

Zeilensummen

Lust sachen: $N = \# \text{ Elemente}$

Baum: $N = \# \text{ aller Knoten}$

Textsache: $N = \# \text{ Zeichen}$

$$f(N) = \{1, N, N^2, \lg(N), N \cdot \lg(N), \sqrt{N}, e^N\}$$

$$\frac{f(N)}{N} \rightarrow 0 \quad \frac{N}{\lg(N)} \rightarrow \infty \quad \frac{N^2}{e^N} \rightarrow 0 \quad \frac{\sqrt{N}}{\lg(N)} \rightarrow \infty$$

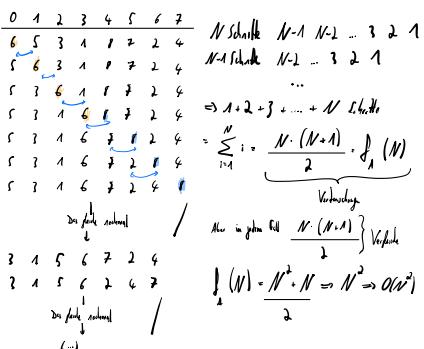
$$\frac{f(N)}{f(N)} \rightarrow c \in [0, \infty]$$

$$f_1(N) = N \cdot \lg(N) + N^2 + N$$

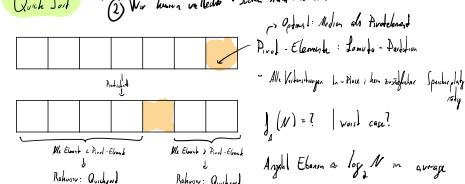
$$\frac{f_1(N)}{N} = \frac{N \cdot \lg(N) + N^2 + 2N}{N} = \lg(N) + N + 2 \rightarrow \infty$$

$$\frac{f_1(N)}{N} = \frac{N \cdot \lg(N) + N^2 + 2N}{N} = \frac{N \cdot \lg(N) + N^2}{N} + \frac{2N}{N} \rightarrow 1 + 2 \cdot O(1) \rightarrow O(1)$$

Bubble-Sort



Quicksort \rightarrow ① Wir kann von links nach rechts \rightarrow L-Daten (Θ von ①)



Worst case

$$10 \ 9 \ 8 \ 7 \ 6 \ 5 \ 4 \ 3 \ 2 \ 1$$

$$10 \ 9 \ 8 \ 7 \ 6 \ 5 \ 4 \ 3 \ 2 \ 1$$

$$1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ 9 \ 10 \rightarrow O(N^2)$$

average case:

	Prob	Value
3 4 1 9 2 10 5 8 7 6	1/10	-10
3 4 1 9 2 10 5 8 7 6	1/10	-9
3 4 1 9 2 10 5 8 7 6	1/10	-8
3 4 1 9 2 10 5 8 7 6	1/10	-7
3 4 1 9 2 10 5 8 7 6	1/10	-6
3 4 1 9 2 10 5 8 7 6	1/10	-5
3 4 1 9 2 10 5 8 7 6	1/10	-4
3 4 1 9 2 10 5 8 7 6	1/10	-3
3 4 1 9 2 10 5 8 7 6	1/10	-2

$$= O(N \cdot \lg(N))$$

$$= O(N \cdot \lg(N))$$