

Kopiec

Heapsort

Podwójna kolejka priorytetowa

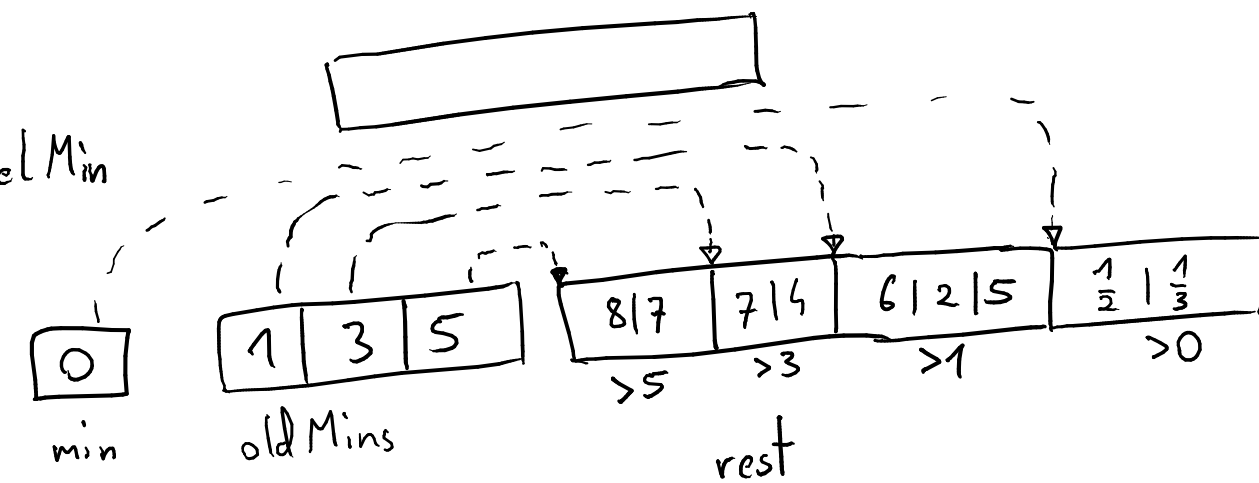
- dwa kopce ze związanymi kluczami
- dwa kopce skłonne Δ_{\min}^{\max}

Struktura, żeby:

insert: $O(1)$

deleteMin: $O(\log k)$

poprzedzających delMin



$\underline{5} \ 8 \ 7 \ \underline{3} \ 7 \ 4 \ \underline{1} \ 6 \ 2 \ 5 \ \underline{0} \ \frac{1}{2} \ \frac{1}{3}$
 $\downarrow +2$
 $\underline{7} \ 10 \ 3 \ \underline{5} \ 3 \ 6 \ \underline{3} \ 8 \ 4 \ 7 \ \underline{0} \ 2 \ 1$
 $\underline{7} \ 10 \ 3 \ 5 \ 3 \ 6 \ 3 \ 8 \ 4 \ 7 \ 0 \ 2 \ 1$

min 7
old Mins \emptyset
rest \emptyset

$\underline{7} \ 10 \ 3 \ 5 \ 3 \ 6 \ 3 \ 8 \ 4 \ 7 \ 0 \ 2 \ 1$

min 0
old Mins $10 \geq 3 \geq 7 \geq 6 \geq 5 \geq 4 \geq 3 \geq 2 \geq 1$
rest $\begin{array}{|c|c|c|} \hline 3 & 8 & 7 \\ \hline \end{array}$

$\underline{7} \ 12 \ 8 \ \overline{3 \ 11 \ 10}$

min 7
old Mins $12 \geq 8$
rest $\begin{array}{|c|c|c|} \hline 3 & 11 & 10 \\ \hline \end{array}$

$\begin{array}{c} \text{wybór} \\ \downarrow \\ \underline{7} \ 10 \ 3 \ 5 \ 3 \ 6 \ 3 \ 8 \ 4 \ 7 \ 0 \ 2 \ 1 \end{array}$
min 7
old Min
old Max
max 10

$\overline{4 \times}$

 $\underline{7} \ 10 \ 3 \ 5 \ 3 \ 6 \ 3 \ 8 \ 4 \ 7 \ 0 \ 2 \ 1$
min 5
old Min 7
dunno
old Max 3
max 10

min $3 \leq$
old Min $7 \geq 6 \geq 5$
old Max $3 \leq 3$
max $10 \geq$

$\overline{1 \ 6 \ 0 \ 7}$
 $\underline{3 \ 4 \ 2 \ 5 \ 1 \ 6 \ 0 \ 7}$

0
 $? \wedge \underline{3 \geq 2 \geq 1}$
 $\underline{4 \leq 5 \leq 6}$
7