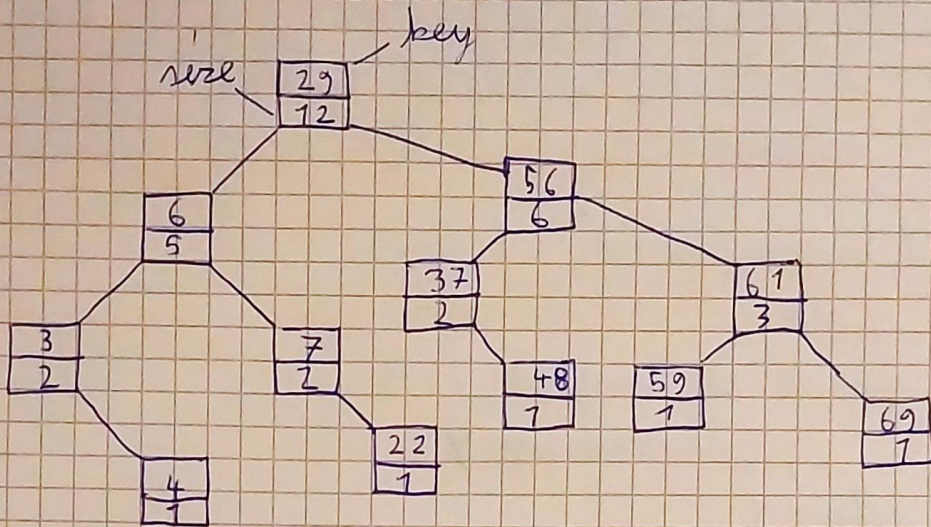


1.



2. OS\_SELECT( $x, i$ )  
 while ( $x \neq \text{NIL}$ )  
    $r = x.\text{left.size} + 1$   
   if ( $i == r$ )  
     return  $x$   
   else if ( $i < r$ )  
      $x = x.\text{left}$   
   else  
      $x = x.\text{right}$   
      $i = i - r$   
 return  $\text{NIL}$

~~3. OS\_KEY\_RANK( $T, k$ )~~  
~~while~~

3. OS\_KEY\_RANK( $T, k$ )  
 $x = T.\text{root}$   
 $r = 1$   
 while ( $x \neq \text{NIL}$ )  
   if ( $x.\text{key} == k$ )  
      $r += x.\text{left.size}$   
     break  
   else if ( $x.\text{key} > k$ )  
      $x = x.\text{left}$   
   else  
      $r += x.\text{left.size} + 1$   
      $x = x.\text{right}$   
 if ( $x == \text{NIL}$ )  
   return  $\text{NIL}$   
 return  $r$



4. a)  $\text{ithSuccessor}(x, i)$

VSA;  $O(\lg n)$

$r = \text{OS\_KEY\_RANK}(x, x, \text{key})$   
 $\text{return } (\text{OS\_SELECT}(x, i+r))$

b)  $\text{ithSuccessor}(x, i)$

$y = x$   
 $\text{for } k \text{ in range}(1, i+1)$   
 $y = \text{successor}(y)$   
 $\text{return } y$

VSA od  $\text{successor}$  je  $O(k+h)$

$k$  - broj razmatranih grana

$h$  - visina stabla

Pa je VSA od  $\text{ithSuccessor}$   $O(k + \lg n)$