



Computing Fibonacci numbers

Bottom-up:

- Compute $F_0, F_1, F_2, \dots, F_n$ in order, forming each number by summing the two previous.
- Running time: $\Theta(n)$.

Naive recursive squaring:

$F_n = \phi^n / \sqrt{5}$ rounded to the nearest integer.

- Recursive squaring: $\Theta(\lg n)$ time.
- This method is unreliable, since floating-point arithmetic is prone to round-off errors.