

ek baar daam kara } question  
back recursion

question: - reversing an array

size-i-1

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vector<int> arr;

Diagram illustrating the recursive call for reversing a string:

```
graph TD
    A["revers(i+1, n)"] --> B["n -> 0"]
```

Diagram illustrating the recursive call stack for  $\text{sum}(n \rightarrow 1)$ :

- Top call:  $\text{sum}(n \rightarrow 1)$
- Second call:  $\text{sum}(10)$  (with  $10$  boxed)
- Third call:  $\text{sum}(9)$  (with  $9$  boxed and  $9 \rightarrow 1$  circled)
- Bottom call:  $\text{sum}$  (with  $9 \rightarrow 1$  circled)

Arrows indicate the flow of the recursive calls from top to bottom.

reverse(1, arr) → 1 → end reverse  
reverse(2, arr) → 2 → end reverse

recursive

sum(10)

return  $\frac{10 + \text{sum}(a)}{9} \rightarrow 1$

```
reverse(i, arr)
{ if (i <= arr.size() / 2)
```

```
→ swap(arr[i], arr[size-i]);
→ reverse(i+1, arr);
```

int length

--	--	--	--	--	--

0 1 2 3 4 5

$\frac{6}{2} = 3$

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*pattu*

1	2	3	4	5
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*Svetu*

1 2 3 4 1

$f(0, arr)$   
 base (if not)  $\rightarrow$  return  
 $\rightarrow f(0, arr)$   
 $\{ f(4, arr);$   
 $\}$

f(int index, arr,

Diagram illustrating the recursive process for calculating  $f(4)$ . The sequence of function calls is shown as  $f(0)$ ,  $f(1)$ ,  $f(2)$ ,  $f(3)$ , and  $f(4)$ . Arrows indicate the flow of the recursive calls, starting from  $f(4)$  and moving down to  $f(0)$ . A return arrow points from  $f(0)$  back up to  $f(4)$ . The final result is shown as  $f(4) = 24$ .

Diagram illustrating the addition of two numbers,  $a$  and  $b$ , using a carry chain:

- Initial values:  $a$  and  $b$ .
- Step 1:  $c = a + b$  (Carry out of the first stage).
- Step 2:  $c = a + b$  (Carry into the second stage).
- Step 3:  $c = a + b$  (Carry into the third stage).

[illegible]

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A hand-drawn diagram illustrating a for loop. It shows a rectangular box containing an oval. Inside the oval, the text "for (" is written on the left and "a sum" is written on the right, connected by a horizontal line with an arrow pointing from left to right. An arrow points down into the top of the box.

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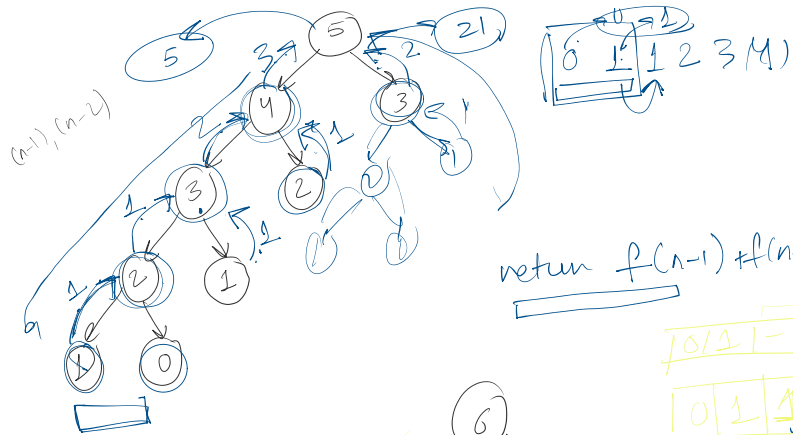
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0 1 2



$1+2=$   
 $n=0, n=1$   
 $n=0, n=1$   
 $0+0 \rightarrow 1$   
 $f(n) = f(n-1) + f(n-2)$   
 $f(5) = f(4) + f(3)$

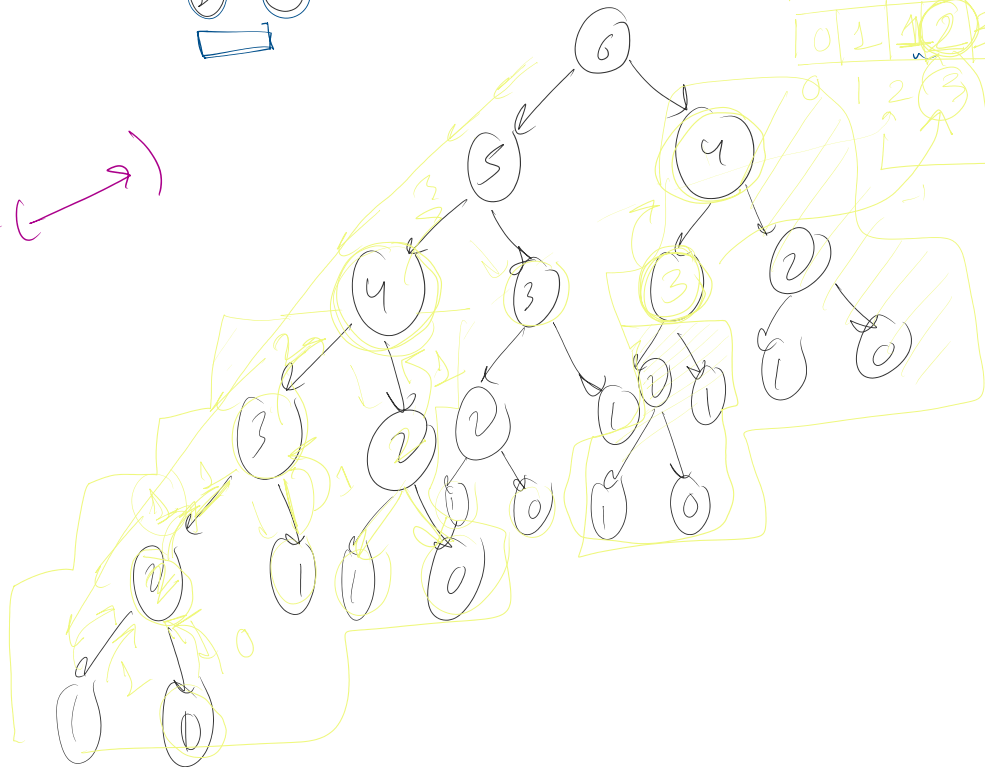
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return  $f(n-1) + f(n-2)$

0	1	-	-	-	-	-	-
0	1	1	2	3	5	8	13
0	1	2	3	5	8	13	21

for ( ← )



dynamic programming

