Roadmap of Recursion

Fibonacci Series

$n = 0$ to 6

n = 0	n = 1	n = 2				
0	1	2	3	4	5	6
0	1	1	2	3	5	8

function name $f(n)$

$fib(n)$: $T(n)$

$f(n) = n$ $\quad n <= 1$ —— Case 1

$f(n) = fib(n-1) + fib(n-2)$ $\quad n > 1$ —— Case 2

$f(2) = f(1) + f(0)$

$= 1 + 0 = 1$

↳ Recursion

⇓

1) Lesser lines of code

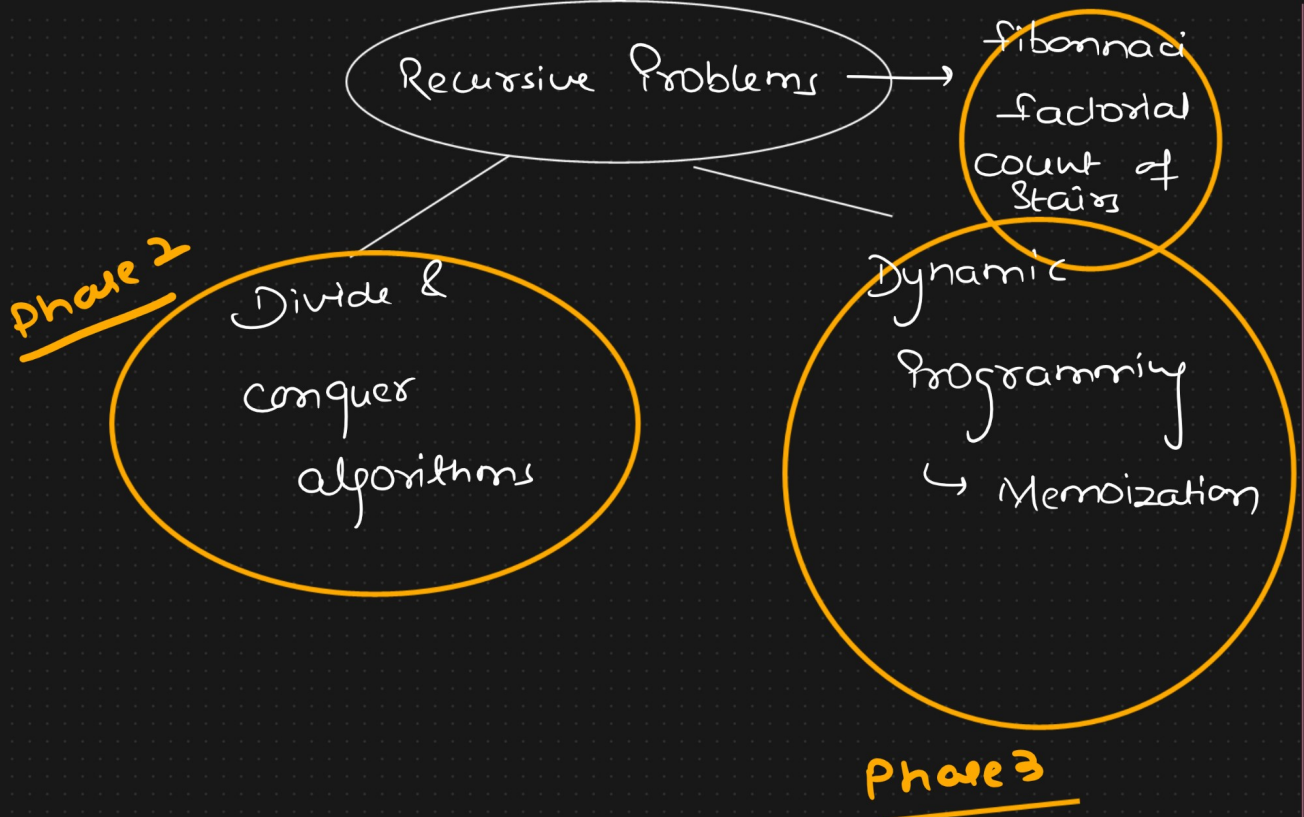
applications of Divide & conquer algo

↳ Recursive Tree → MergeSort, QuickSort

↳ Recurrence Relation → Substitution, Recursive Tree, Master's Theorem

$$T(n) = \begin{cases} c & n <= 1 \\ T(n-1) + T(n-2) & n > 1 \end{cases}$$

Phase 1


Recursive Problems
fibonnaci
factorial
count of stairs
Phase 2
Divide & conquer algorithms
Dynamic Programming
↳ Memoization
Phase 3