

Red-Black Tree INSERTION 4 dummies

Grandparent G
Parent P
inserted node x

S1
No
Insert node x similarly to Binary Tree & assign red colour to it.
is x the root node?

Yes

change x 's color to BLACK.
 x has been inserted :-)

S2

Is x 's parent RED

No

Insertion complete

YES

Is x 's uncle RED?

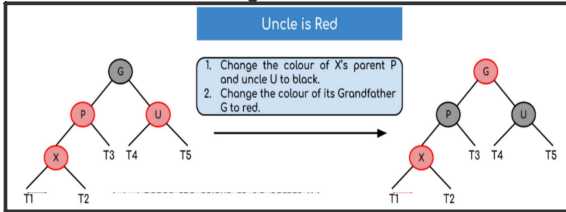
NO

So, x 's uncle is BLACK, which case looks like yours?

Yes

Uncle is Red

1. Change the colour of x 's parent P and uncle U to black.
2. Change the colour of its Grandfather G to red.



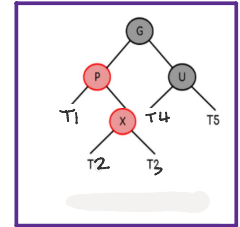
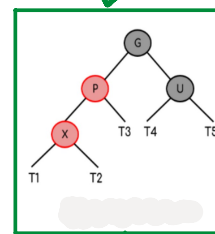
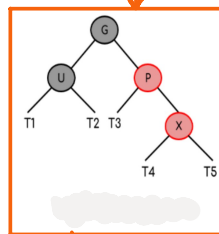
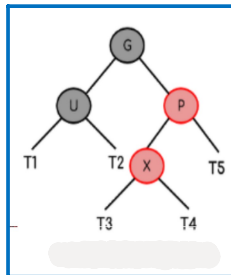
Return to S2, and repeat steps for G considering it as X, until you reach the root node

RL

RR

LL

LR



Left Rotation of P

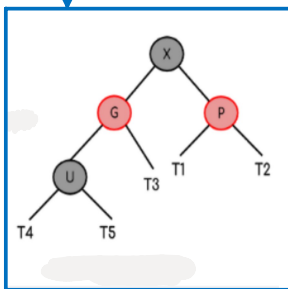
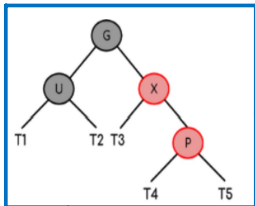
Right Rotation of P

Left Rotation of G
+
Swap colors of G & P

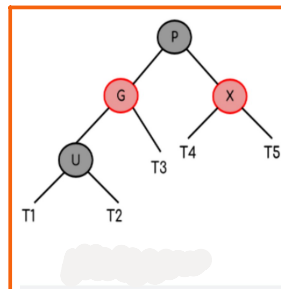
Right Rotation of G
+
Swap colors of G & P

Right Rotation of G
+
Swap colors of G & X

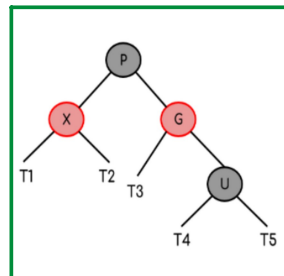
Left rotation G
+
Swap colors of G & X



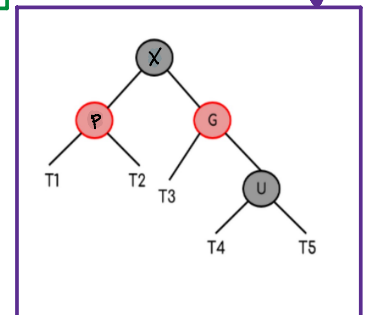
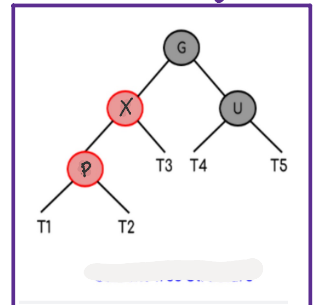
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