

The Master theorem (CLRS pg 94). Let $T : \mathbb{N} \rightarrow \mathbb{N}$ be defined by the recurrence

$$T(n) = aT\left(\frac{n}{b}\right) + f(n)$$

where $a \geq 1$ and $b > 1$.

- ▶ If $f(n) = O(n^{\log_b a - \epsilon})$ for some $\epsilon > 0$, then $T(n) = \Theta(n^{\log_b a})$
- ▶ If $f(n) = \Theta(n^{\log_b a})$ for some $\epsilon > 0$, then $T(n) = \Theta(n^{\log_b a} \lg n)$
- ▶ If $f(n) = \Omega(n^{\log_b a + \epsilon})$ for some $\epsilon > 0$ and $a \cdot f\left(\frac{n}{b}\right) = O(f(n))$, then $T(n) = \Theta(f(n))$