~~Karatsuba(12, 34, 2)~~

$n = 1$

$12 = 10^1$ $a = 1$, $b = 2$, $c = 3$, ~~$d = 4$~~

Recap

Selection Sort $O(n^2)$

Merge Sort $O(n \cdot \log_2 n)$ from $T(n) = 2 \cdot T(n/2) + Cn$

Correctness of Mergesort? Lecture #5

Integer Multiplication w/ Karatsuba $O(n^{1.59}) > O(n^2)$ ← original

MASTER THEOREM for divide & conquer algos

$T(n) = a \cdot T(n/b) + Cn^d$

if $\frac{a}{b^d} > 1 \rightarrow T(n) = \Theta(n^{\log_b a})$

$= 1 \longrightarrow \Theta(n^d \log n)$

$< 1 \longrightarrow \Theta(n^d)$

$(2-1)(3-4)$

-1

Binary Search $O(\log n)$

18 7 3 10 | 11 6 14 20

3 7 10 18 6 11 14 20

F

BM

$O(n)$

$a = 16$ $b = 4$ $d = 1$

$\frac{16}{4^1} = 4$

$n^{\log_4 16}$