

CS341 Notes

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1 Asymptotic Notation and Recurrences

1.1 master method

$$T(n) = aT\left(\frac{n}{b}\right) + O(n^d)$$

a = #recursive calls, $a > 1$

b = input size shrinkage factor($b > 1$)

d exponent in the runtime $d > 0$

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