

# Master Theorem

Reference: Chapter 4.

For a positive function  $T$ , if for some  $a \geq 1, b > 1, d \geq 0$ :

$$T(n) = aT(n/b) + \Theta(n^d)$$

then

$$T(n) = \begin{cases} \Theta(n^d) & \text{if } a < b^d \\ \Theta(n^d \log(n)) & \text{if } a = b^d \\ \Theta(n^{\log_b(a)}) & \text{if } a > b^d \end{cases}$$