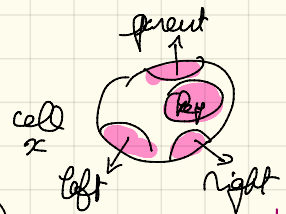


DELETE (a, t) // Delete node x in a binary search tree t

if  $x = t$  then  $t \leftarrow \text{nil}$  // Empty tree

else

if  $\text{left}[x] \neq \text{nil}, \text{right}[x] \neq \text{nil}$  then  $w \leftarrow \text{MINIMUM}(\text{right}[x])$   
 $\text{key}[x] \leftarrow \text{key}[w]$   
 $x \leftarrow w$



// MINIMUM returns the node with the smallest key in a subtree

define  $z$  and  $y$  {  
 if  $\text{left}[x] = \text{nil}$  then  $z \leftarrow \text{right}[x]$   
 else  $z \leftarrow \text{left}[x]$  //  $z$  can be nil  
 }  
 $y \leftarrow \text{parent}[x]$

update links {  
 if  $x = \text{right}[y]$  then  $\text{right}[y] \leftarrow z$   
 else  $\text{left}[y] \leftarrow z$   
 if  $z \neq \text{nil}$  then  $\text{parent}[z] \leftarrow y$   
 }

