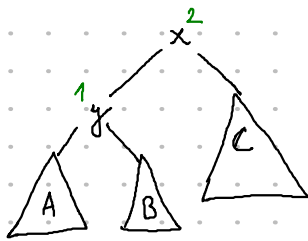


Vetale mezi $h(A)$, $h(B)$, $h(C)$.



$$h(A) = h(B) + 1$$

$$[y.bF = 1]$$

$$h(y) = h(C) + 2$$

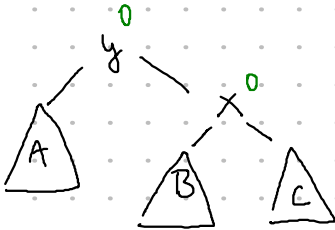
$$[x.bF = 2]$$

$$h(y) = 1 + h(A)$$

$$h(x) = h(A) + 2$$

$$h(x) = h(C) + 1$$

ROTATE-R(x)



A B C

$$x.bF = h(B) - h(C) = 0$$

$$h(y) = h(A) + 1$$

$$y.bF = h(A) - h(x)$$

$$= h(A) - (h(B) + 1)$$

$$= 0$$

všoh x svízila o 1

$$h(A) = h(B)$$

$$h(y) = h(A) + 1$$

$$h(y) = h(C) + 2$$

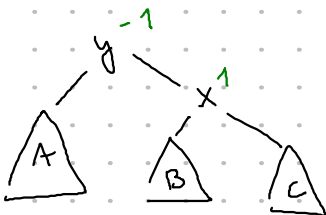
$$h(A) = h(C) + 1$$

$$h(x) = h(A) + 2$$

$$= h(B) + 2$$

A B C

ROTATE-R(x)



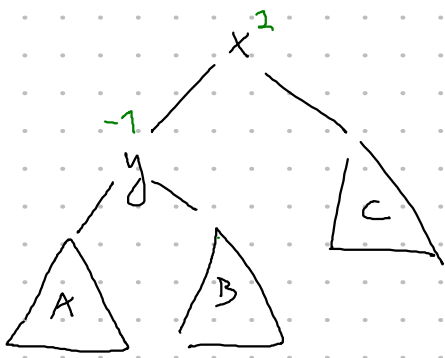
$$x.bF = 1$$

$$y.bF = h(A) - h(x)$$

$$= h(A) - (h(B) + 1) = -1$$

$$h(y) = h(B) + 2$$

všoh stromu se uzmenila



$$h(B) = h(A) + 1 \quad [y.bF = -1]$$

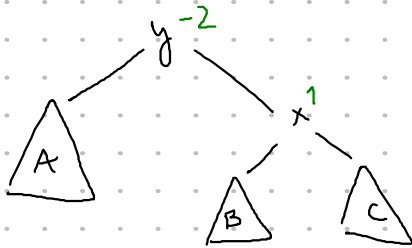
$$h(y) = h(B) + 1$$

$$h(y) = h(c) + 2$$

$$h(B) = h(c) + 1$$

A B c

ROTATE-R(x)

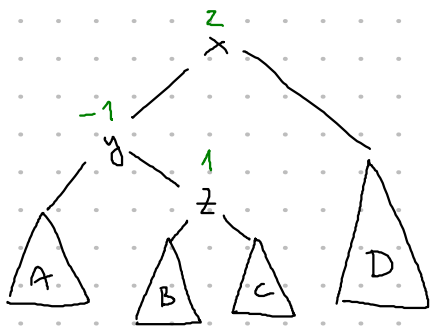


$$x.bF = 1$$

$$y.bF = h(A) - h(x)$$

$$= h(A) - (h(B) + 1)$$

$$= -2$$



$$h(B) = h(c) + 1 \quad [z.bF = 1]$$

$$h(A) = h(z) - 1$$

$$= (h(B) + 1) - 1$$

$$= h(B)$$

$$h(y) = h(D) + 2$$

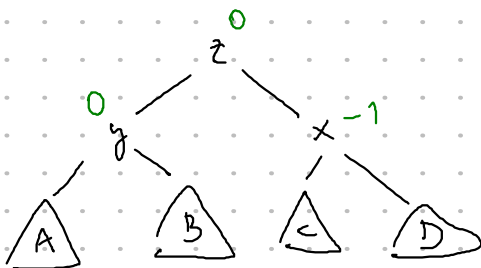
$$h(B) + 2 = h(D) + 2$$

$$h(B) = h(D)$$

$$h(x) = h(B) + 3$$

ROTATE-L(y)
ROTATE-R(x)

A B c D



$$x.bF = -1$$

$$y.bF = 0$$

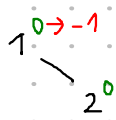
$$z.bF = 0$$

$$h(x) = h(B) + 2$$

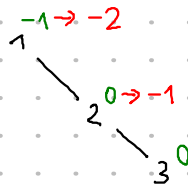
výška se zmenila o 1

1, 2, 3, 4, 5, 6, 7

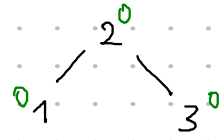
+1 1⁰ +2



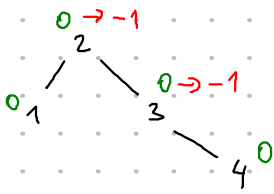
+3



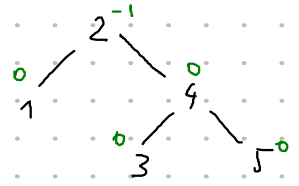
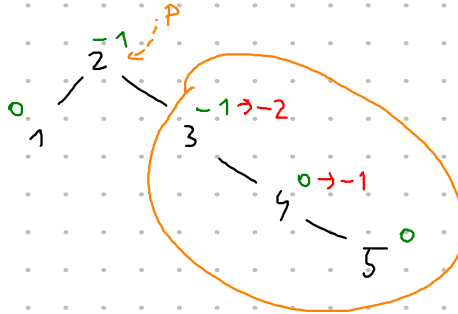
→



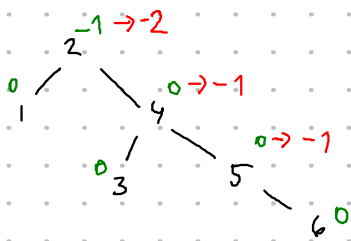
+4



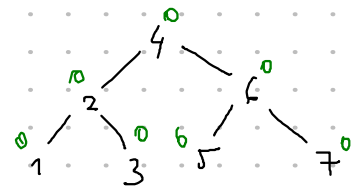
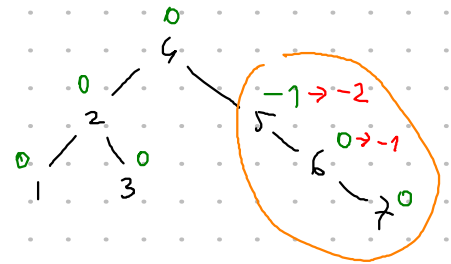
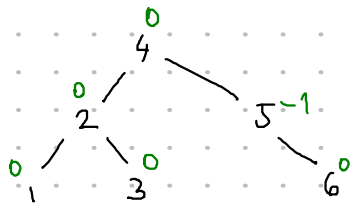
+5



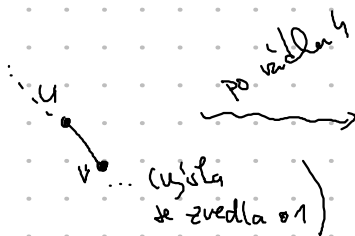
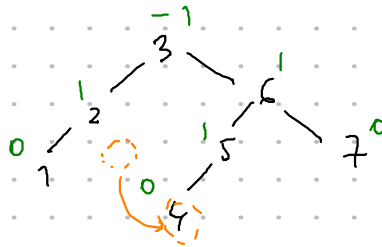
+6



+7



1, 7, 2, 6, 3, 5, 4



po vložení

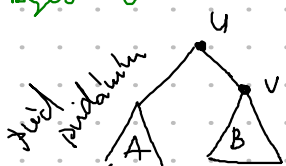
u.bf ∈ {-1, 1}



SLAVO 14

u.bf při změně (řádek u)

bylo 0

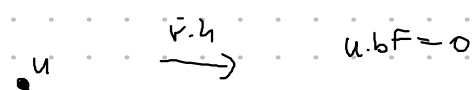


$h(A) = h(B)$

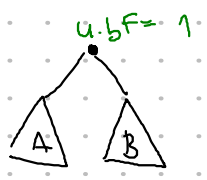
insert zraje $h(B) = 0$
(indukce!)

$h(u) = h(B) + 1$

SLAPD 15



u.bf $\begin{cases} -1 & (v \text{ je levý potomek}) \\ 1 & (v \text{ je pravý potomek}) \end{cases}$



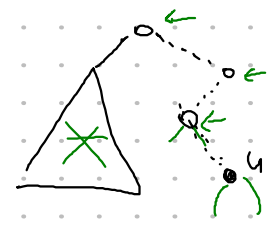
$h(B) = h(A) - 1$

$h(u) = h(A) + 1$

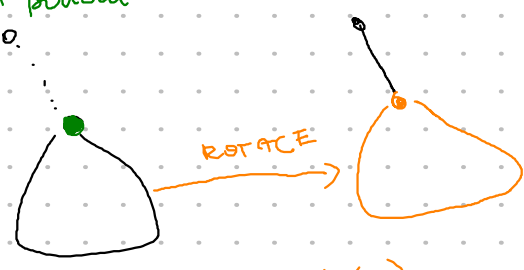
zvednu $h(B) + 1 \Rightarrow h(A) = h(B)$

$h(u) = h(A) + 1$

$h(u)$ je před a po přidání stýče!

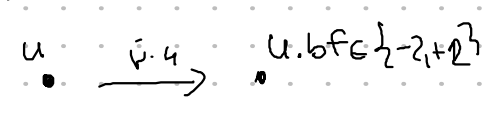


před přidání



$h(\bullet) = h(\bullet)$

PŘED $\xrightarrow{v.l}$ PO



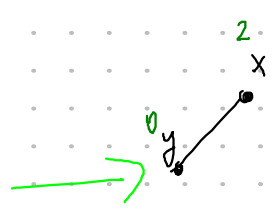
u.bf ∈ {1, -1}



$h(A) = h(B) + 1$

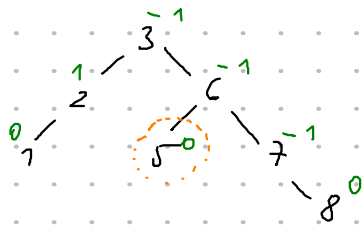
aby bylo u.bf = 2, musíme zvětšit $h(A) + 1$.

$h(u)$ zvedneme o 1

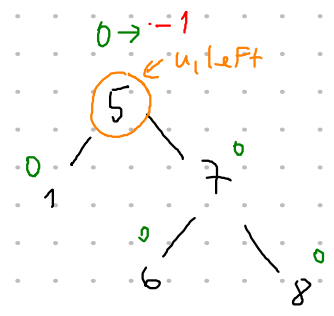
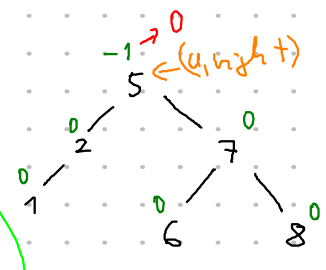
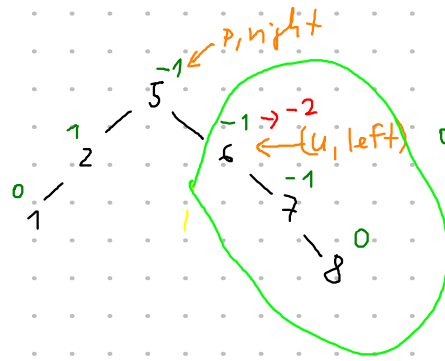


ALGORITMU KONČÍ TADY

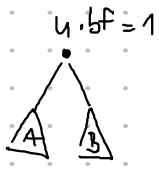
DELETE



-3



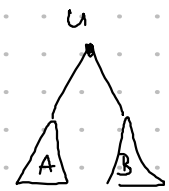
$u.bf \in \{-1, 1\}$ v.3 \rightarrow $u.bf = 0$



$h(A) = h(B) + 1$

zmenšime výšku A, \Rightarrow zmenšime $h(u)$
[0 1]

$u.bf = 0$ v.3 \rightarrow $u.bf \in \{-1, 1\}$



$h(A) = h(B)$

zmenšime $h(A) \pm 1$,
ale výška $h(u)$ sa nezmení