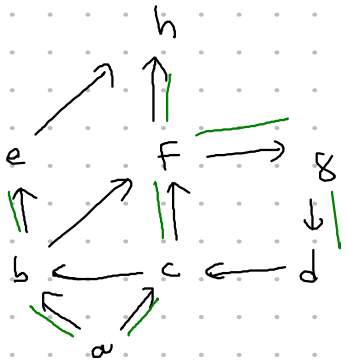


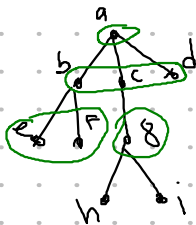
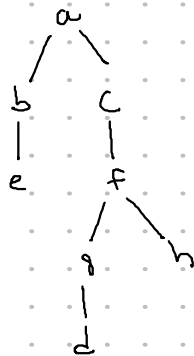
	0	1	2	3
0	0	1	1	0
1	0	0	0	0
2	0	0	0	0
3	1	1	0	0

	a	b	c	d	e	f	g	h
X	X	X	X	X	X	X	X	X



M: ~~a, b, c, d, e, f, g, h~~

poradi' uv'vstev: a, c, f, b, h, d, e



Fronta:  $\overline{a}, \overline{b, c, d}, \overline{e, f, g}, \overline{h, i}$

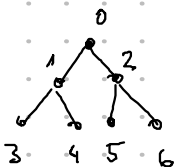
(min) Binary heap

→ bin. strom  
→ podmienka min-heap:



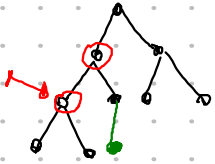
rodic' ma' vacsi' prioritu  
nez' potomok.

⇒ pro # potomkov (kolek' x),  
x ma' vacsi' prioritu  
z' celého podstromu.



i ma' potomky  $2i+1$   
 $2i+2$   
j ma' rodicu  $\lfloor j-1/2 \rfloor$

## Insert ("bubble insert")



porovnáme rodiče a potomka,  
pokud potvrdí min-heap podmínek  
(dítěd je poměněna)

složitost: vyhledání stromu:  $\Theta(\lg n)$

Decrease-key (analogicky), složitost  $\Theta(\lg n)$ ;

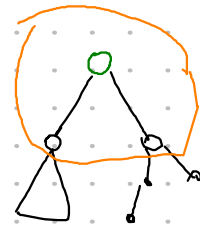
## Extract-min ("bubble")

→ minimum je u kořeni



odebereme kořen a  
nahradíme jej posledním  
vzchodem

Složitost  $\Theta(\lg(n))$ .



1) najdeme  
min prvok

