

For  $x_0 = 0, x_1 = 1$

def rec-fib( $x_n$ ):

if  $x_n \leq 1$ :

return  $x_n$

else:

return (rec-fib( $x_n-1$ ) + rec-fib( $x_n-2$ ))

— 0 —

	0	1	1	2	3	5	8	13	21	34	55
$x_n \rightarrow$	0	1	2	3	4	5	6	7	8	9	10

(i)  $x_n = 2 > 1$

$$\begin{array}{c} \downarrow \text{rec-fib}(2) \\ \text{rec-fib}(1) + \text{rec-fib}(0) \\ \downarrow \quad \uparrow \quad \downarrow \quad \uparrow \\ 1 \quad 2-1 \quad 0 \quad 2-2 = 1 \end{array}$$

(ii)  $x_n = 3 > 1$

$$\begin{array}{c} \text{rec-fib}(3) \\ \downarrow \\ \text{rec-fib}(2) + \text{rec-fib}(1) \\ \downarrow \quad \uparrow \quad \downarrow \quad \uparrow \\ 1+0 \quad 3-1 \quad 1 \quad 3-2 = 2 \end{array}$$

(iii)  $x_n = 4 > 1$

$$\begin{array}{c} \text{rec-fib}(4) \\ \downarrow \\ \text{rec-fib}(3) + \text{rec-fib}(2) \\ \downarrow \quad \uparrow \quad \downarrow \quad \uparrow \\ 1+0+1 \quad 4-1 \quad 1+0 \quad 4-2 = 3 \end{array}$$

(iv)  $x_n = 5 > 1$

$$\begin{array}{c} \text{rec-fib}(5) \\ \downarrow \\ \text{rec-fib}(4) + \text{rec-fib}(3) \\ \downarrow \quad \downarrow \\ 1+0+1+1+0 \quad + \quad 1+0+1 = 5 \end{array}$$

(v)  $x_n = 6 > 1$

$$\begin{array}{c} \text{rec-fib}(6) \\ \downarrow \\ \text{rec-fib}(5) + \text{rec-fib}(4) \\ \downarrow \quad \uparrow \quad \downarrow \quad \uparrow \\ 1+0+1+1+0+1+0+1 \quad 6-1 \quad 1+0+1+1+0 \quad 6-2 = 8 \end{array}$$

(vi)  $x_n = 7 > 1$

$$\begin{array}{c} \text{rec-fib}(7) \\ \downarrow \\ \text{rec-fib}(6) + \text{rec-fib}(5) \\ \downarrow \quad \downarrow \\ 8 \quad + \quad 5 = 13 \end{array}$$