

n → 4

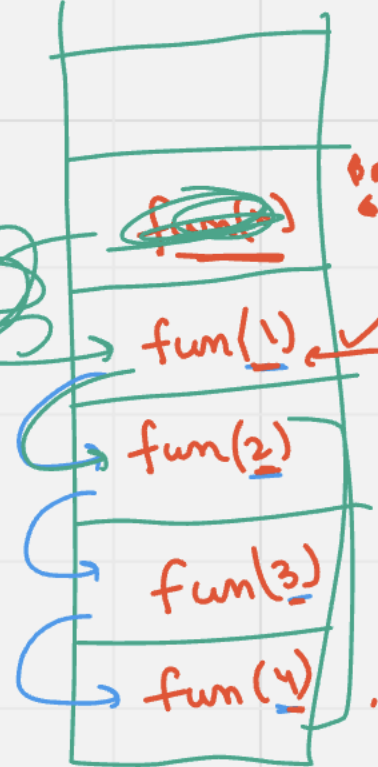
```
static void fun(int n) {
```

```
    if(n == 0) {  
        return;  
    }
```

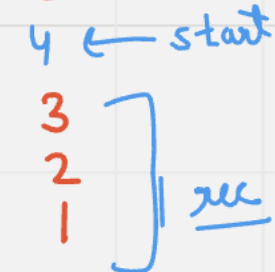
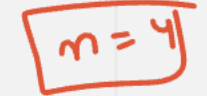
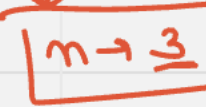
```
    fun(n-1);
```

```
    System.out.println(n);  
}
```

1
2
3
4

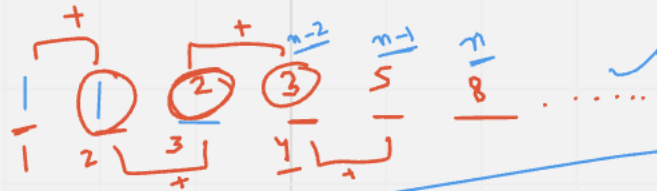


Print



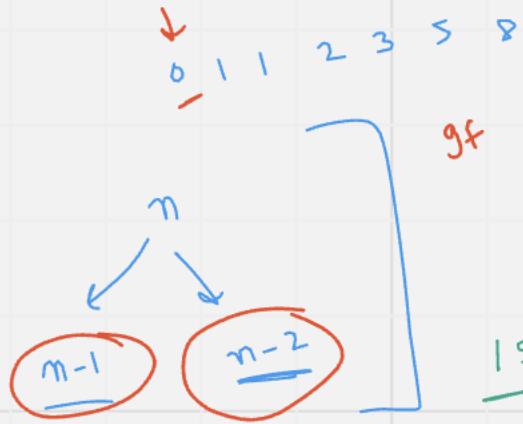
my ans

fibonacci



$$\text{fib}(n) = \text{fib}(n-1) + \text{fib}(n-2)$$

$$\text{fib}(4) = \text{fib}(3) + \text{fib}(2) = 2 + 1 = 3$$

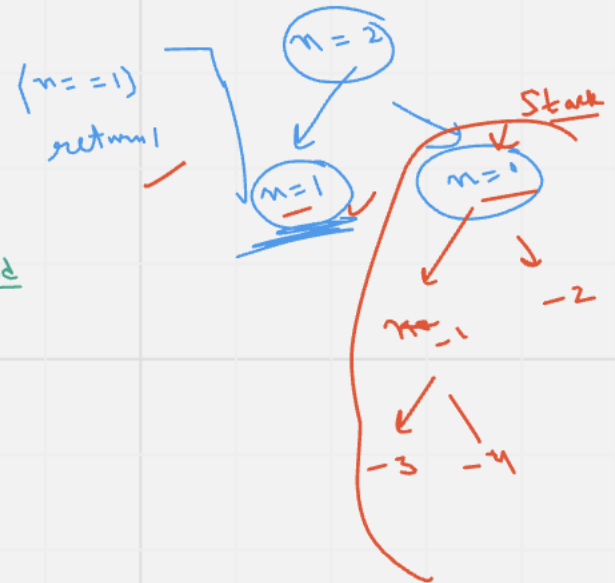
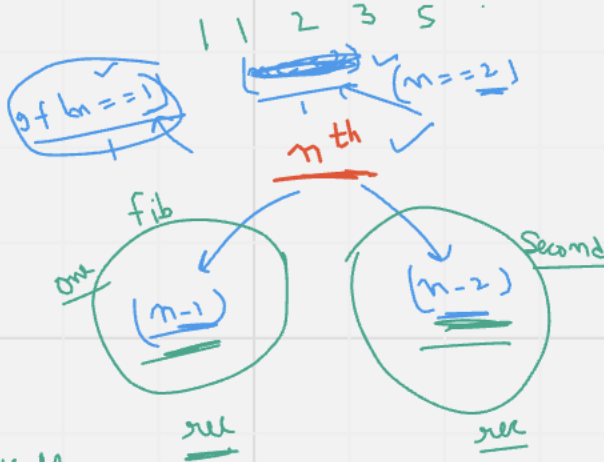


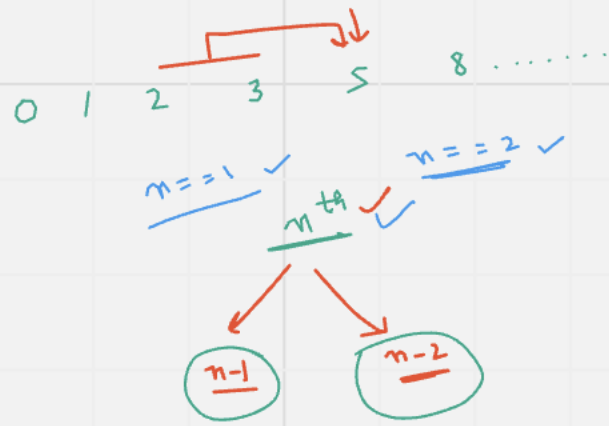
gf ($n == 1$)
return $\rightarrow 0$

15 minutes

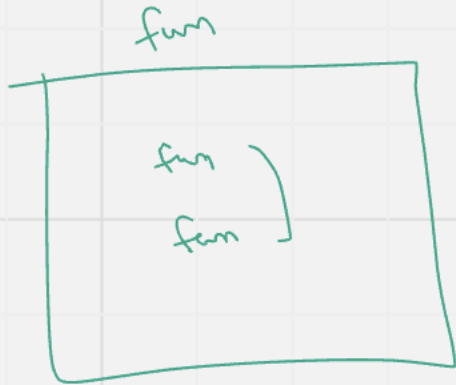
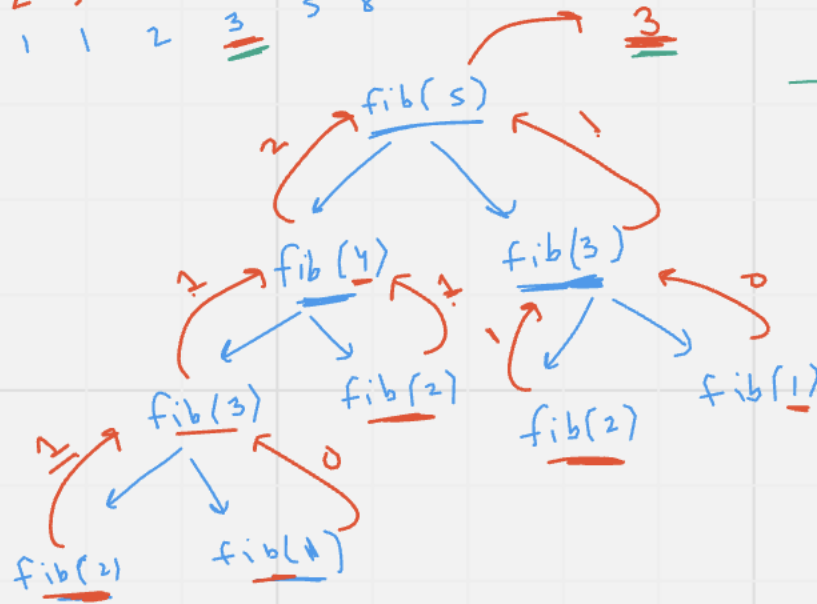


Stack overflow

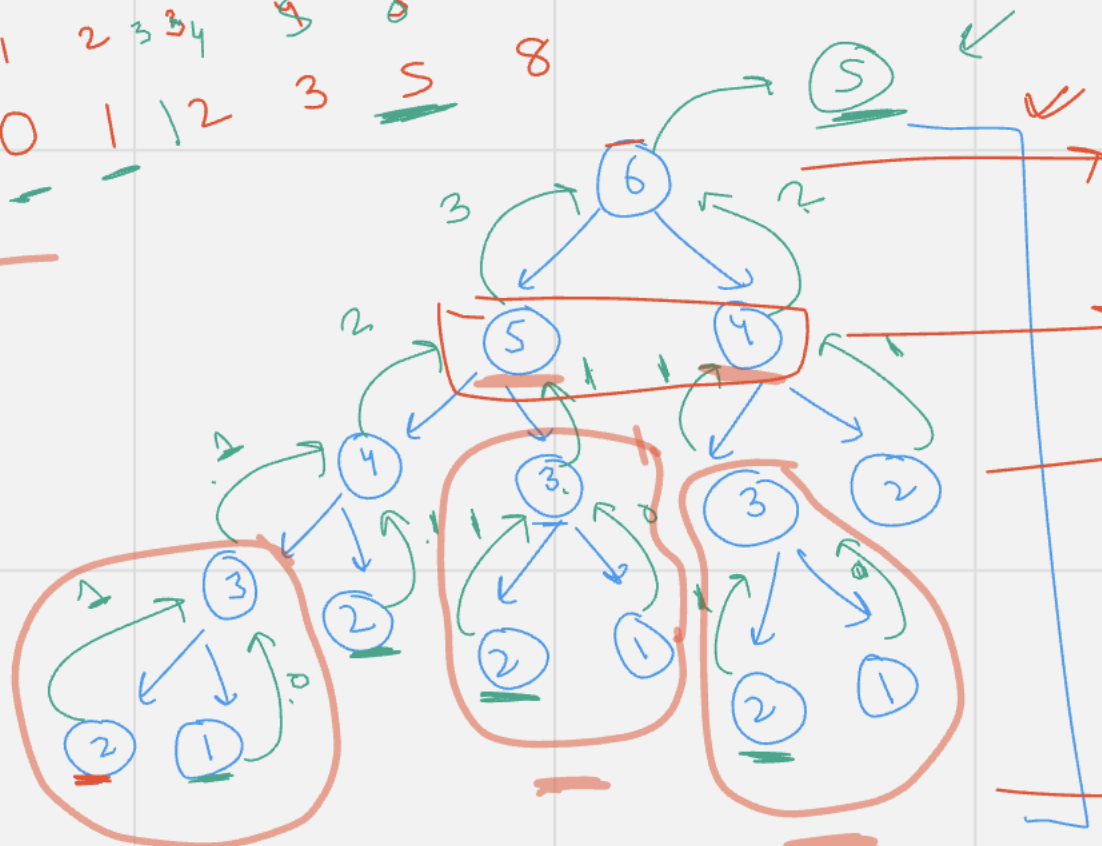




$$\text{fib}(n) = \text{fib}(n-1) + \text{fib}(n-2)$$



$O(2^n)$
 1 2 3 4 5 6 7 8
 0 1 2 3 5 8



Time Complexity

1	→	1	2^0
2	→	2	2^1
3	→	4	2^2
			\vdots
			2^{k+1}
			2^k

again how

opt $k+1$

dynamic Program

$$2^0$$

$$1 + 2 + 4 + 8 \dots + 2^k$$

kth

(n) ←

g.p

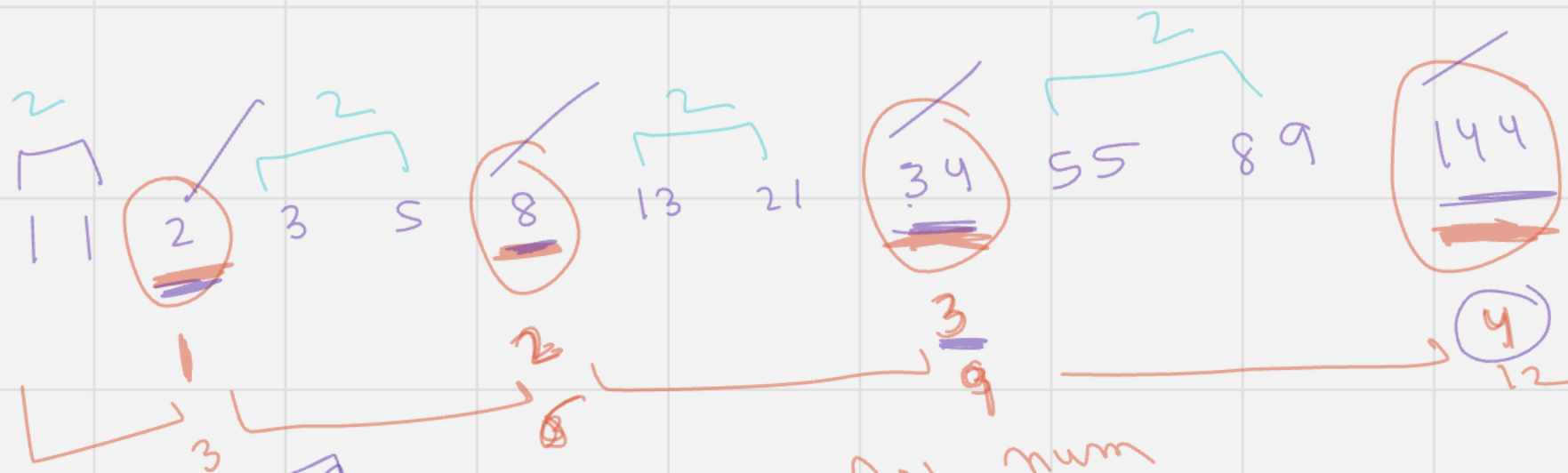
$$1 + 2^1 + 2^2 + 2^3 + \dots + 2^k$$

Sum of g.p \Rightarrow $x \rightarrow 2$

$$\frac{a (x^n - 1)}{x - 1} \equiv \frac{1 (2^k - 1)}{2 - 1}$$

2ⁿ

$$\frac{2^k}{2} \equiv \frac{2^n}{2}$$



$$4 \rightarrow 4 \times \overset{3}{(n-1)} + \overset{2}{(n-2)}$$

$$4 \rightarrow 4 + 34 + 8$$

$$\rightarrow 138 + 8$$

$$O(2^n) \rightarrow \textcircled{144}$$

$$\text{nth} \rightarrow 4 \times \overset{2}{(n-1)} + (n-2)$$

$$3 = \frac{4 \times 8}{32 + 2}$$

$$= 34$$

nth even
 4th even
 3th even

fib num

fib $\rightarrow 3 \times 4 = \overset{\text{fib}}{12}$

$\rightarrow 3 \times 3 \rightarrow 9$

20th even

$\rightarrow 20 \times 3 \rightarrow \underline{\underline{60}}$

X

$$153 \div 10 \rightarrow 3$$

$$0 \rightarrow 9$$

$$ans \% 10 \rightarrow 10^9 + 7$$

prime unique

$$Int \checkmark \quad 1 \quad 1 \quad 2 \quad 3 \quad 5 \quad 8$$

$$-2^{31} \leftrightarrow 2^{31} - 1$$

Int

$$fib(20) = 2^{34}$$

= value

$$Num \% 10$$

range of out

[0 9]

$$2^{34} \div 10^9 + 7$$

Int

$$1 \quad 1 \quad 2 \quad 3 \quad 5 \quad 8 \quad \dots \quad 34 \quad \dots$$

$$sf(n=1) \quad 2 \quad \bigg/ \quad (n=2) \quad 8$$

H.W

Prac 1 Practice

with 10 min