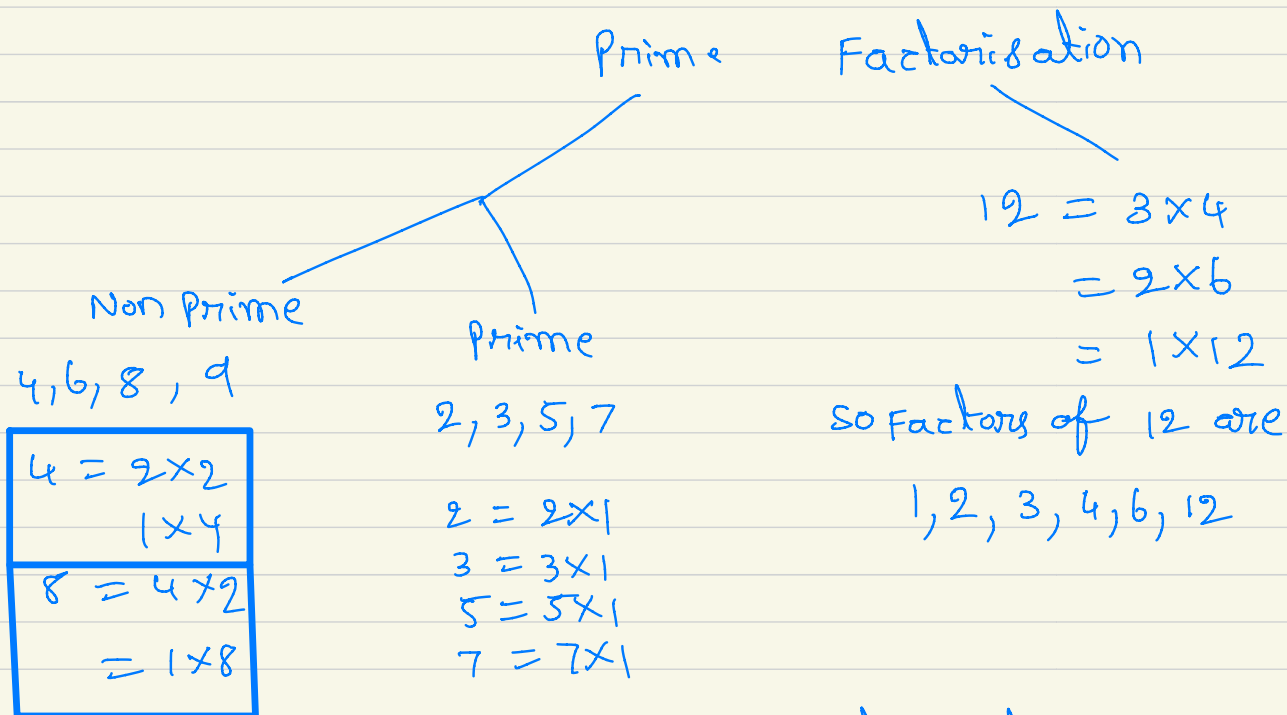


Prime Factorization



Now prime Factorisation

$$12 = 1, 2, 3, 4, 6, 12$$

$$\begin{array}{c} \downarrow \downarrow \\ 2, 3 \end{array}$$

prime Factorisation of 12 is

$12 = 2 \times 2 \times 3$

Now coming to the problem [count trailing zero's in Factorial]

\swarrow^{10}
Factorial

$$1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8 \times 9 \times 10$$

Now the idea is to count how many 2's (&) 5's we have in the prime factorization of the given factorial. so if i have a number

and i want to count trailing zeros. I have to write down prime factorisation of that number

Eg: 10

$$2 \times 5 = 10$$

$$\boxed{2, 5} \rightarrow \text{PF}$$

12
↓

$$\begin{matrix} 6 \times 2 \\ 4 \times 3 \end{matrix}$$

$$\rightarrow 2, 3, 4, 6$$

↓

$$\boxed{2, 3} \rightarrow \text{PF}$$

so to find the trailing zero consider the pair of

$$\boxed{2 \text{ and } 5}$$

Because 2 and 5 together form trailing zero

•) Now count number of 5's are there

10

$$1 \times 2 \times 3 \times 4 \times \underset{|}{5} \times 6 \times 7 \times 8 \times 9 \times \underset{|}{10}$$

$$\left\lfloor \frac{n}{5} \right\rfloor + \left\lfloor \frac{n}{25} \right\rfloor + \left\lfloor \frac{n}{125} \right\rfloor + \dots$$

floor