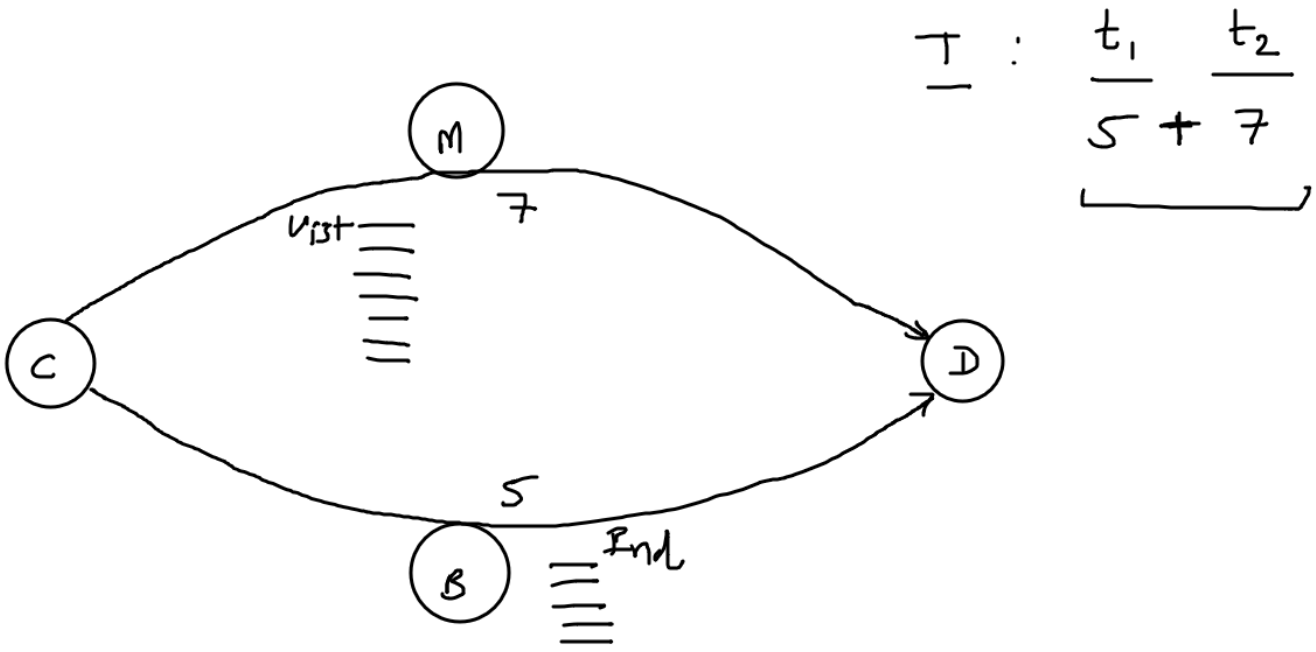
Quiz-4. Chennai to Delhi II

To reach Delhi from Chennai one can go either via Bangalore or via Mumbai. There are 5 flights that go via Bangalore and 7 flights via Mumbai. Total how many combinations of flights a person can have to go to Delhi from Chennai?

A. 35
B. 12
C. 25
D. 10



$T : t_1 \quad t_2$

$5 + 7$

Sum Rule: If a task T can be divided into p subtasks t1, t2, ... , tp AND, there are n1 ways to do t1, n2 ways to do t2, ... , np ways to do tp AND to perform the main task T it is necessary to perform ONLY ONE OF t1, t2, ... , tn THEN no. of ways to perform main task T = n1 + n2 + ... + np

Quiz-11. In how many ways can we choose two coders from 5 students to represent our college in a national hackathon?

A. 35
B. 12
C. 25
D. 10

$5 \times 4 = 20$

A, B, C, D, E

AB ~~BA~~ ~~CA~~ ~~DA~~ ~~EA~~

AC BC ~~CB~~ ~~DB~~ ~~EB~~

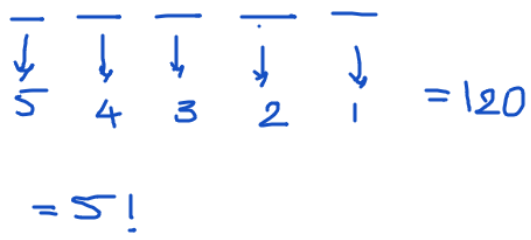
AD BD CD ~~DC~~ ~~EC~~

AE BE CE DE ~~ED~~

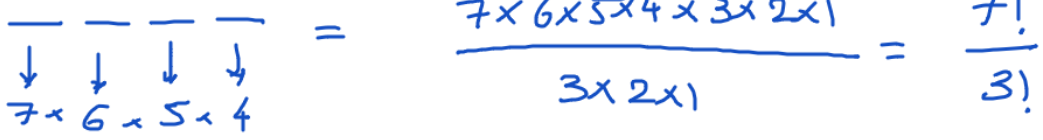
Permutation & Combination:

Permutation: When order matters. (When AB & BA should be considered different arrangements)
Combination: When order doesn't matter. (When AB & BA should be considered same arrangements)

Permutaion: In how many ways, 5 characters can be arranged?



In how many ways, 7 characters can be arranged in 4 places?



In how many ways, 6 characters can be arranged in 2 places?

In how many ways, 'n' characters can be arranged in 'r' places? $\Rightarrow {}^{n}P_{r} = {}^{n}P_{r} = \frac{n!}{(n-r)!}$

Important Note: Repeatition is NOT ALLOWED in either permutation or combination

In how many ways can we choose a team of 4 coders to play international hackethon from the group of 7 coders?
As the order is not important, we will use combination.

$$ {}^{n}C_{r} = {}^{n}C_{r} = \binom{n}{r} = \frac{n!}{r!(n-r)!} $$

$$ {}^{7}C_{4} = \frac{7!}{4! \times (7-4)!} = \frac{7!}{4!\ 3!} = \frac{7 \times 6 \times 5 \times 4!}{4! \times 3 \times 2} = 35 $$