

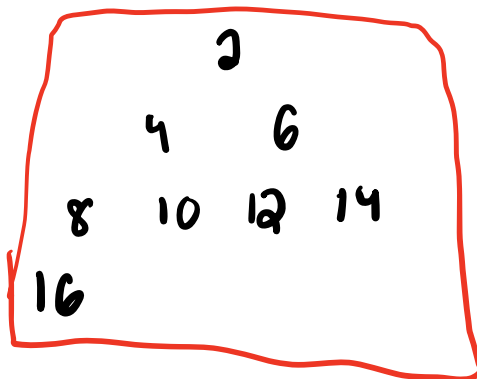
a)  $[10, 12, 3, 11, 6, 8, 9]$  min-Heap

10  $\rightarrow$  10  $\rightarrow$  10  $\rightarrow$  3  $\rightarrow$   
           12           12 3           12 10

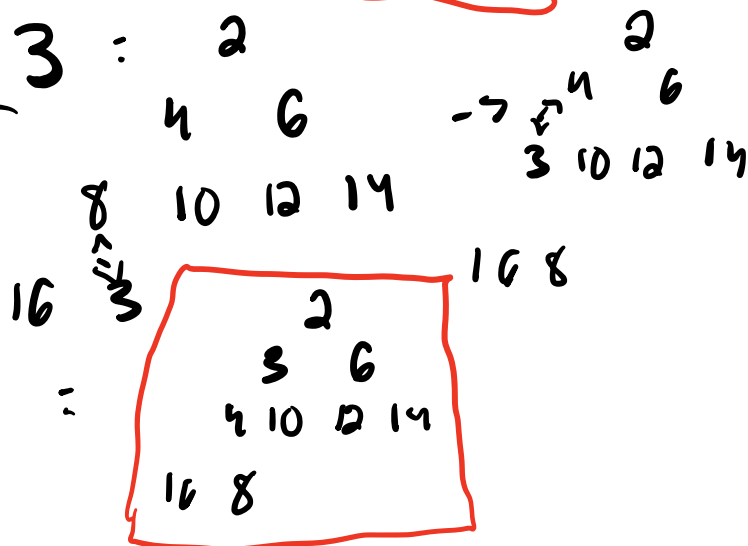
3           3           3           3  
 $\rightarrow$  12 10  $\rightarrow$  11 10  $\rightarrow$  11 10  $\rightarrow$  6 10  $\rightarrow$   
       12           12 6           12 11

3           3           3  
 6 10  $\rightarrow$  6 8  $\rightarrow$  6 8  $\leftarrow$   
 12 11 8   12 11 10   12 11 10 9

b) initial:



Insert 3:



pop =  $\begin{array}{c} 8 \\ 3 \quad 6 \\ 4 \quad 10 \quad 12 \quad 14 \\ 16 \end{array}$   $\rightarrow$   $\begin{array}{c} 3 \\ 8 \quad 6 \\ 4 \quad 10 \quad 12 \quad 14 \\ 16 \end{array}$   $\rightarrow$

$\begin{array}{c} 3 \\ 4 \quad 6 \\ 8 \quad 10 \quad 12 \quad 14 \\ 16 \end{array}$

pop pt 2. =  $\begin{array}{c} 16 \\ 4 \quad 6 \\ 8 \quad 10 \quad 12 \quad 14 \end{array}$   $\rightarrow$

$\begin{array}{c} 4 \\ 16 \quad 6 \\ 8 \quad 10 \quad 12 \quad 14 \end{array}$

$\begin{array}{c} 4 \\ 8 \quad 6 \\ 14 \quad 10 \quad 12 \quad 14 \end{array}$

Insert 5 =  $\begin{array}{c} 4 \\ 8 \quad 6 \\ 16 \quad 10 \quad 12 \quad 14 \\ 5 \end{array}$   $\rightarrow$   $\begin{array}{c} 4 \\ 8 \quad 6 \\ 5 \quad 10 \quad 12 \quad 14 \\ 16 \end{array}$   $\rightarrow$

$\begin{array}{c} 4 \\ 5 \quad 6 \\ 8 \quad 10 \quad 12 \quad 14 \\ 16 \end{array}$