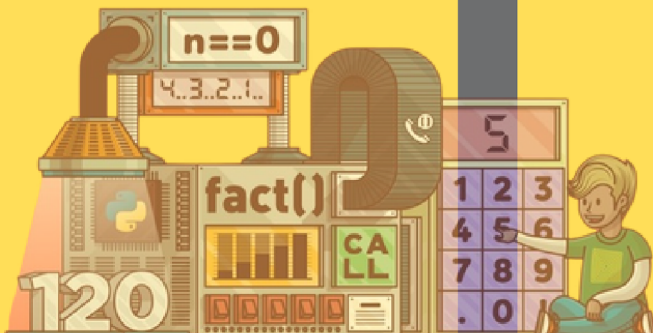
Follow

Data Structure & algorithm

Recursion-1

#Vale_freeContent

SWIPE



Recursion

Recursion is a programing concept where a function calls itself in order to solve a problem.

↳ it's like solving a big problem by breaking it down into smaller, similar problems.

in short, ↘

Recusion → function calling function itself.

ex →
```
def func():
    func()
```

Recursion Steps :-

Recursion follow 3 Step

1. Base condition / Termination condition :- Whenever we are writtin the any recursive call we have to insure that at some at of the time it should stop. it Should terminate because if it keep on going it will take all the memory.

2. Logic :- We have to solve the problem so we need a good logic, by using this we solve the problem.

3. **Recursive call (call the function again)** ⇒ We have to call the function again and that is called "Recursive call".

→ Every recursive problem that could be solved by using these three steps.

For ex →

SI → 0, 1, 2, 3

```python
# print the arr = [1,2,3,4] by using Recursion function.
def printRec(arr,sI):          # sI = starting index

    #Base condition
    if sI >= len(arr):
        return

    # Logic
    print(arr[sI])

    # Recursive call
    printRec(arr, sI+1)

# Driver code
printRec([1,2,3,4], 0)
```

```
1
2
3
4
```

↳ printRec([1,2,3,4],0)

1st step ⇒ arr = [1,2,3,4], SI = 0
↳ Base case don't execute
Print → 1 (Logic)

(Recursive call)
↳ 2nd step ⇒ arr = [1,2,3,4], SI = 1
↳ Base case don't execute
Print → 2

(Recursive call)
↳ 3rd step ⇒ arr = [1,2,3,4], SI = 2
↳ Base don't execute
print → 3

after hitting the Base condition it came back and execute the termination function. and the loop stop → executing

(Recursive call)
↳ 4th step → arr = [1,2,3,4], SI = 3
↳ Base don't execute
Print → 4

(Recursive call)
↳ 5th step → arr = [1,2,3,4], SI = 4
↳ Base condition hit
⇒ Now it terminate

Recursion ⇒ Bi-Direction

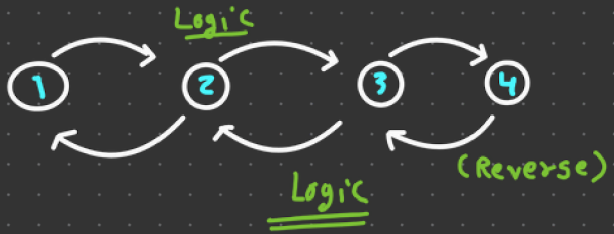
↳ In for loop / while loop → run 1 Direction → Done
↓
logic write → 1 time

ex → For/while → 

⇒ Done

↳ In case of Recursion → loop run → 2 Direction
↓
logic → 2 times

ex →



* Recursion Function →

Base condition
↓
logic
↓
Recursive call

⇒

logic apply
↓
while going
(before)

* Recursion Function →

Base condition
↓
Recursive call
↓
logic

⇒

logic apply
↓
while returning
(after)