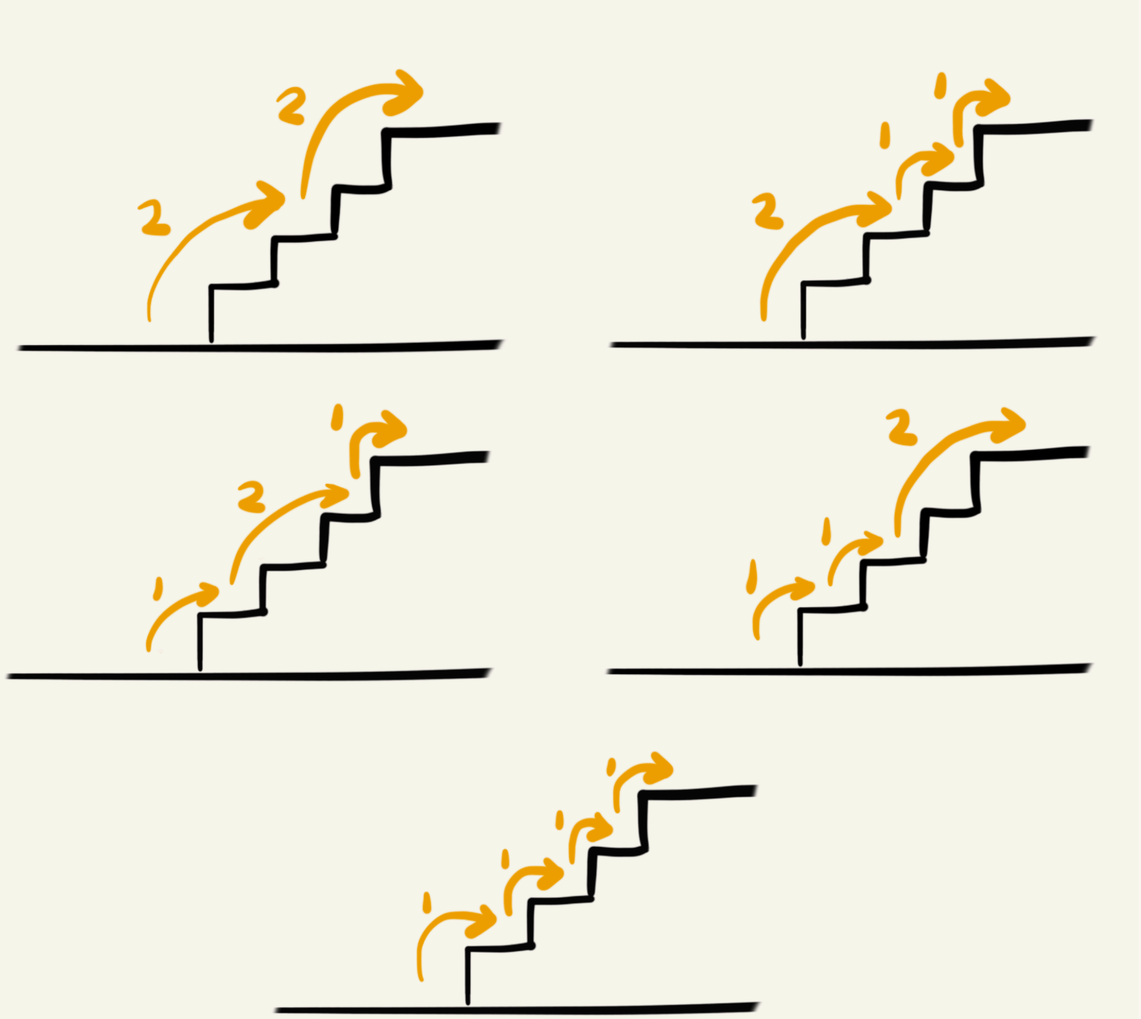
Climbing Stairs Problem

You are climbing a staircase that consists of n steps.

You can only climb 1 or 2 steps at a time. How many distinct ways can you climb to the top?

Example

If n = 4, there are 5 distinct ways to climb the stairs.

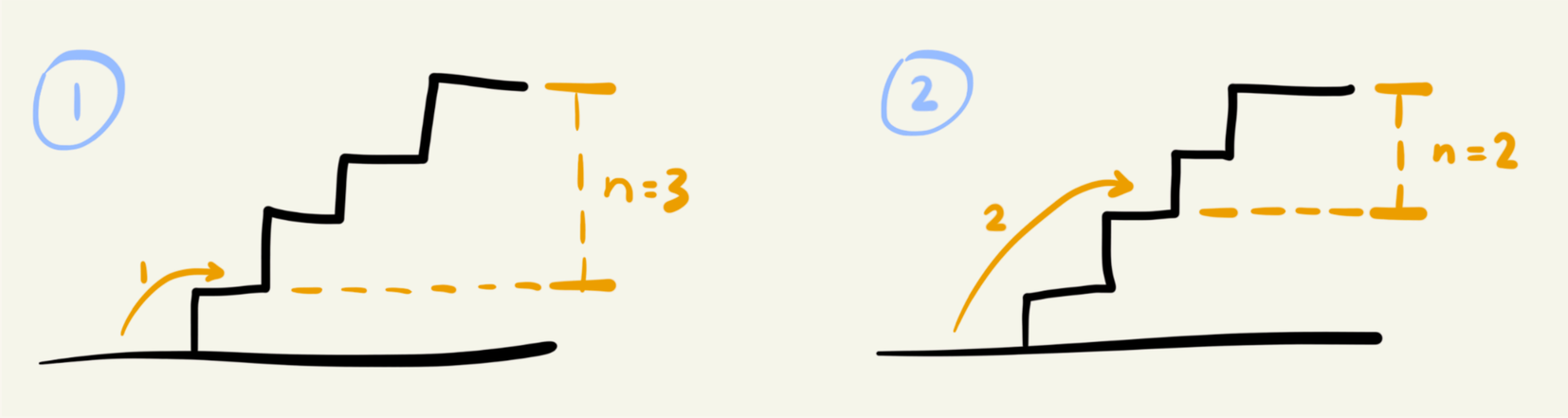


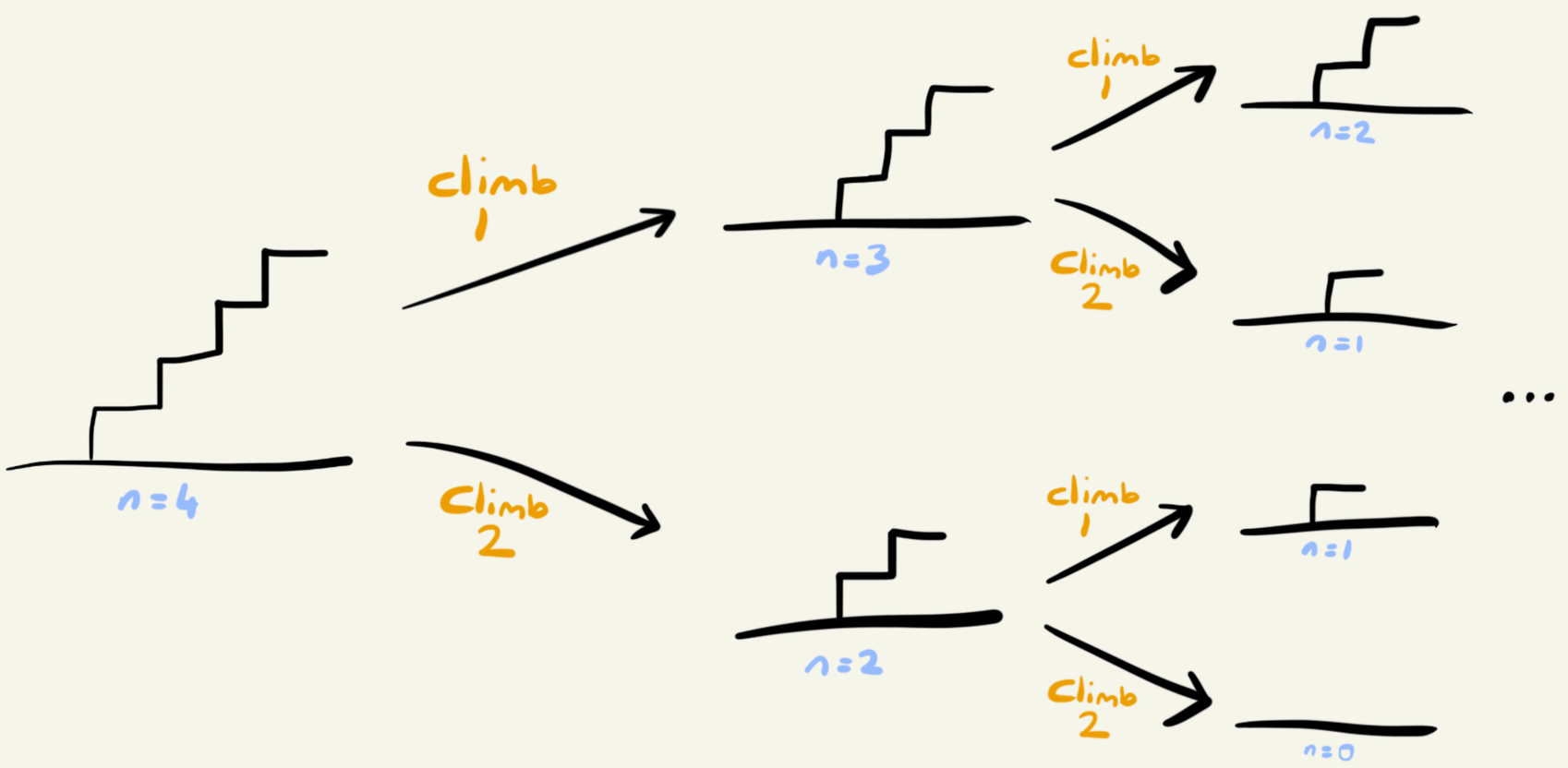
Analysis

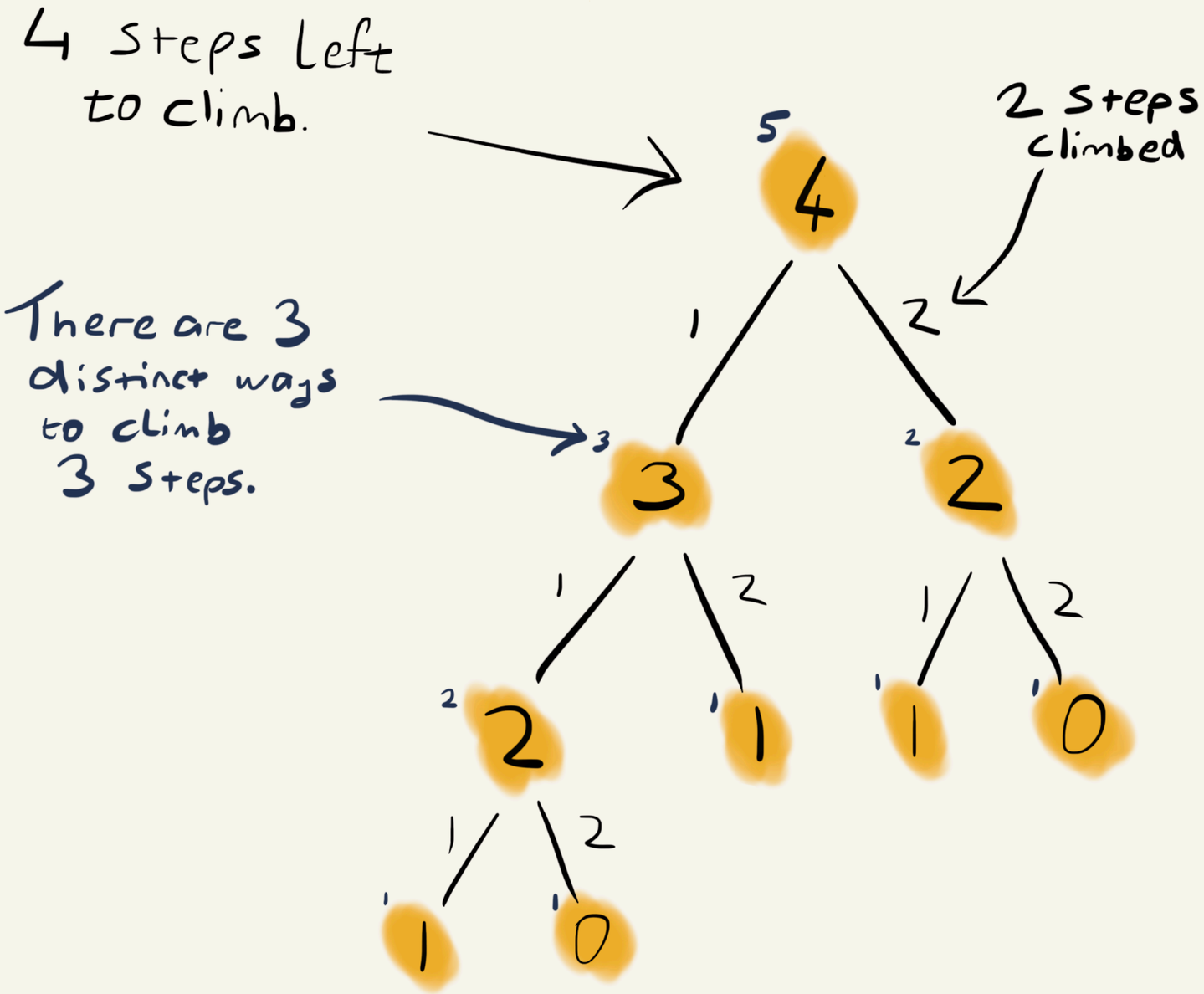
If we are at the bottom of the stairs, we have 2 options:

1. Climb 1 stair
2. Climb 2 stairs

Whichever option we choose, we will be left with a smaller version of the original problem.







Recursion Tree

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

$$f(0) = 1$$

$$f(1) = 1$$