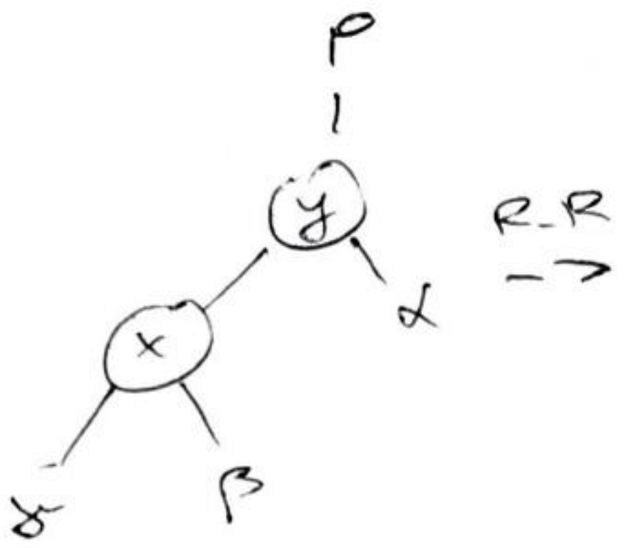
MATEJ SRAJIĆ

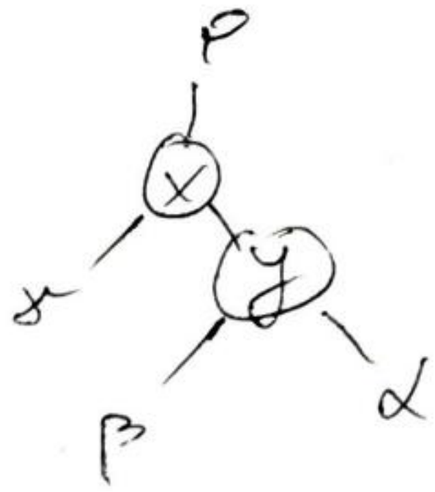
SPA 2

ZADAĆA 5

(1.)

```
RIGHT_ROTATE(T, x)
y = x.left
x.left = y.right
if y.right ≠ NIL
| y.right.p = x
if x.p == NIL
| T.root = y
else if x == x.p.right
| x.p.right = y
else x.p.left = y
y.right = x
y.p = x.p
x.p = y
```





Primjerice:

(2.)

```
INSERT(T, x, key)
if x == NIL
| x.key = key
| x.h = 1
else if key < x.key
| x.left = INSERT(T, x.left, key)
| x.left.p = x
else if key > x.key
| x.right = INSERT(T, x.right, key)
| x.right.p = x
else return x
x.h = 1 + max(x.left.h, x.right.h)
balance = BALANCE OF NODE(x)
if balance > 1 && key < x.left.key
| return RIGHT_ROTATE(T, x)
if balance < -1 && key > x.right.key
| return LEFT_ROTATE(T, x)
if balance > 1 && key > x.left.key
| x.left = LEFT_ROTATE(T, x.left)
| return RIGHT_ROTATE(T, x)
if balance < -1 && key < x.right.key
| x.right = RIGHT_ROTATE(T, x.right)
| return LEFT_ROTATE(T, x)
return x
```

ANALIZA:

UBACIVANJE U BST KOD BALANSIRANOG STABLA (AVL) JE $O(\lg n)$ JER JE VISINA STABLA UVIJEK $O(\lg n)$.

SVI IF-STATEMENTI SU OČITO $O(1)$

PREOSTAJE SAMO LEFT/RIGHT ROTATE ŠTO SMO POKAZALI DA JE U KONSTANTNOM VREMENU $O(1)$

=> UKUPNA VREMENSKA SLOŽENOST IZNOSI $O(\lg n)$.