

Choice Dictionary

Colored C.D.

$U = \{1 \dots n\}$

$S \subseteq U$

- Init
- Insert(x)
- Delete(x)
- Member(x)
- Choice
- Iterate

$O(1)$ na word-RAMu (stručka slova w)

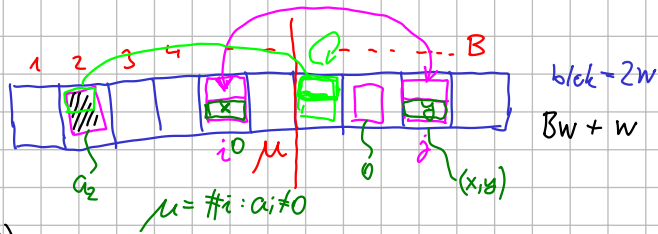
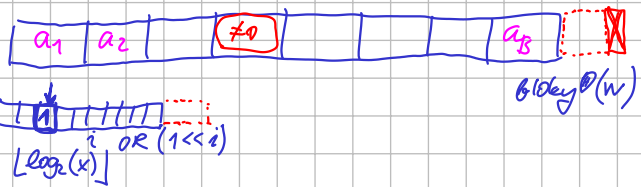
c barev 2^k
 $f: U \rightarrow [c]$
 Init: vše obarví 0
 setColor(x, q)
 GetColor(x)
 Choice(q)
 Iterate(q)

čas $O(1)$

Prostor $n \log c + O(1) + o(n)$

Prostor $n + O(1)$ bitů
 n bitů nestaci' budeme umíet n+1

Hagerup, Kammer, Sajenko



Read(i)

Init: $\mu \leftarrow 0$

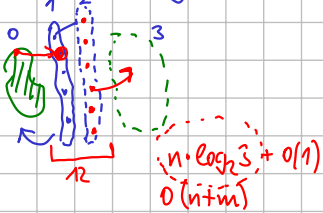
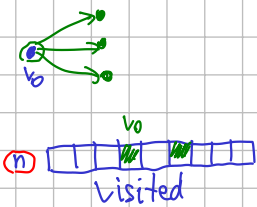
FindMinZero

$\mu = 0 \rightarrow \emptyset$
 $\mu > 0$ blk 1 $\left\{ \begin{array}{l} \text{spárovany } j \rightarrow j \\ \text{nepárovany } \rightarrow 1 \end{array} \right.$

WriteEasy(i, x)

(4) 3-colored C.D. \rightarrow BFS

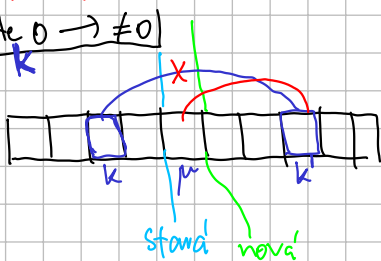
3 stavy: bílý ... neobjev.
 černý ... zprac.
 šedý ... rozhraní



C.D. "hranice" $n+1$

2n+1 bitů čas $O(n+m)$

Write 0 \rightarrow $\neq 0$



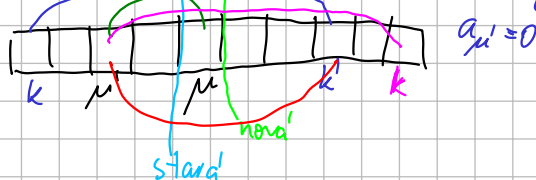
① μ nespárovany ... $a_\mu = 0$ (chceme spárovat)

Ⓐ $k < \mu$ spárovany s $k' > \mu$
 \Rightarrow spárujeme k' s μ
 uvolníme k

Ⓑ $k > \mu$ nespárovany
 \Rightarrow spárujeme k s μ

Ⓒ $k = \mu$ nespárovany
 \Rightarrow NOP

② μ spárovany s $\mu' < \mu$... $a_{\mu'} \neq 0$ chceme μ uvolnit



Ⓐ $k = \mu$ NEMASTANE

Ⓑ $k = \mu' < \mu$ chceme k uvolnit

Ⓒ $k < \mu, k < \mu'$ k spárovany s $k' > \mu$ $a_{k'} \neq 0$ md zůstát párový
 μ' spárujeme s k'
 μ, k uvolníme

Ⓓ $k > \mu$ k volné, chceme spárovat
 μ' spárujeme s k
 μ uvolníme

$\neq 0 \rightarrow 0$ analogicky

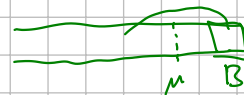
$w \geq \log n$

čas $O(1)$
 pamet $n + w$
 \downarrow
 $n + 1$



pro $\mu \leq B-1$

$\mu = B$



+1 bit

$$\sum_1^n n \cdot \log |\Sigma| + \epsilon + 1 + O(\log n)$$

