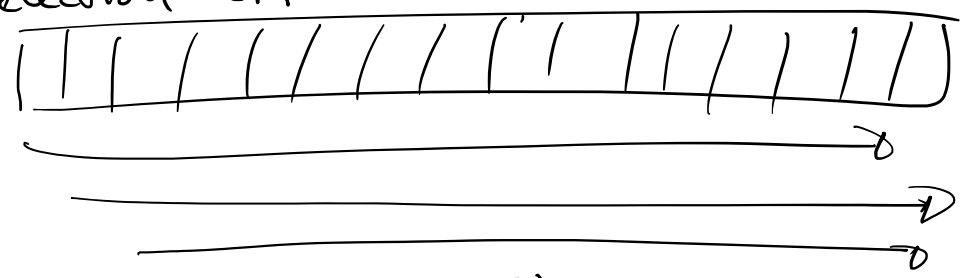
Informatik II - Klausuren

Freitag, 22. Juli 2016 14:05

Selection Sort



Best Case: $\Theta(n^2)$

Sel. Sort, Bubble Sort, Insertion Sort

QS, MS

Ins. Sort → vorsortiert: $\Theta(n)$

Tier → Tor

0

replace + delete

Maximum Sp. Tree

$w'(e) = C - w(e)$

$\sum_{e \in T} w'(e) = (n-1)C - \sum_{e \in T} w(e)$

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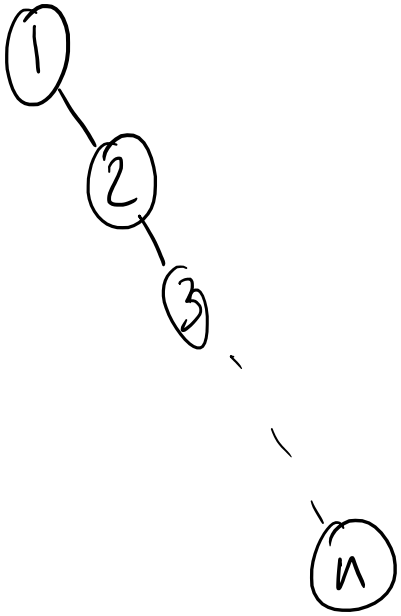
1, 2, 3, ..., 10, ..., n



$$O(f(n)) := \{ g(n) \mid \exists c > 0,\ n_0 \geq 1 \ \forall n \geq n_0 : g(n) \leq c f(n) \}$$

$$\Omega(f(n)) := \{ g(n) \mid \exists c > 0,\ n_0 \geq 1 \ \forall n \geq n_0 : g(n) \geq c f(n) \}$$

a) $\sqrt{n+7} \in O(\sqrt{n})$: korrekt

$\log(a^b) = b \cdot \log(a)$

Beweis: $c = 10$

$\sqrt{n+7} \leq 10\sqrt{n}$

$n+7 \leq 100n$ $\quad n \geq \frac{7}{99}$ $\quad n_0 = 1$

b) $\underbrace{\log(n^2)}_{=2\log(n)} \in \Omega(\log(n)^2)$

$2\log n \geq c \log^2 n$

$\frac{2}{c} \geq \log n$

$f(n) \in O(g(n))$: $f(n)$ "$\leq$" $g(n)$

$f(n) \in \Omega(g(n))$: $f(n)$ "$\geq$" $g(n)$

$f(n) \in \Omega(\log n)$, $g(n) \in O(n)$: $f(n) \in \Omega(\log(g(n)))$

$f(n)$ "$\geq$" $\log n$, $g(n)$ "$\leq$" n

~~$f(n)$ "$\geq$" $\log(g(n))$~~

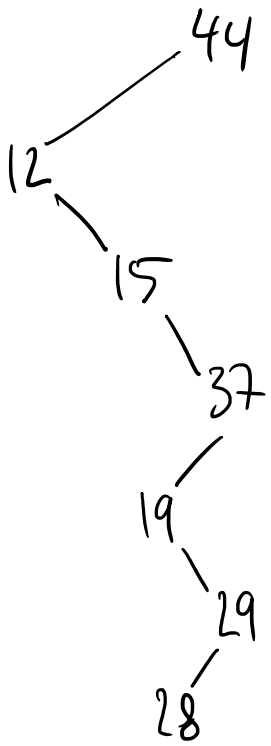
~~$\log(n)$~~ "$=$"

$f(n) = O(g(n)) + O(h(n)) + O(n^2)$

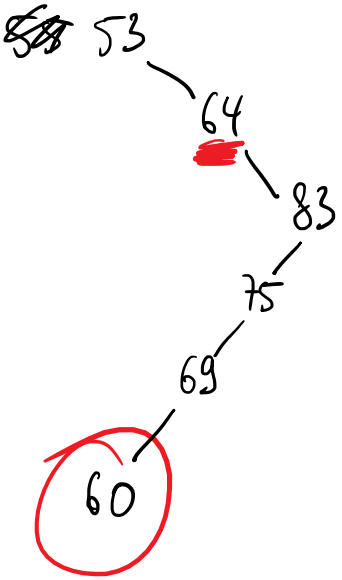
$f(n) = \Theta(n)$

$f(n) = n^2 + O(n)$

44, 12, 15, 37, 19, 29, 28



53, 64, 83, 75, 69, 60, 66



5a) Rek-gleichung

$$T(n) = 2T(n/2) + O(1)$$