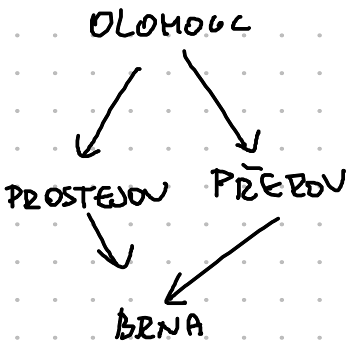
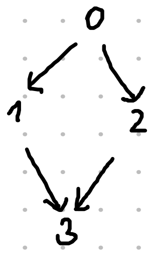




0 OLOMOUC
1 PROSTĚJOV
⋮

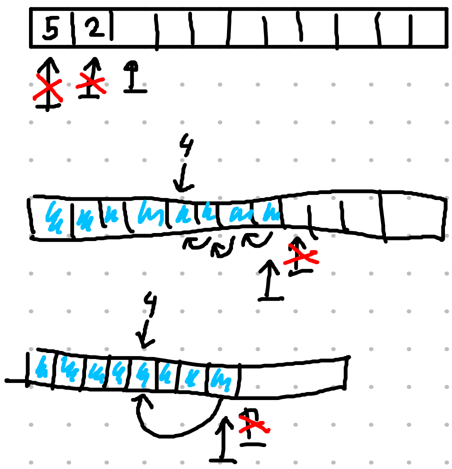
64 bitové číslo: X jako množina

$\{0, \dots 63\}$

$i \in X$ pk. i-tý bit x je 1

Array_Dict

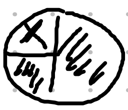
vlož 5,2



Smaž na indexu 4

Složitost search

$F_0 = \frac{1}{2}$
$F_1 = \frac{1}{4}$
$F_2 = \frac{1}{8}$
$\vdots$
$F_{n-1} = \frac{1}{2^{n-1}}$
$F_n = \frac{1}{2^{n-1}}$



$$C(n) = \frac{1}{2} + \frac{1}{4}\cdot 2 + \frac{1}{8}\cdot 3 + \dots \frac{1}{2^{n-1}}(n-1) + \frac{1}{2^{n-1}}\cdot n$$

$$- \frac{C(n-1)}{2} \qquad \frac{1}{4}\cdot 1 + \frac{1}{8}\cdot 2 + \dots \frac{1}{2^{n-1}}\cdot(n-2) + \frac{1}{2^{n-1}}(n-1)$$

$$\underbrace{\frac{1}{2} + \frac{1}{4} + \frac{1}{8} \quad + \frac{1}{2^{n-1}} + \frac{1}{2^{n-1}}}_{=1}$$

$$C(n) = \frac{C(n-1)}{2} + 1$$

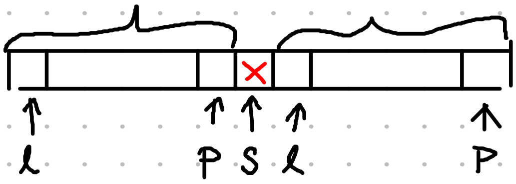
$$C(1) = 1$$

Tvrzení $C(n) \leq 2$ [pro $n \geq 2$]

$$c(n-1) \leq 2 \implies C(n) = \underbrace{\frac{c(n-1)}{2}}_{\leq 1} + 1 \leq 2.$$

$$C(n) = \Theta(1)$$

Binary search



$l + \frac{p-l}{2} \rightsquigarrow \left\lfloor \frac{l+p}{2} \right\rfloor$

$\cancel{l=0}$
$\cancel{p=0}$

$\rightsquigarrow \boxed{l > p} \to$ fail

$l = p$

$\frac{l+p}{2} = l = s$

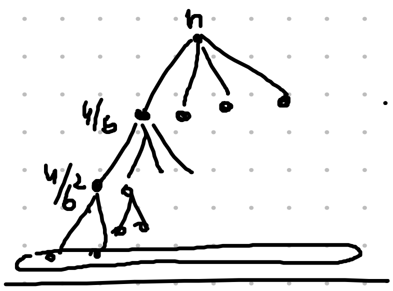
$\boxed{\text{Master thm}}$ $a \geq 1,\ b \geq 1$ $T(n) = a \cdot T(n/b) + f(n)$, $\varepsilon > 0$

$n^{\log_b a}$ .....

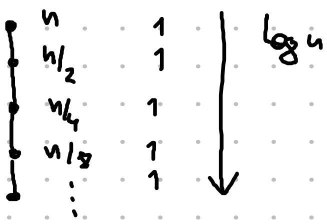
$f(n)$

$$f(n) = \begin{cases} O(n^{\log_b a - \varepsilon}) & T(n) = \Theta(n^{\log_b a}) \\ \Theta(n^{\log_b a}) & T(n) = \Theta(n^{\log_b a} \lg n) \\ \Omega(n^{\log_b a + \varepsilon}) & T(n) = \Theta(f(n)) \end{cases}$$

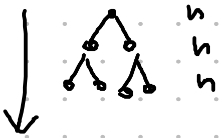
$n^{\log_2 1}$ .. $O(1)$ $\Theta(1 \cdot \lg n)$



$a^{\log_b b}$ ....



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



$n \cdot \log n$

$1 + 2 + 4 + \dots + 2^h = 2^{h+1} - 1$