"Those who can't remember their past, are condemned to repeat it"

dp lec 1 L1
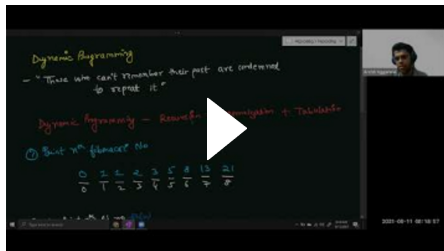
Q1 Nth fibonacci Number

$$0 \quad 1 \quad 1 \quad 2 \quad 3 \quad 5 \quad 8 \quad 13 \quad 21$$

$$\uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow$$

$$0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8$$

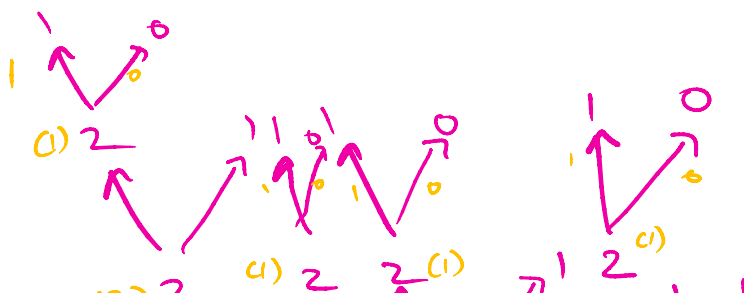## Using Recursion

① Expectation $f(n) = $ Nth fibonacci number

$f(6) = 8$
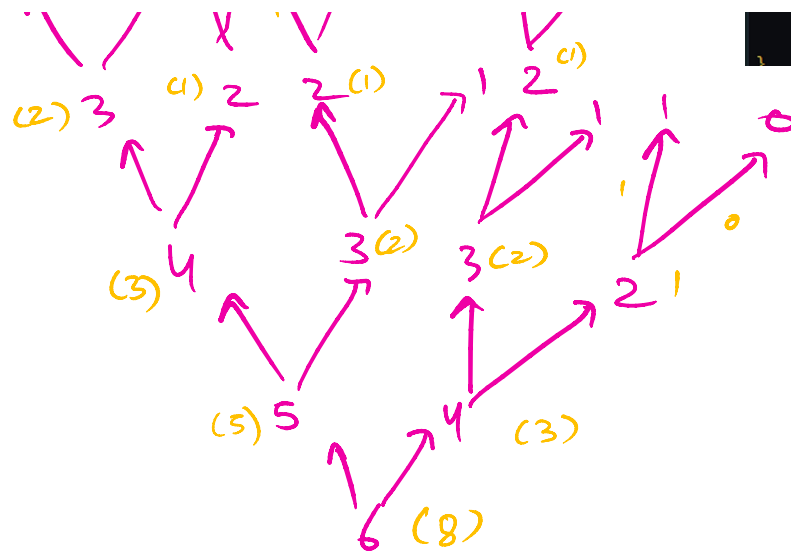
② faith $f(n-1) \rightarrow$ (N-1)th fibonacci Number

$f(n-2) \rightarrow$ (N-2)th fibonacci Number

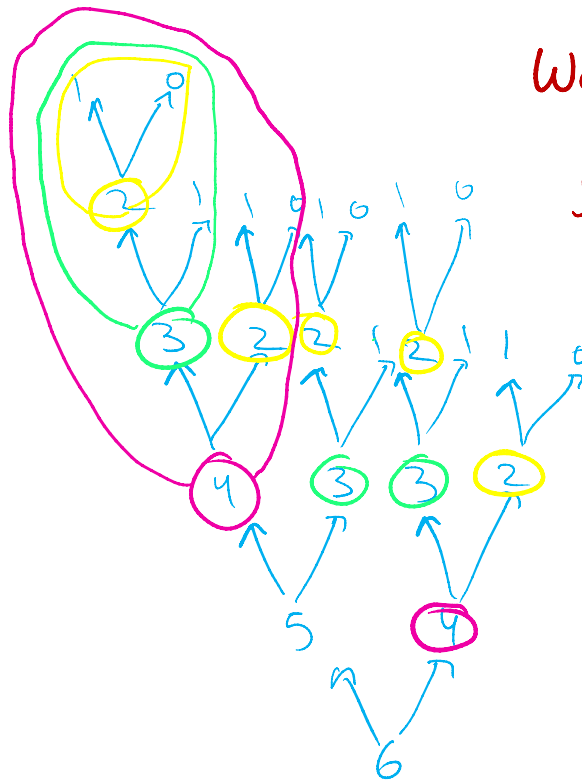③ Meeting Expectation from faith

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

```java
public static int fib(int n) {
    if(n == 0 || n == 1) {
        return n;
    }

    return fib(n-1) + fib(n-2);
}
```

```
return fib(n-1) + fib(n-2);
```

(2) 3   (1) 2   2 (1)   1   2 (1)   1   1   0

(3) 4   3 (2)   3 (2)   2   1   1   0

(5) 5   4   (3)

6   (8)

We have a lot of repetitive calls in this recursion tree.

1   0
2
3   2   2   2   1   1   0
4   3   3   2
5   4
6