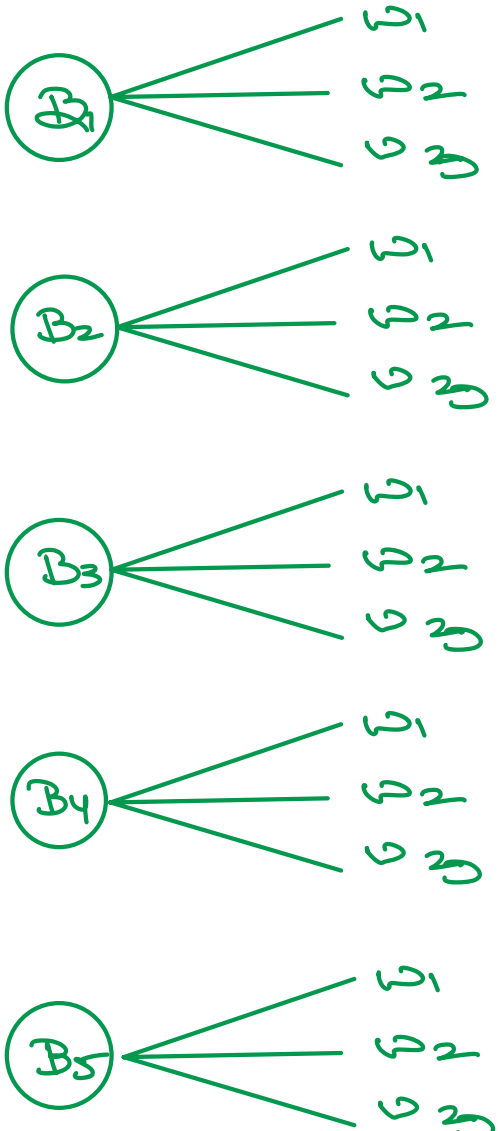
(n-trials)

possible Outcomes

Q 5 bowlers available

3 wicket keepers available

and



B_1w_1
B_1w_2
B_1w_3

B_2w_1
B_2w_2
B_2w_3

99

93

92

B and G ≠ B or G

* +

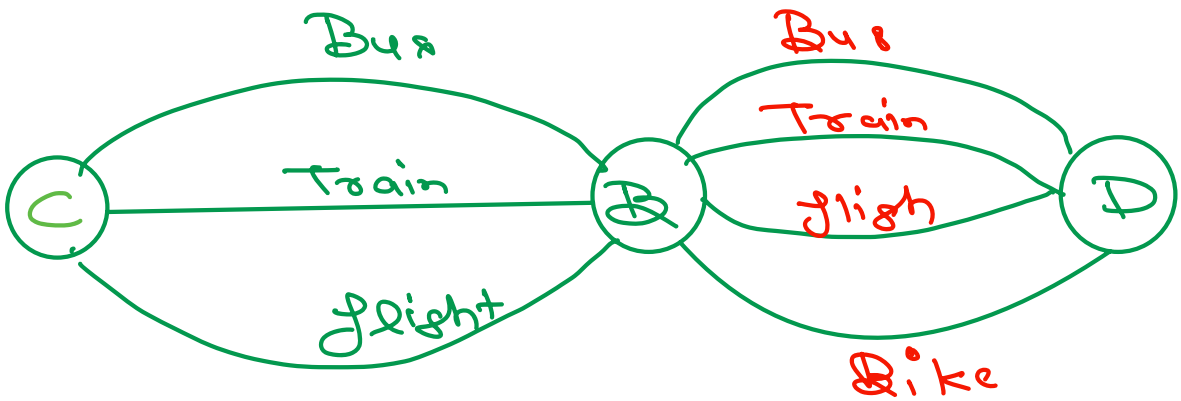
5 x 3 = 15

There are 3 ways to move from Chennai to Bangalore.
There are 4 ways to move from Bangalore to Delhi. In how many ways can one reach from Chennai to Delhi via BLR?

4 options

Active Duration(Most preferred: 30 seconds)

Quiz



C B D

Bus	Bus
Bus	Train
Bus	Flight
Bus	Bike
Train	Bus
Train	Train

9 9

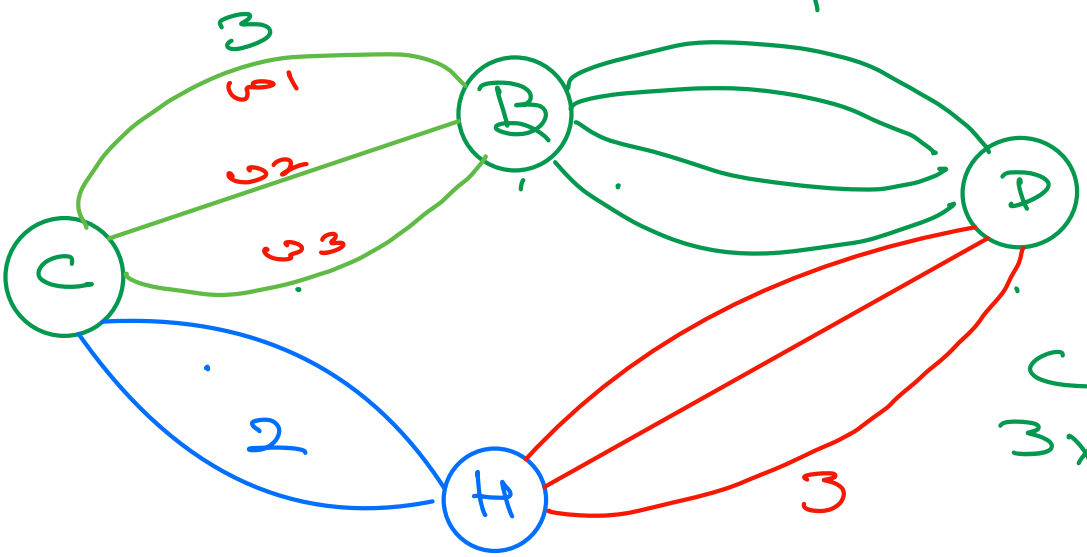
12 ways

4 x 3

Quiz

There are 3 ways to move from Chennai to Bangalore, and 4 ways to move from Bangalore to Delhi.
There are 2 ways to move from Chennai to Hyderabad, and 3 ways to move from Hyderabad to
Delhi. In how many ways can we move from Chennai to Delhi?

4 options



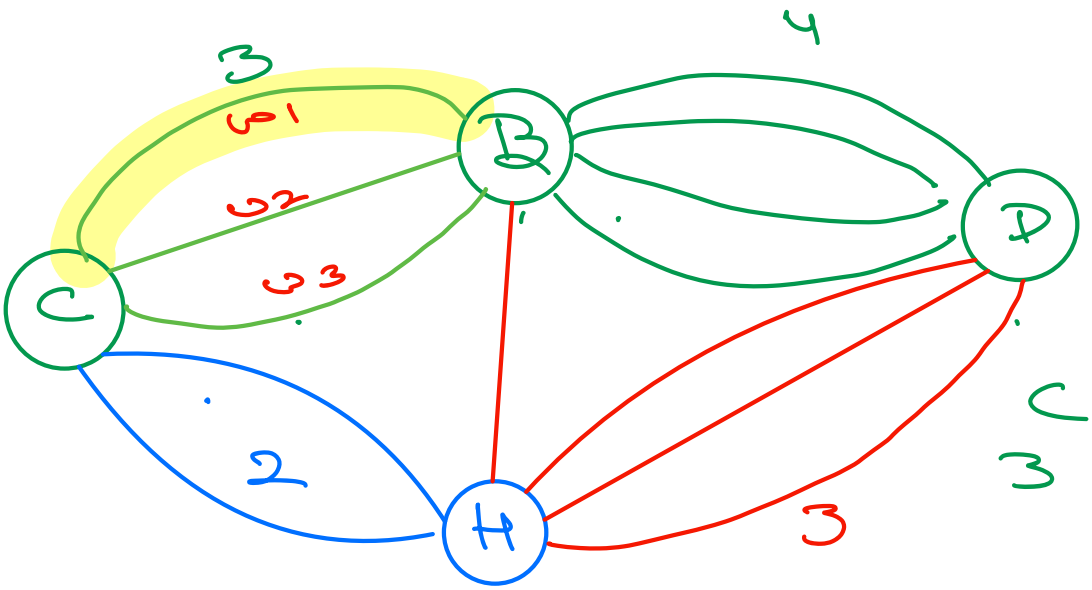
C B D
3 x 4
= 12

C H D
3 x 2 = 6

CBD + CHD
12 + 6 ✓

CBD x CHD
✗

Q. H.W



A fast food outlet has the following types of items in their menu:

- **Burgers: 3**
- **Pizzas: 3**
- **Drinks: 3**
- **Sandwiches: 5**
- **Fruits: 7**

From these items, you can choose one of the following combos:

- **1 Buger and 1 Sandwhich** C_1
- **1 Fruit and 1 Drink** C_2
- **1 Pizza** C_3

How many different combos can you order ?

C_1 → B and S → $3 \times 5 = 15$

C_2 → F and D → $7 \times 3 = 21$

C_3 → P → 3

C_1 or C_2 or C_3

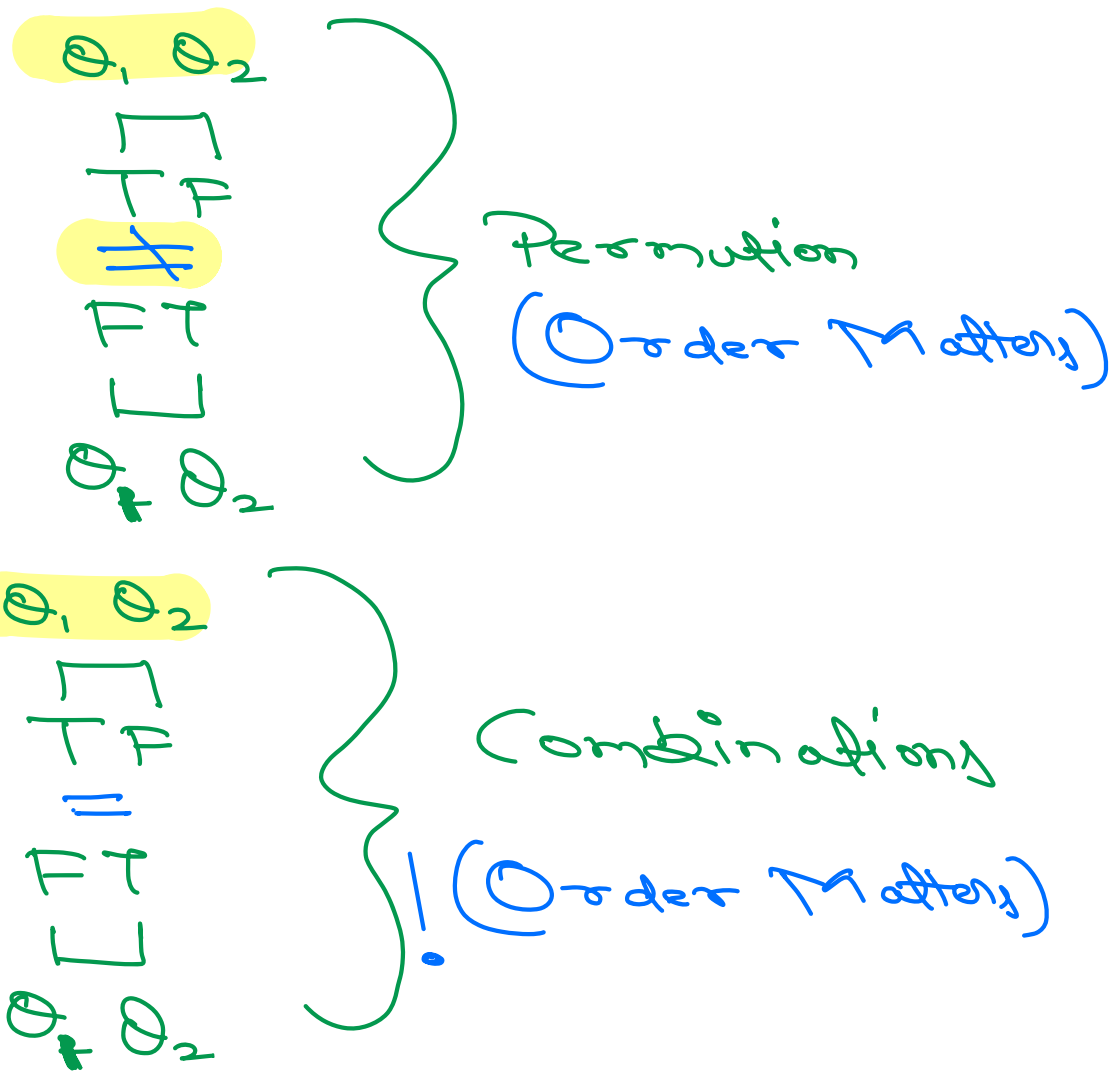
$15 + 21 + 3$

Permutation

- Arrangement of Items

Combination

- Selection of Objects



Ques

IPI

IPP

PII

PIP

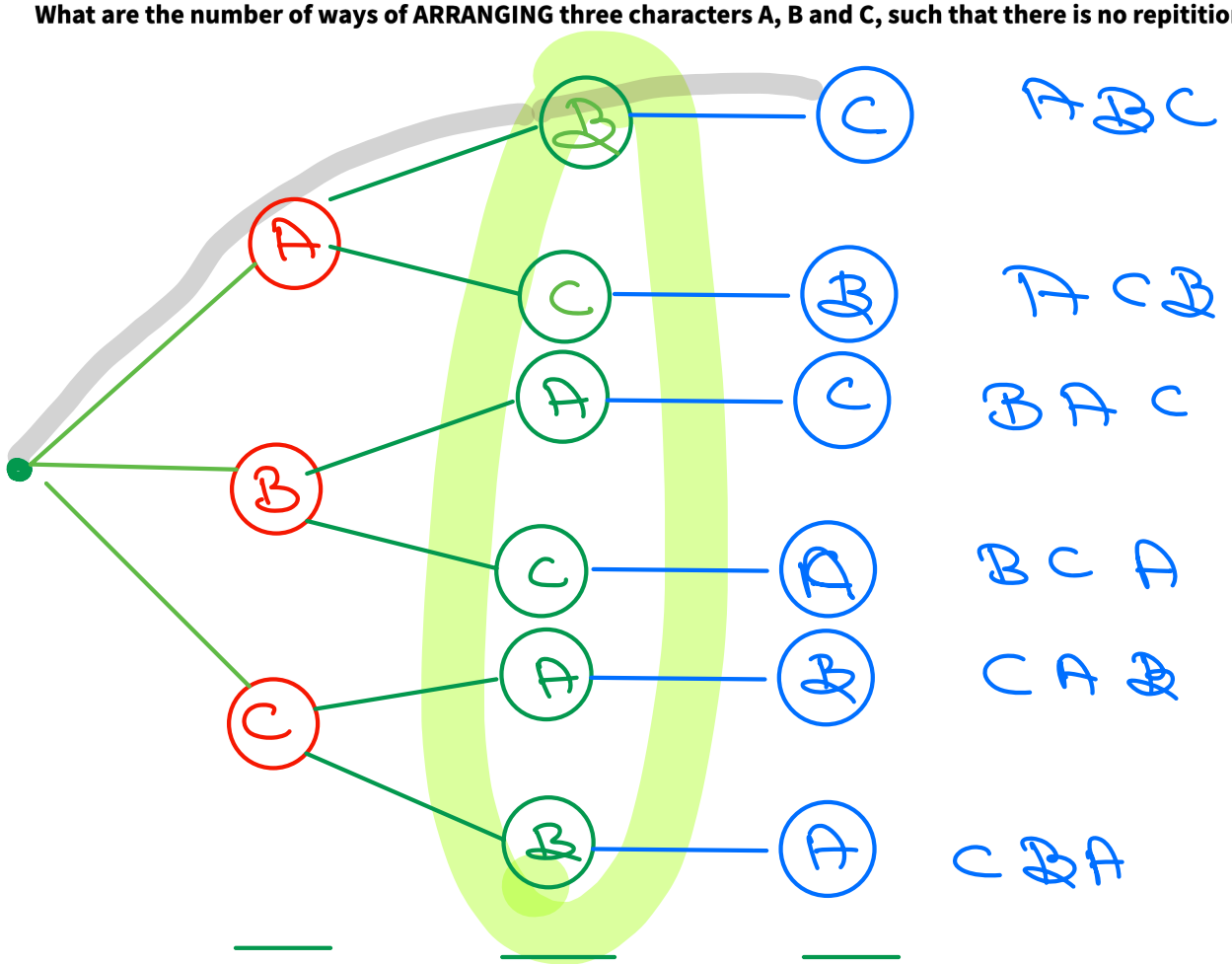
Combinations ?

2 possible combinations

Quiz time!

Time Left: 27s

What are the number of ways of ARRANGING three characters A, B and C, such that there is no repitition?



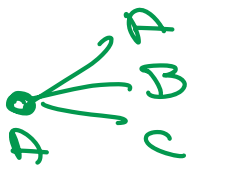
6 permutations

2 combinations

2 Repetitions

3!

3 ** 3



3 x 3 x 3

Quiz time!

Time Left: 32s

In how many ways can the letters of the word "COMPUTE" be arranged such that the vowels always come together?

V → O U E

3!

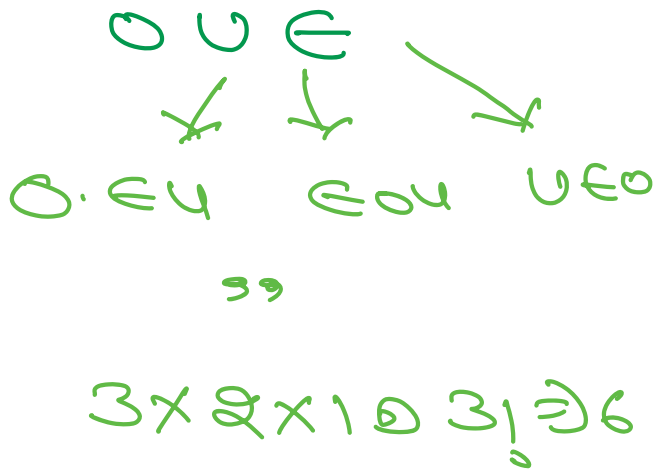
O U E

_____ _____ _____ _____ _____

5!

4 slots of C's

1 slot of V's

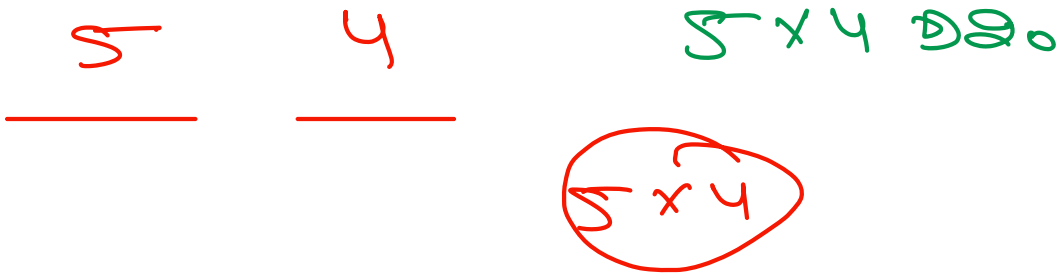


5! x 3! D 120 x 6

Quiz time!

Time Left: 35s

Given 5 different characters, in how many ways can we arrange them in 2 places, without repitition?



Formula for Permutation

- Arrange N objects in k slots

$$ {}^{N}P_{k} \Rightarrow \frac{N!}{(N-k)!} $$

2 → 5x4

3 → 5x4x3

4 → 5x4x3x2

5 → 5x4x3x2x1

↓

5!

2 slots → $\frac{5!}{(5-2)!}$ → $\frac{5 \times 4 \times 3 \times 2 \times 1}{3!}$ → 20

${}^{5}P_{5}$ → $\frac{5!}{(5-5)!}$ → $\frac{5!}{0!}$ → 5!

Quiz time!

Time Left: 41s

There are 4 players P1, P2, P3, and P4 who can play in the top-order batting positions of 1, 2, and 3. How many arrangements of top-order can we make from 3 of these 4 players, keeping in mind the order in which these batsmen come?

P_1
P_2
P_3
P_4

Approach 1

4	3	2
S_1	S_2	S_3

$4 \times 3 \times 2 = 24$

Approach 2 $n = 4$

$k = 3$

$$\frac{n!}{(n-k)!} = \frac{4!}{(4-3)!}$$

$= 24$

Comb1	Comb 2	Comb3	Comb4
P1, P2, P3	P1, P2, P4	P1, P3, P4	P2, P3, P4
P1, P3, P2	P1, P4, P2	P1, P4, P3	P2, P4, P3
P2, P1, P3	P2, P1, P4	P3, P1, P4	P3, P2, P4
P2, P3, P1	P2, P4, P1	P3, P4, P1	P3, P4, P2
P3, P1, P2	P4, P1, P2	P4, P1, P3	P4, P2, P3
P3, P2, P1	P4, P2, P1	P4, P3, P1	P4, P3, P2

24 permutations

4 Combination How?

Q 3 players Only

arrange them → 3!

Arrange 3 players out of 4

$$\frac{{}^4P_3}{3!} \quad \frac{24}{3!} \quad \frac{24}{6}$$

4

$$^{N}C_{k} = \frac{^{N}P_{k}}{k!} = \frac{N!}{(N-k)!\,k!}$$

$$^{N}C_{k} = \frac{N!}{k!\times(N-k)!}$$

Q. Select 5 players out of 7

$$7 = \frac{7!}{(7-5)!\times 5!}$$

A Maruti Showroom has 3 colours in their "Baleno" model and 3 different colours in the "Swift" model.
In how many ways can they place these 6 cars, such that Baleno and Swift are kept in alternate slots?

5 options

B_1 S_1
B_2 S_2
B_3 S_3

3 (Swift) 3 (Baleno) 2 (Swift) 2 (Baleno) 1 (S) 1 (B)

⇒ $3 \times 3 \times 2 \times 2 \times 1 \times 1 = 36$

3 (Baleno) 3 (Swift) 2 (Baleno) 2 (Swift) 1 (B) 1 (S)

36

⇒ Total ⇒ 36 + 36 ⇒ 72

Q 3 digit (10 possible 0-9

0 X		
9	10	10

$9 \times 10 \times 10 = 900$

10^3