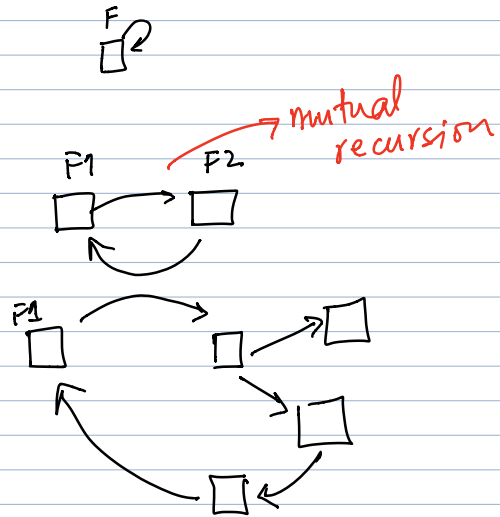


Recursion

— "Function calling itself"



$$5! = \underbrace{5 \times}_{\substack{\uparrow \\ \text{fact}(n) \\ \downarrow \\ \text{op}}} 4! \quad \substack{\uparrow \\ \text{fact}(n-1)}$$

recursive definition

→ $\text{fact}(n) = n \times \text{fact}(n-1)$

Case 1 : Stopping condition
"Base case"

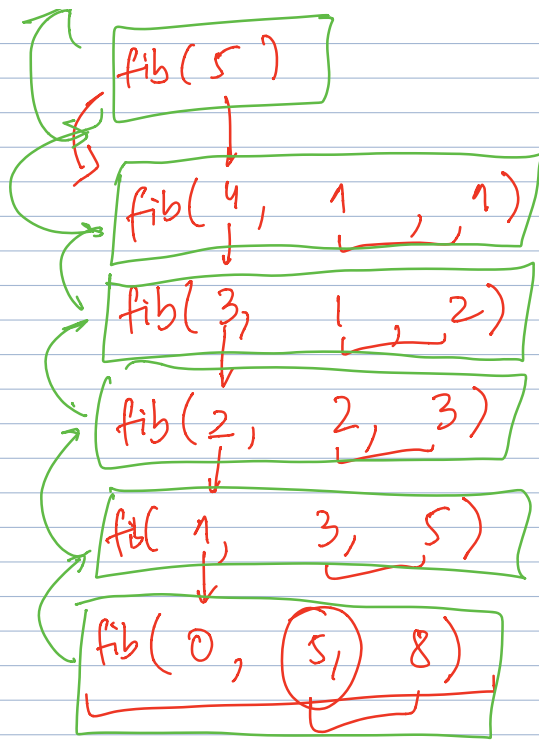


Case 2 : "Induction"

" $n+1 > n$ "

Base : $0+1 > 0$ ✓

"Induction": $\left[\begin{array}{l} "n+1 > n \rightarrow" \\ \rightarrow "(n+1)+1 > n+1" \end{array} \right]$



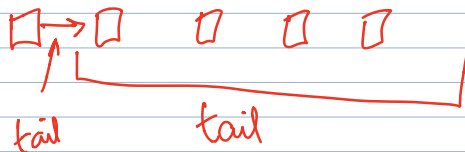
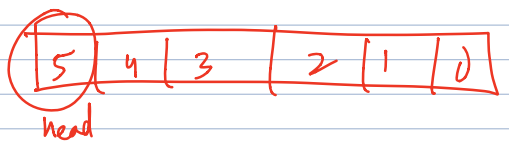
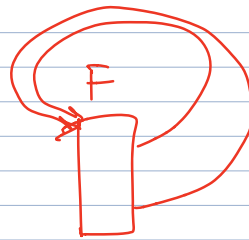
$a=0, b=1$

$a=1 \quad b=1$

loop n times

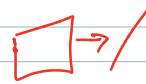
$a=b$

$b=a+b$




$\text{head} + \text{sum}(\text{tail})$

$\text{sum}[]$



↑
head

if  empty list: return 0
if one-node:

$\text{head} + \text{sum}(\text{tail})$
↑