

## RB-DELETE( $T, z$ )

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1   $y = z$ 
2   $y\text{-original-color} = y.\text{color}$ 
3  if  $z.\text{left} == T.\text{nil}$ 
4       $x = z.\text{right}$ 
5      RB-TRANSPLANT( $T, z, z.\text{right}$ )           // replace  $z$  by its right child
6  elseif  $z.\text{right} == T.\text{nil}$ 
7       $x = z.\text{left}$ 
8      RB-TRANSPLANT( $T, z, z.\text{left}$ )           // replace  $z$  by its left child
9  else  $y = \text{TREE-MINIMUM}(z.\text{right})$          //  $y$  is  $z$ 's successor
10      $y\text{-original-color} = y.\text{color}$ 
11      $x = y.\text{right}$ 
12     if  $y \neq z.\text{right}$                        // is  $y$  farther down the tree?
13         RB-TRANSPLANT( $T, y, y.\text{right}$ )       // replace  $y$  by its right child
14          $y.\text{right} = z.\text{right}$                  //  $z$ 's right child becomes
15          $y.\text{right}.p = y$                      //       $y$ 's right child
16     else  $x.p = y$                              // in case  $x$  is  $T.\text{nil}$ 
17     RB-TRANSPLANT( $T, z, y$ )                   // replace  $z$  by its successor  $y$ 
18      $y.\text{left} = z.\text{left}$                        // and give  $z$ 's left child to  $y$ ,
19      $y.\text{left}.p = y$                            //      which had no left child
20      $y.\text{color} = z.\text{color}$ 
21 if  $y\text{-original-color} == \text{BLACK}$              // if any red-black violations occurred,
22     RB-DELETE-FIXUP( $T, x$ )                   //      correct them
```