

RB-INSERT-FIXUP(T, z)

while $z.p.color == \text{RED}$

if $z.p == z.p.p.left$

$y = z.p.p.right$

if $y.color == \text{RED}$

$z.p.color = \text{BLACK}$

$y.color = \text{BLACK}$

$z.p.p.color = \text{RED}$

$z = z.p.p$

else if $z == z.p.right$

$z = z.p$

 LEFT-ROTATE(T, z)

$z.p.color = \text{BLACK}$

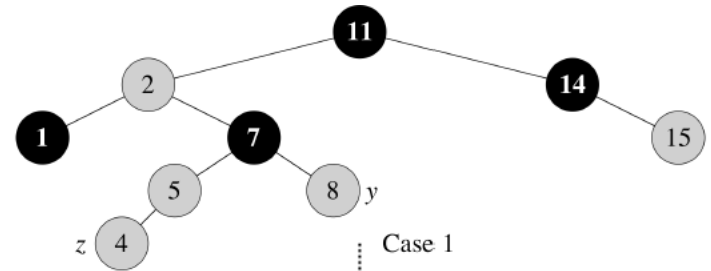
$z.p.p.color = \text{RED}$

 RIGHT-ROTATE($T, z.p.p$)

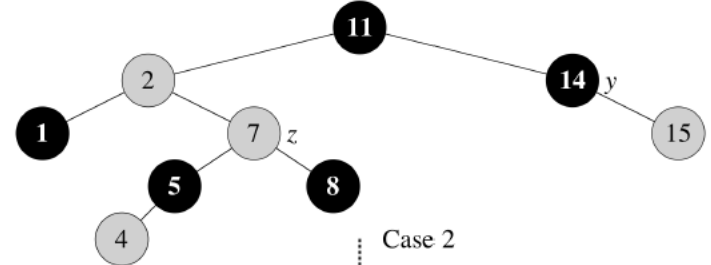
else (same as **then** clause with “right” and “left” exchanged)

$T.root.color = \text{BLACK}$

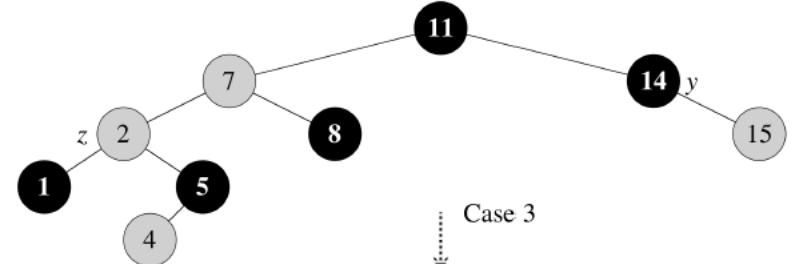
(a)



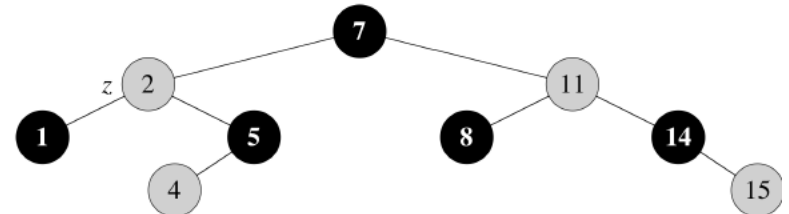
(b)

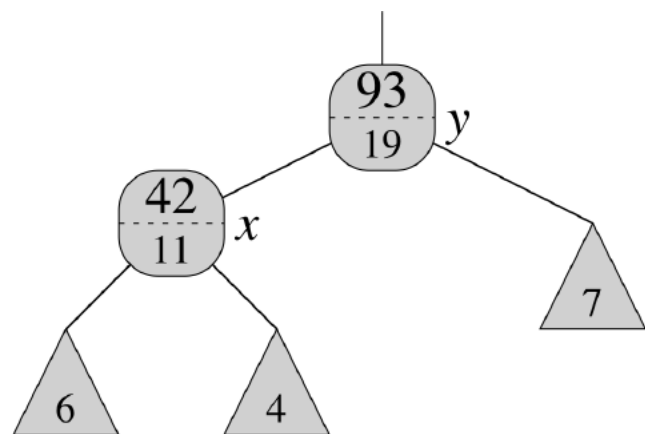
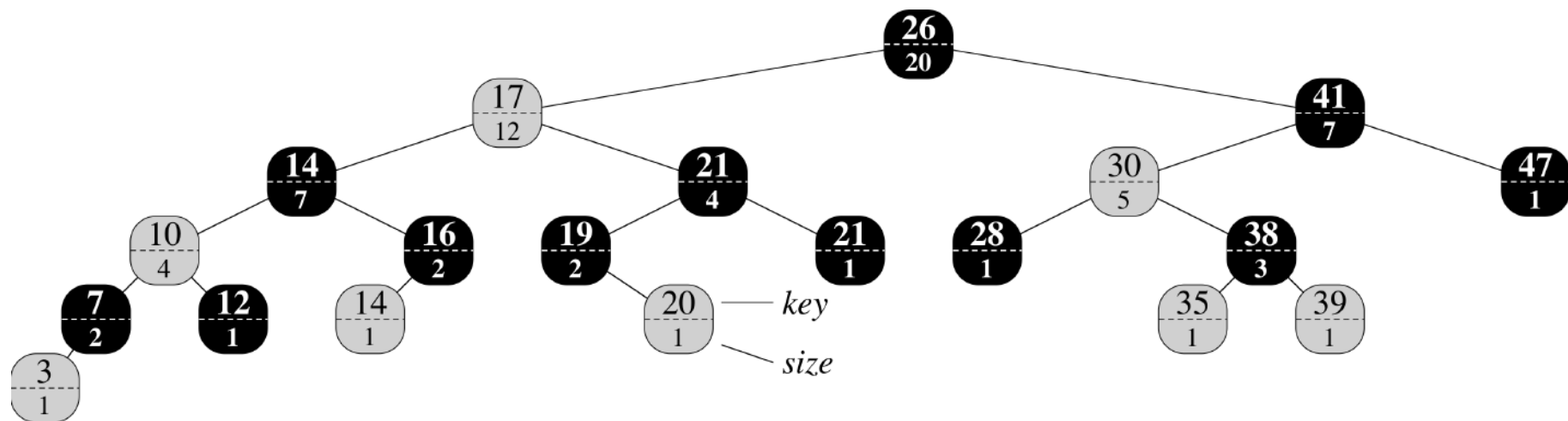


(c)



(d)

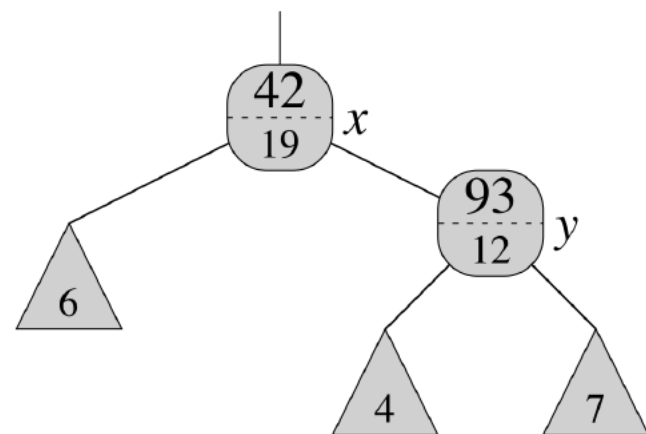




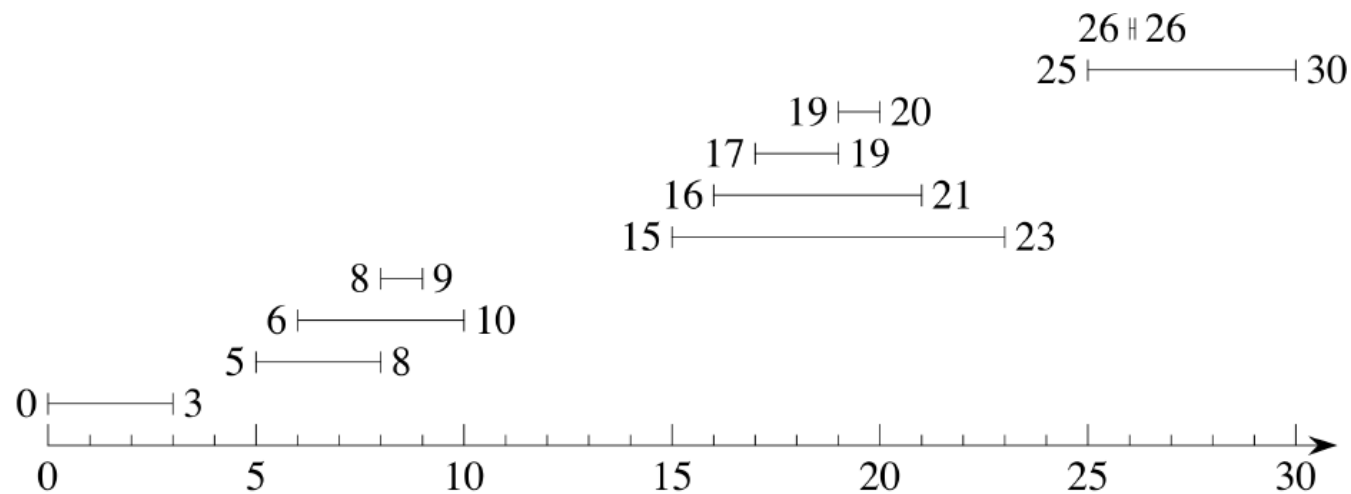
LEFT-ROTATE(T, x)



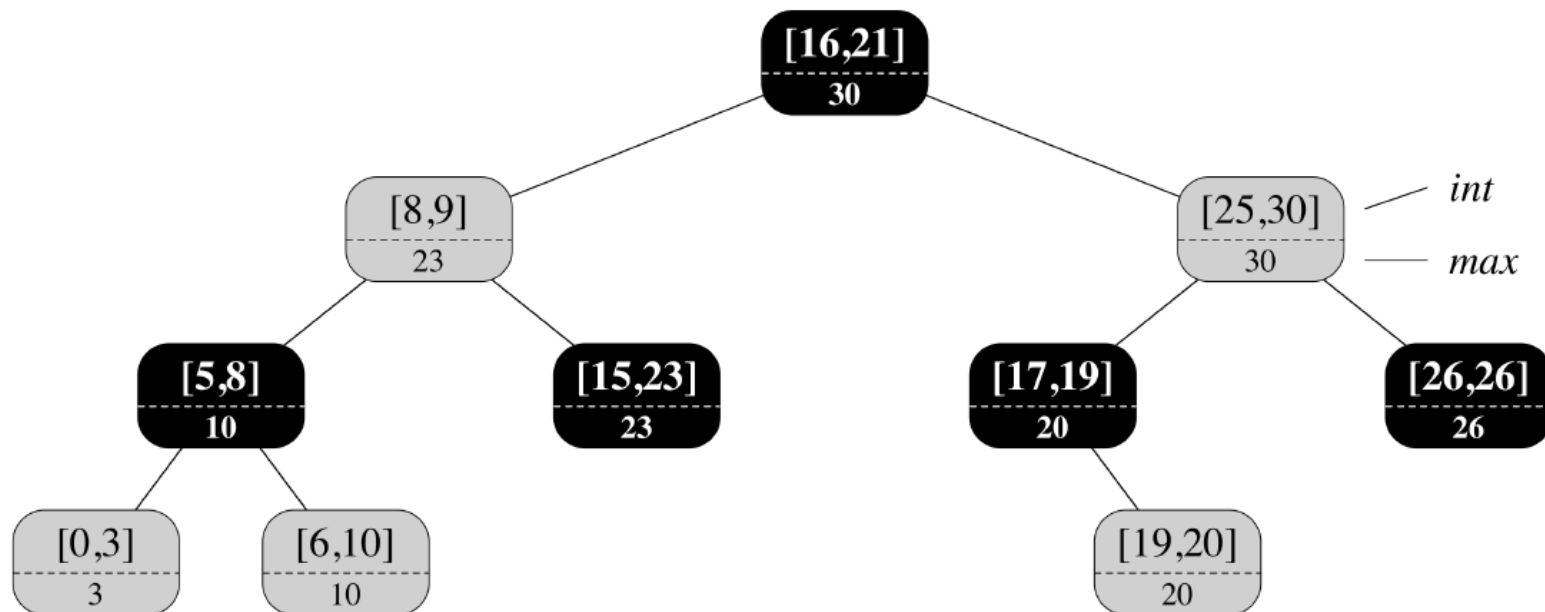
RIGHT-ROTATE(T, y)



(a)



(b)



INTERVAL-SEARCH(T, i)

$x = T.root$

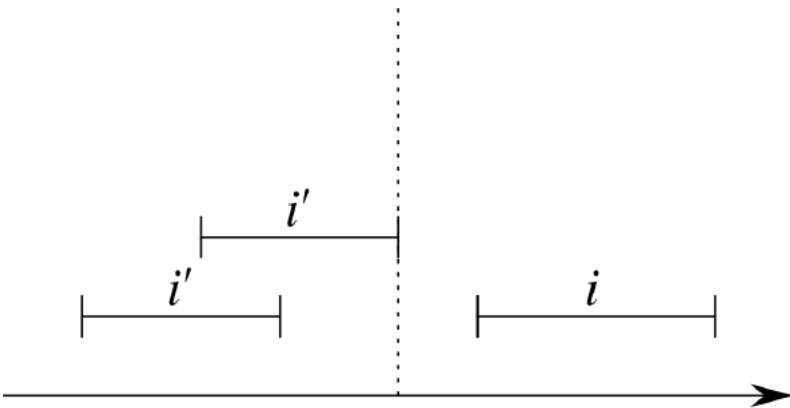
while $x \neq T.nil$ and i does not overlap $x.int$

if $x.left \neq T.nil$ and $x.left.max \geq i.low$

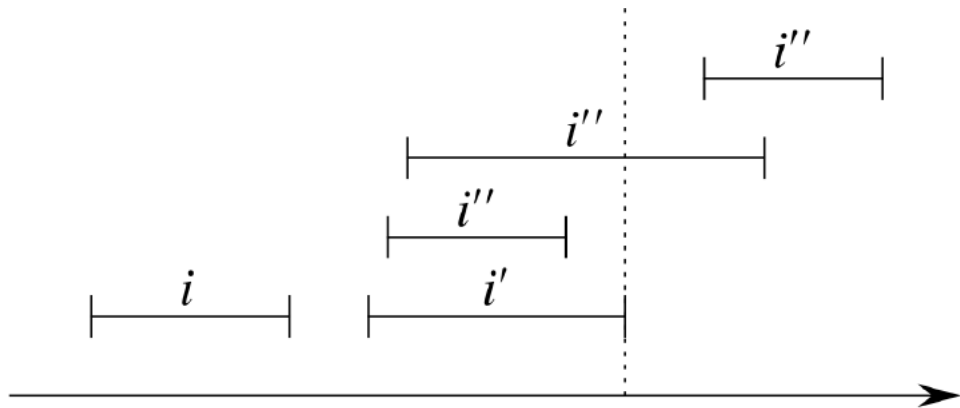
$x = x.left$

else $x = x.right$

return x



(a)



(b)