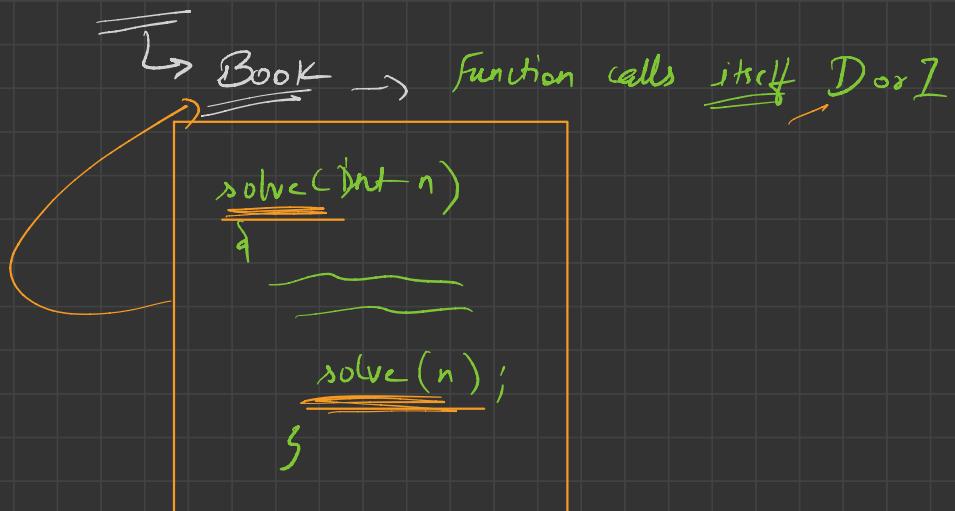



Recursion

→ what → ?



⇒ Big / complex problem ka solution
same type chotti problem
Recursion

E_X

$$2^n \rightarrow$$

$$2^4 = 2 \times \underbrace{2 \times 2}_{\downarrow} \times \overbrace{2 \times 2}^1$$
$$\Rightarrow 2 \times 2^3$$

$$2^4 = 2 \times \underline{2^3}$$

$$2^4 = 2 \times 2^3$$

$$2^3 = 2 \times \underline{2^2}$$

$$2^2 = 2 \times \underline{2^1}$$

$$2^n = 2 \times 2^{n-1}$$

$$2^1 = 2 \times \underline{2^0}$$

Recursive
Relation

$$f(n) = 2 \times f(n-1)$$

return

base
case / condⁿ

①

Factorial

$$5! = 5 \times 4 \times 3 \times \underbrace{2 \times 1}_{\downarrow}$$

$$= 5 \times 4!$$

$$5! = 5 \times 4! \rightarrow 5! = 5 \times \underline{4!}$$

$$n! = n \times (n-1)!$$

$$f(n) = n \times f(n-1)$$

Big

chart

$$5! = 5 \times \underline{\underline{4!}}$$

$$4! = 4 \times \underline{\underline{3!}}$$

$$3! = 3 \times \underline{\underline{2!}}$$

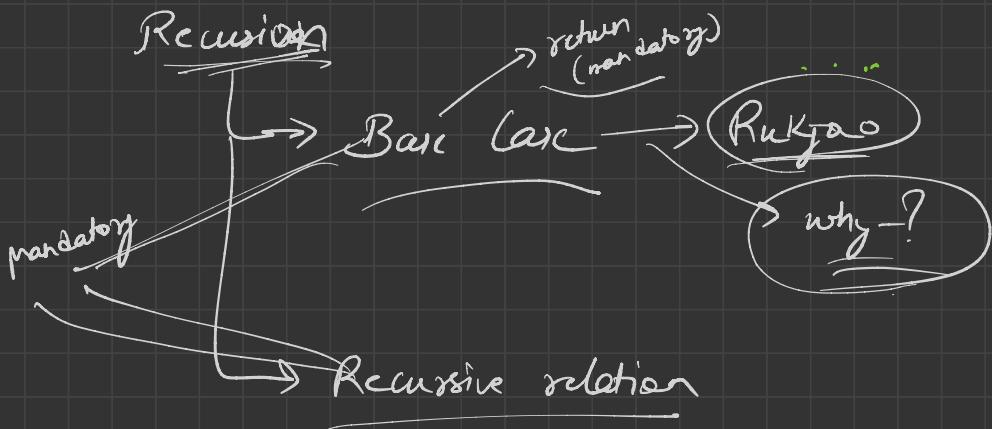
$$2! = 2 \times \underline{\underline{1!}}$$

$$1! = 1 \times \boxed{0!}$$

OK

rank 0

base
cond

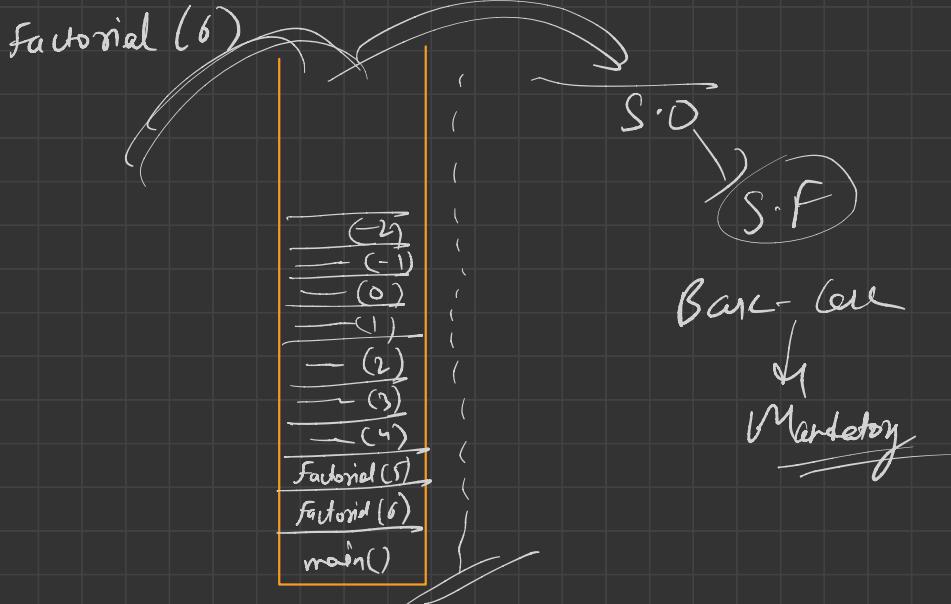


Base Case → No → S.F

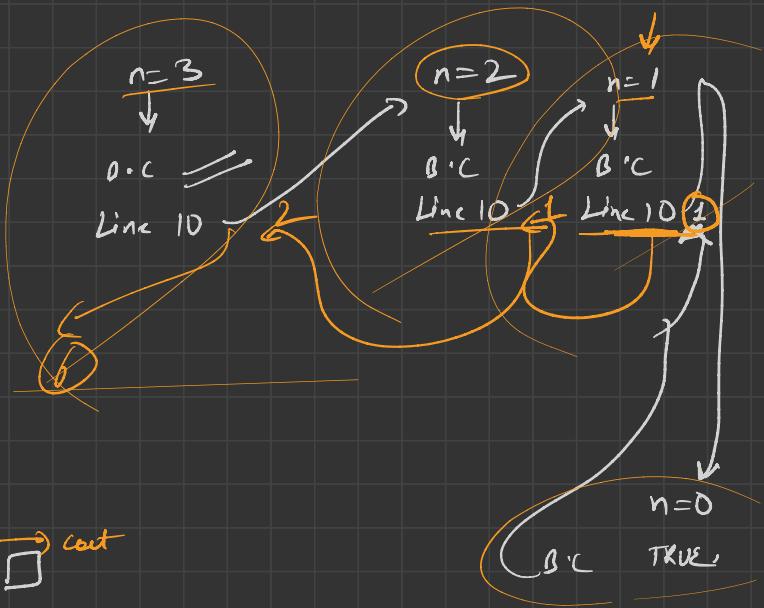
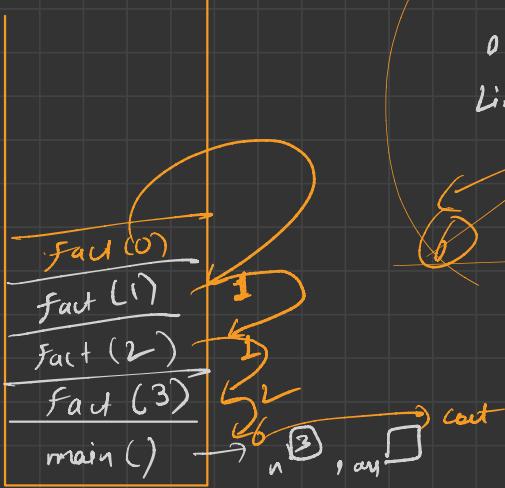
YU
↓
Rukjao Keh
hai

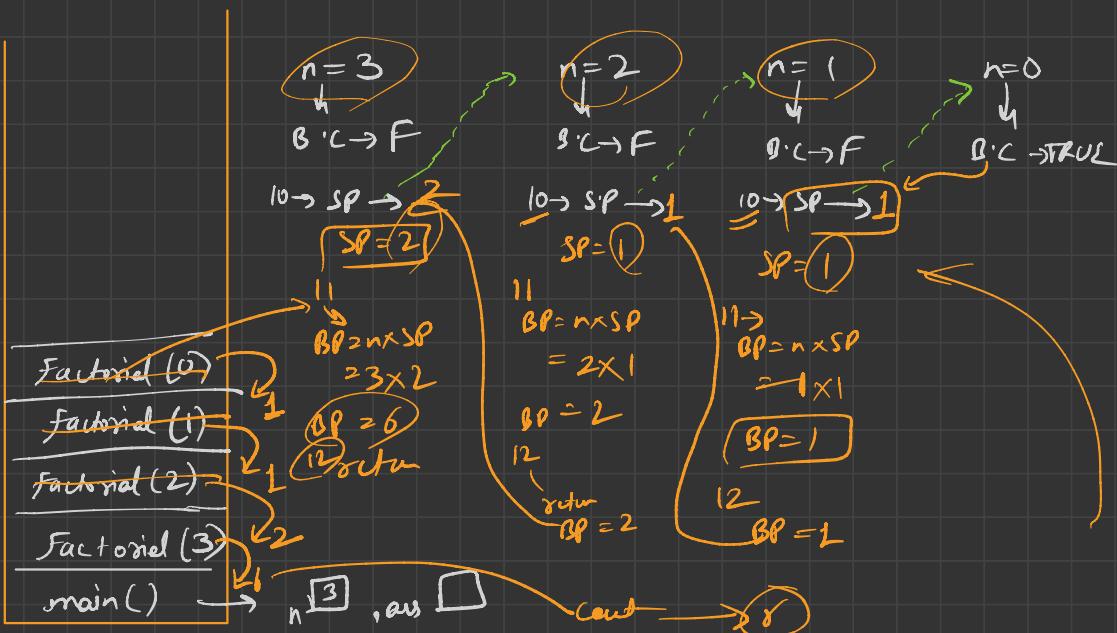
Factorial (6)
5
↓

4
3
2
1
0
-1
-2

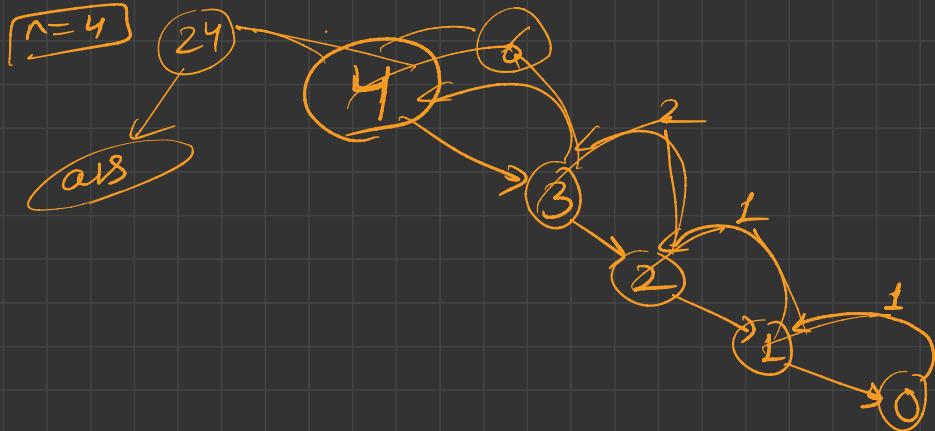


Factorial (3)
↳ call stack

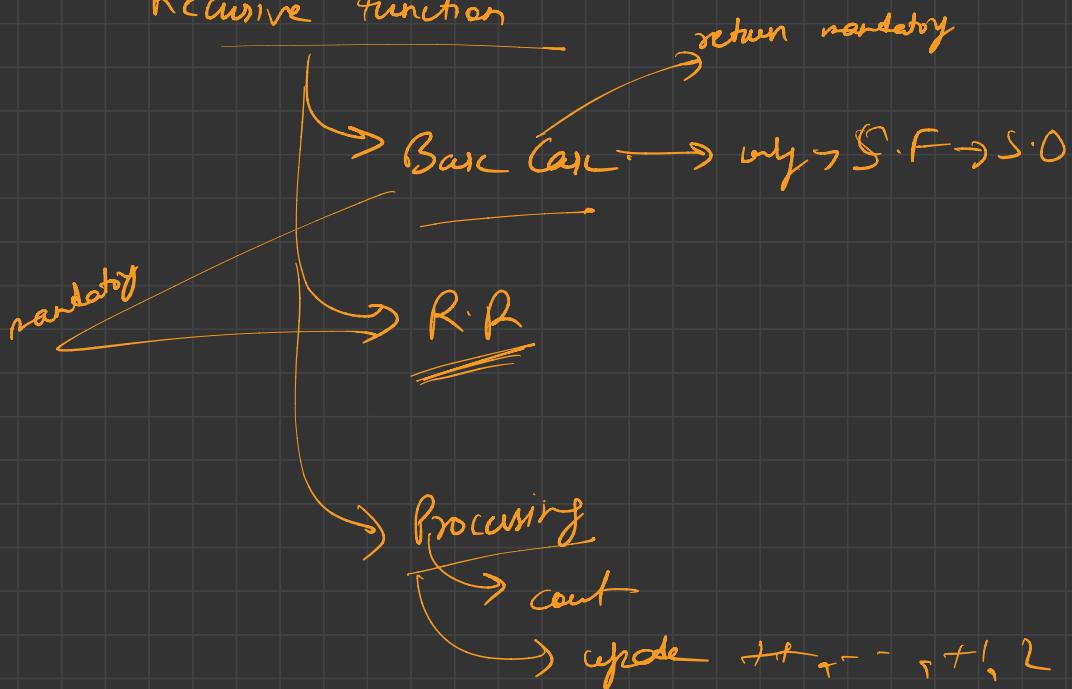




Recursion Tree



Recursive function



func ()

{

 [Base Case]

Tail
Recursion

 [Processing]

 [R.R]

}

func ()

{

 [Base Case]

 [R.R]

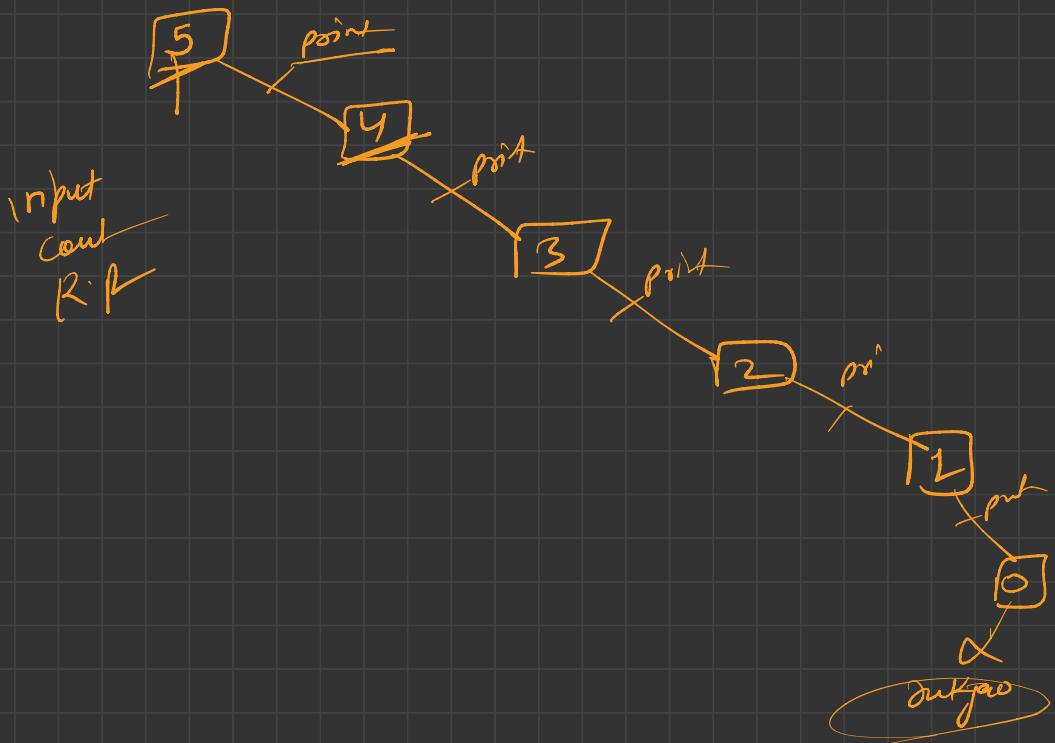
 [Head
 Recursion]

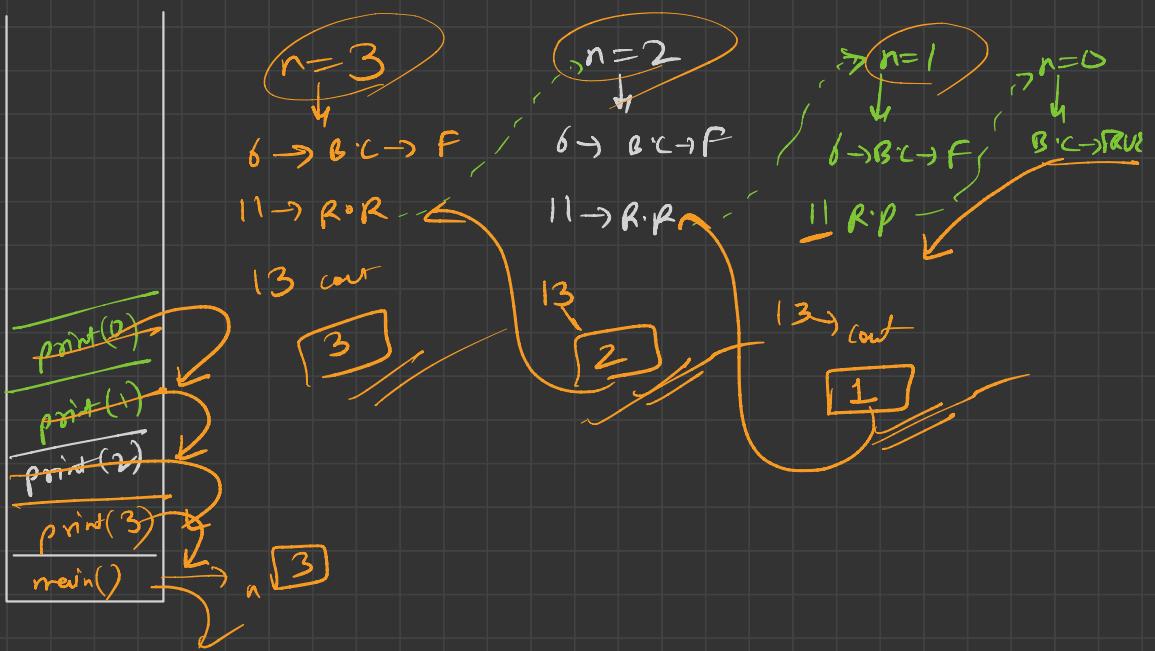
}

Point Counting :-

$$i/p \rightarrow n = \underline{\underline{5}}$$

o/p $\rightarrow 5 \ 4 \ 3 \ 2 \ L$





Recursive Tree :-

