Fibonacci Sequence & Dynamic Programming

Fibonacci sequence:
$$f(n) = f(n-1) + f(n-2)$$
, $n > 2$ with $f(2) = f(1) = 1$

Dynamic Programming = Recursion + Memorization

```
1 def fib(n):
2    if n <= 2: return 1
3     return fib(n - 1) + fib(n - 2)</pre>
```

Recursion in $\mathcal{O}(2^n)$

```
1 def fib(n):
2    memo = {1: 1, 2 : 1}
3    def f(n):
4         if n in memo:
5             return memo[n]
6             memo[n] = f(n - 1) + f(n - 2)
7             return memo[n]
8    return f(n)
```

Recursion + Memorization in $\mathcal{O}(n)$

Thanks for your attention!

Any Questions?

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