

Sortări Avansate

Shell sort \rightarrow Div. et Impera pt.
Insertion

\rightarrow împarte tabloul a în h subtablouri
pentru i de la 1 la h
sort. subtabloul a_i

sort. Integru tablou

h prea mic \rightarrow subtabl. prea mari
 h prea mare \rightarrow prea multe subtabl.

27 15 83 5 40 13 78 99 18 20 16
└──────────┘ └──────────┘ ↓

$\begin{pmatrix} 27 \\ 13 \\ 16 \end{pmatrix}$ 15 83 5 40
78 99 18 20

(5)

13 15 83 5 20
16 78 99 18 40
27

\rightarrow 13 15 83 5 20 - - -

(13) 15 83 (5) 20 16 (78) 99 18 (40) 27

5 20 16
78 99 18
40 27

(3) H → 5 3 1
subtabela

5 15 16
13 20 18
40 27 83
78 99

5 15 16 13 20 18 40 27 83 78 99

5 13 15 16 18 20 27 40 78 83 99

(1)

✓

H → descrescător

(ultimul
obligatoriu 1)

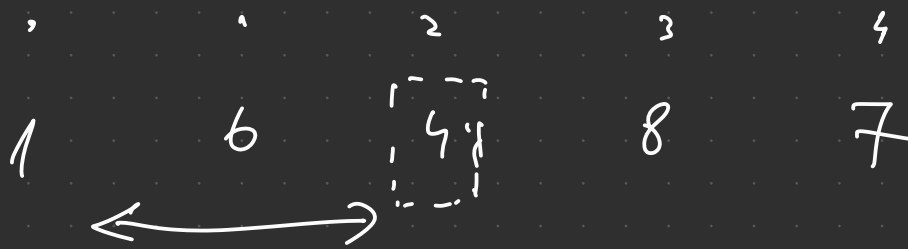
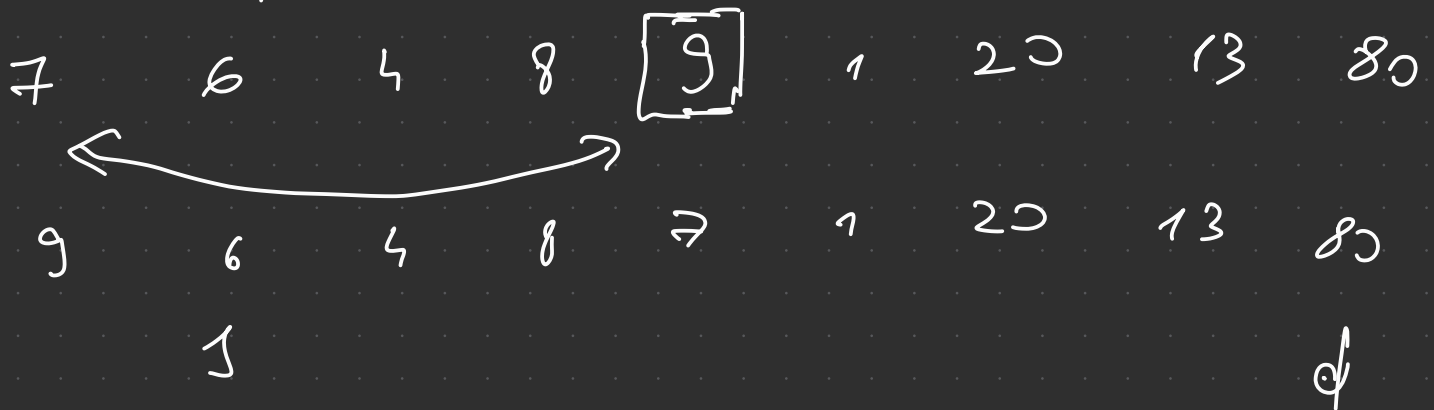
$$\rightarrow O\left(n^{\frac{5}{3}}\right) < O(n^2)$$

Quicksort

$O(n^2)$ când aleg pivotul cel mai mic / mare

$O(n \log n)$ în general

I pivot median



6^2 $\boxed{8^3}$ 7^4
 \downarrow \downarrow

$$(2+4)/2 = 3$$

8 | 6 7
 \downarrow \downarrow
 \downarrow

7 6 $\boxed{8}$
 \sim

$\boxed{7}$ 6
 \downarrow
 \downarrow

6 7

20^6 $\boxed{13^7}$ 8^8

$\downarrow \rightarrow \text{cant} >$

$\boxed{13}$ 20 80

$\downarrow \rightarrow \text{cant} <$

\downarrow \downarrow
 7 8

$\boxed{20}$ 80
 \downarrow \downarrow
 \swarrow

- eleg pivot $(s+d)/2$ (choose pivot element in subtable)



$$C_{\min} = M_{\min}$$

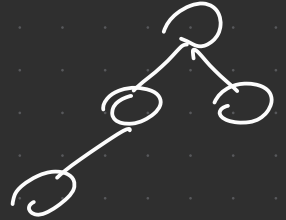
$$O(n) + 2T\left(\frac{n}{2}\right) + 4T\left(\frac{n}{4}\right) + \dots = O(n \log n)$$

↓
parcourer

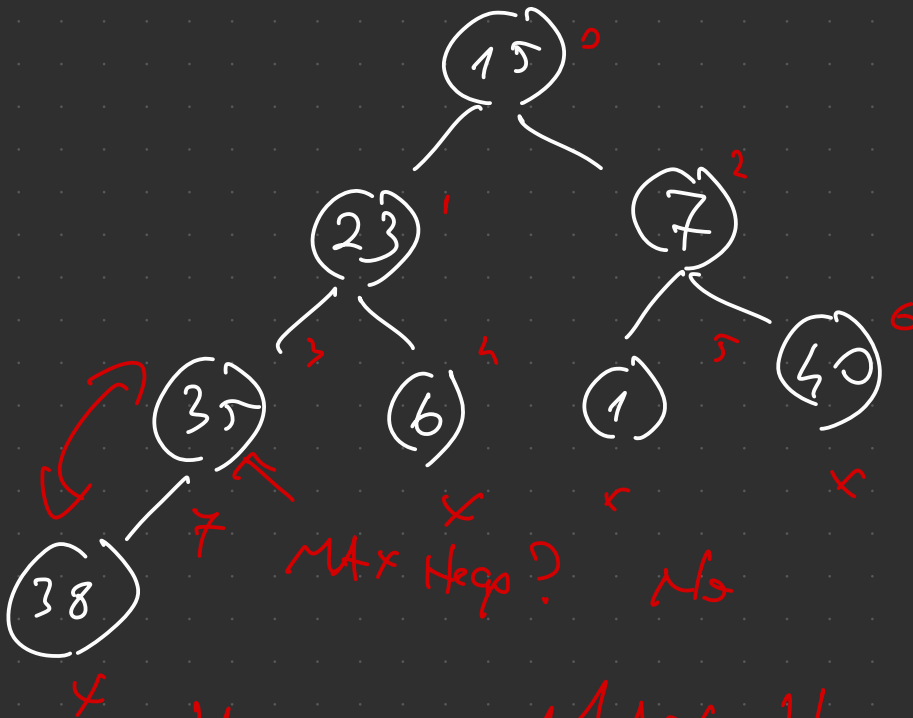
$$C_{\max} = M_{\max} = O(n^2) \quad \text{pivot val } \begin{cases} \text{max} \\ \text{min} \end{cases}$$

Heap Sort

- nu folosește recursivitatea
- se bazează pe selection sort
- bazează pe un arbore binar



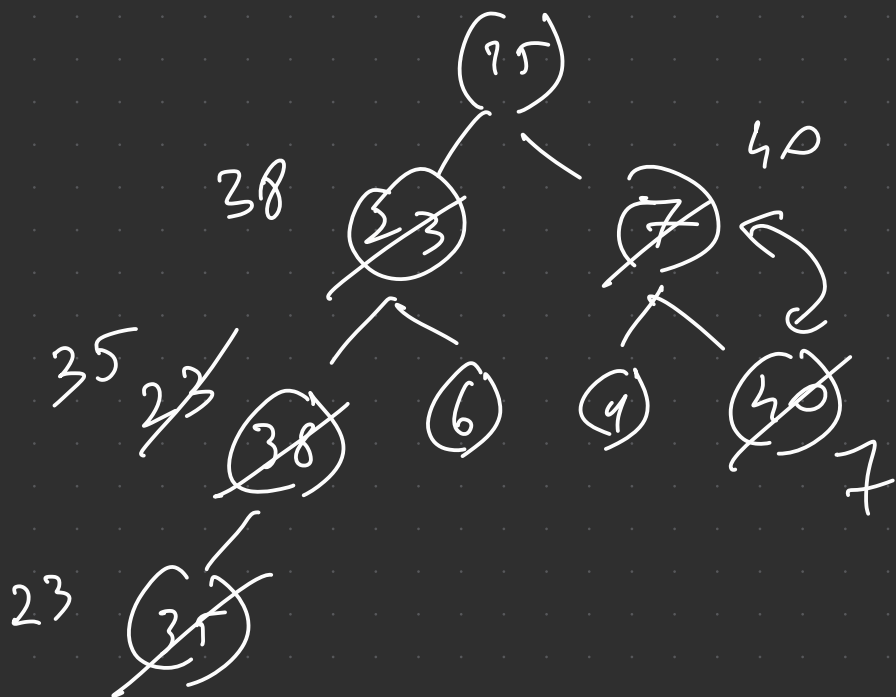
0 1 2 3 4 5 6 7
15 23 7 35 6 1 40 38



Heap - MAX Heap

$$a[i] \geq a[2i+1]$$

$$a[i] \geq a[2i+2]$$



Nodul > fiu \rightarrow swap cu max
dintre fiu

