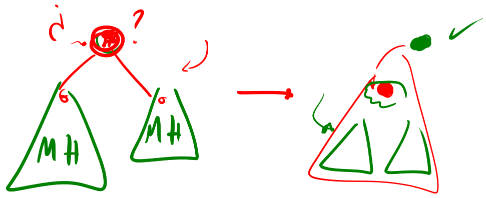


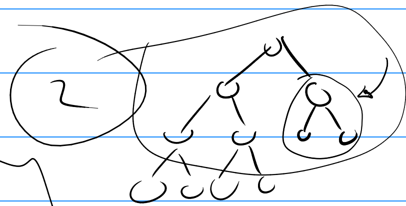
Max-HP(A, i):

"" Recibe un heap y su nodo raíz. Tq como máximo 1 nodo incumpla la prop de ~~MAH~~ MAX Heap (Nodo raíz). y
y Lo maxheapea

n_l: # nodos izquierda
n_r = " " der..

$$\boxed{n = 1 + n_l + n_r}$$

$$T(n) = 1\,T\left(\,\overset{n_l \,\text{ó}\, n_r}{¿?}\,\right) + C$$



(3, 7) (3)
(7, 4, 7)

$T(n) \leq$

n- Heap. h $\leftarrow \rightarrow$ $\boxed{2^h \leq n_h \leq 2^{h+1} - 1}$

- $h_l = h_r \longrightarrow$ $n_l = 2^{h+1} - 1$, $2^h \leq n_r \leq 2^{h+1} - 1 \leftarrow\rightarrow$ $\boxed{\frac{n_l + 1}{2} \leq n_r \leq n_l}$
- $h_l = h_r + 1$ $\quad n_r = 2^h - 1$ $\quad 2^h \leq n_l \leq 2^{h+1} - 1$

$n_r + 1 \leq n_l \leq 2n_r + 1$

$$\boxed{n_r \leq n_l \leq 2n_r + 1}$$

$\longleftrightarrow 3n_l \leq 2n_r + 2n_l + 1 = 2n - 1 \longrightarrow n_l \leq \frac{2n-1}{3} \leq \frac{2n}{3}$

$$T(n) \leq T(n_l) + C \leq 1\,T\left(\frac{2n}{3}\right) + C \sim \Theta(\lg n)$$

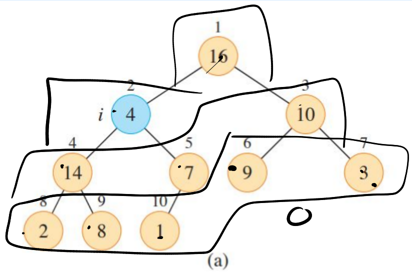
$T_{MH}(n) = O(\lg n) \longleftrightarrow$ $S_{MH}(h) = O(h) \le kh$

Tc n nodos

$\sum_{i=1}^{\lfloor n/2 \rfloor} T(n_i)$

$\sum_{h=1}^{\lfloor \lg n \rfloor} \sum \cdot \boxed{S_{MH}(h)}$

cada h



1 k3

2·(k2)

≤ 3·(k1)

← k0 ≤ 5k0

$\boxed{h:0}$ # nodos altura 0:

i tiene altura 0

⟷ i es valido y 2i, 2i+1 no lo son

$i \le n$ $\boxed{2i, 2i+1} > n$

$\boxed{2i > n}$

$2i \ge n+1$

$\lceil \frac{n+1}{2} \rceil \le i \le n$

#hojas $= n - \lceil \frac{n+1}{2} \rceil + 1 = \lceil \frac{n}{2} \rceil$

h:1 #

i alt 1

$2i \le n$ $4i \ge n+1$

$\lceil \frac{n+1}{4} \rceil \le i \le \lfloor \frac{n}{2} \rfloor$

→ $\#n_1 : \lfloor \frac{n}{2} \rfloor - \lceil \frac{n+1}{4} \rceil + 1 \le \frac{n}{4}$

$\lfloor \frac{n}{2^h} \rfloor - \lceil \frac{n+1}{2^{h+1}} \rceil + 1$

h=2

$\boxed{2^h i \le n}$ $2^{h+1} i \ge n+1$

h —— $i \cdot 2^h$

$i \cdot 2^h$

$\lceil \frac{n+1}{2^{h+1}} \rceil \le i \le \lfloor \frac{n}{2^h} \rfloor$