Dynamic Programming

* Not a Silver bullet.

Solving Complex problem → Breaking them into Smaller Sub-Problems

In DP
- ↳ Solve each Sub-problem just once.
  - ↳ Store result in table (array, matrix or variable).
  - ↳ Avoid Re-Computation.

Types of DP

→ Each author will give their own type 😀

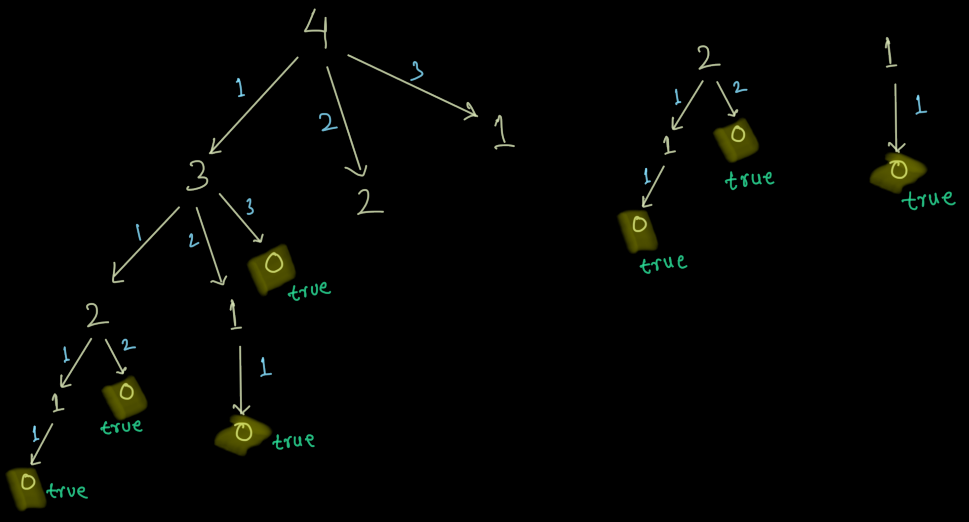
→ Top-Down with memorization
- Break problem at the top
- Recursive → with table to store result

→ Bottom-Up with Tabulation
- Consider smallest problem first.
- Solutions are typically built iteratively and are stored in a table (array).
- Iterative + tabled or stored.

Coin Sum problem

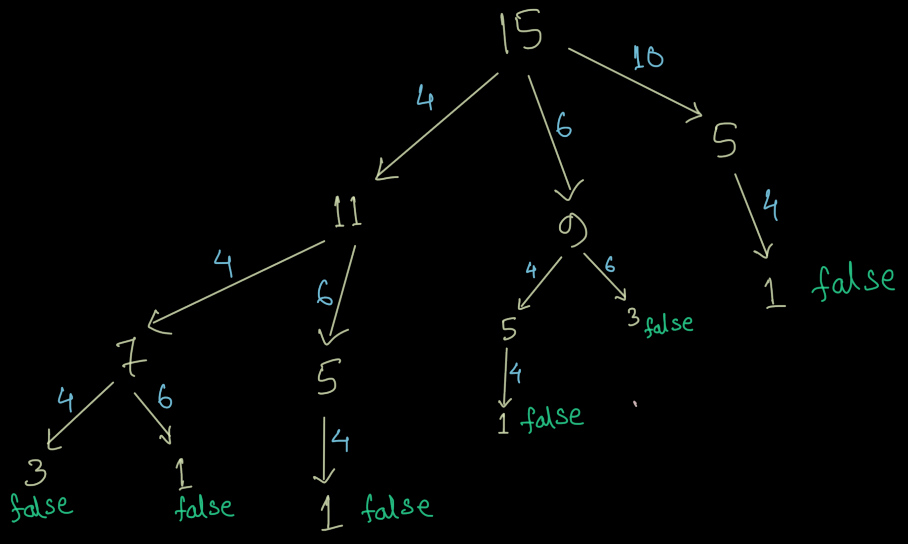
target amount → Amount → 4

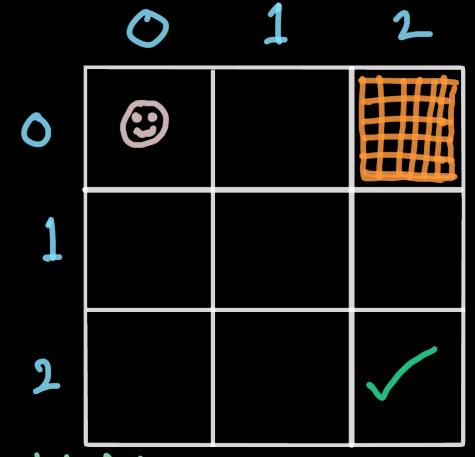
nums [1, 2, 3]



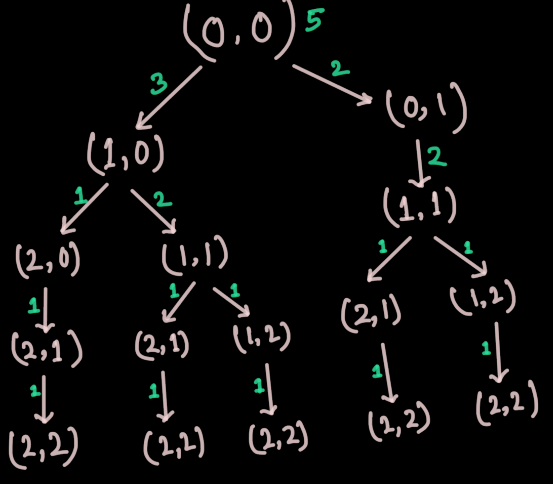
Amount = 15

nums [4, 6, 10]





→ You are at (0,0) & you have to go to (2,2)
→ You can only go right & down & you can't go to (0,2)



⇒ House Robber (Non Adjacent)

→ 2, 7, 9, 3, 1 these are the adjacent house no.
→ You can't choose adjacent house & do the robbery otherwise there will be "Challe on your back 💀"