

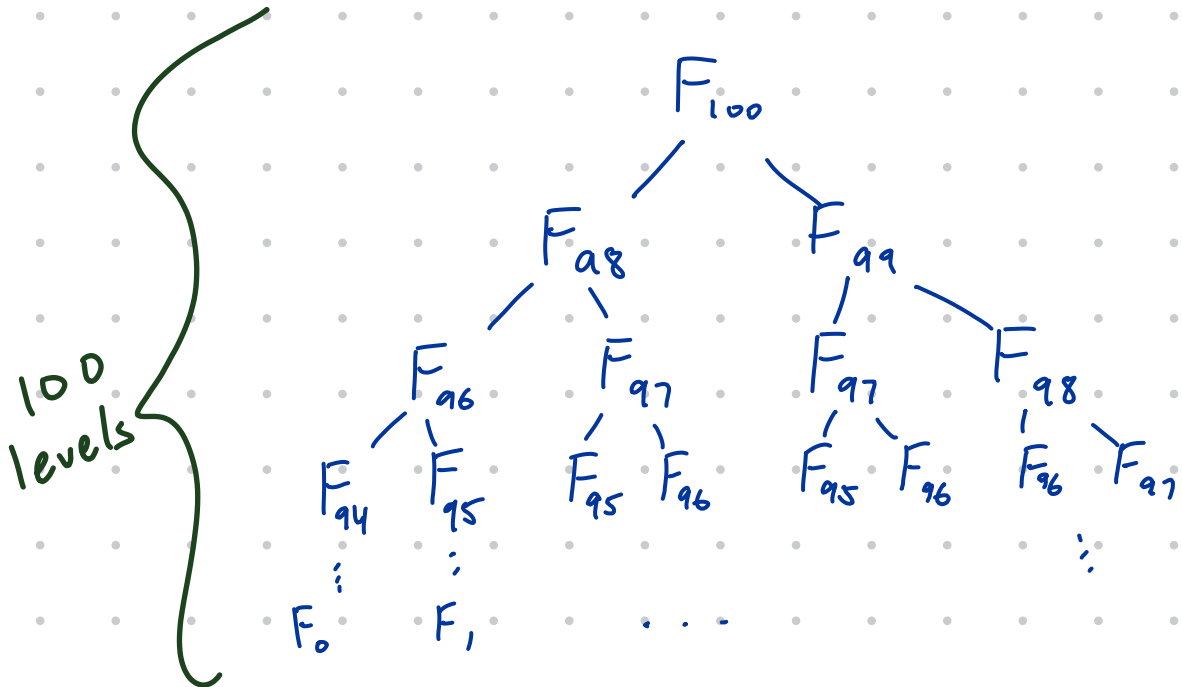
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FIBONACCI SEQUENCE

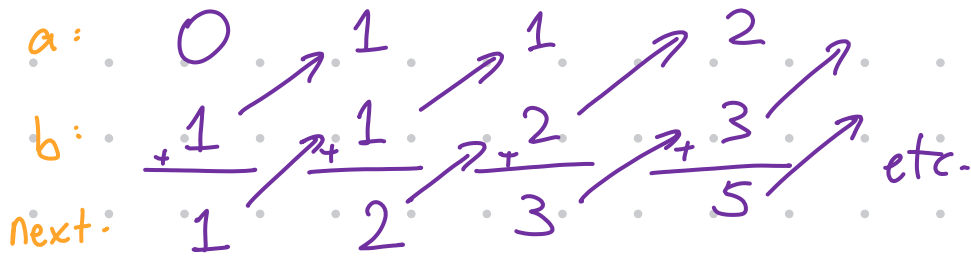
0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, ...
 $F_0, F_1, F_2, F_3, F_4, \dots$

Formal Definition: Let $F_0 = 0, F_1 = 1,$ base cases

and $F_n = F_{n-1} + F_{n-2}$ for integers $n > 1$
recursive definition



← 2^{100} terms
 $\approx 10^{30}$



ALGORITHM: Compute $Fib(n)$

INPUT: nonnegative integer n
(index of F_n to compute)

INITIALIZE: $a=0, b=1$ base case

MAIN LOOP: for k from 2 to n :

Set $next = a + b$ compute F_k

Set $a = b$ and $b = next$. shift values

RETURN: $F_n = next$