

Lab 7 - Red Black Tree Insertion

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insert (key)

~~new~~ node \rightarrow data = key
node \rightarrow color = 1

node \rightarrow x = root, y = null
while (x)

y = x

if node \rightarrow data < x \rightarrow data
x = x \rightarrow left

else

x = x \rightarrow right

node \rightarrow parent = y
if (!y)

root = node

else if node \rightarrow data < y \rightarrow data
y \rightarrow left = node

else

y \rightarrow right = node

if !node \rightarrow parent

node \rightarrow color = 0

exit

if !node \rightarrow parent \rightarrow parent

exit

fix (node)

Fix (Node k)

node u

while (k → parent → color)

if k → parent = k → parent → parent → right

u = k → parent → parent → left

if u → color

u → color = 0

k → parent → color = 0

k → parent → parent → color = 1

k = k → parent → parent

else

if k = k → parent → left

k = k → parent

rightRotate(k)

k → parent → color = 0

k → parent → parent → color = 1

leftRotate(k → parent → parent)

else

u = k → parent → parent → right

if u → color

u → color = 0

k → parent → color = 0

k → parent → parent → color = 1

k = k → parent → parent

else

if k = k → parent → right

k = k → parent

leftRotate(k)

~~k~~ k → parent → color = 0

k → parent → parent → color = 1

rightRotate(k → parent → parent)

root → color = 0