

Tutorial 8: Red Black Tree Example

① Build a red black tree for the data {49, 92, 89, 83, 30, 2, 63, 45, 55, 32}

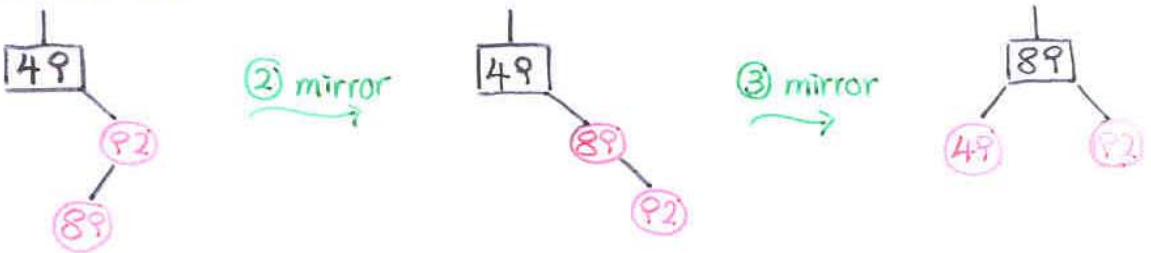
Ans: insert 49:



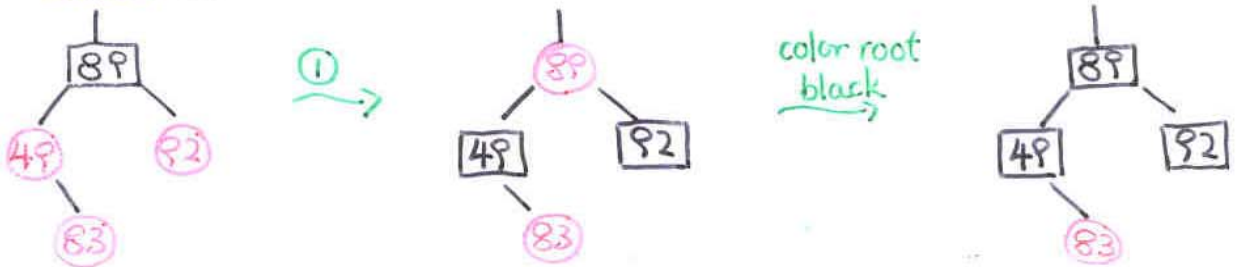
insert 92:



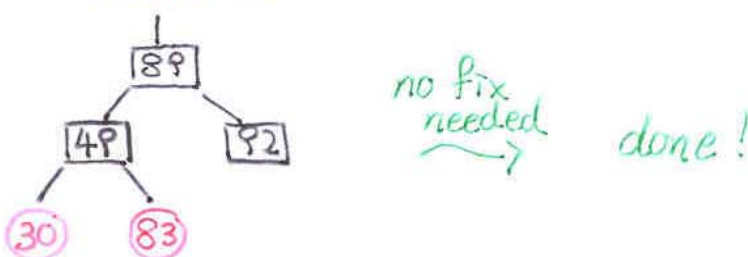
insert 89:



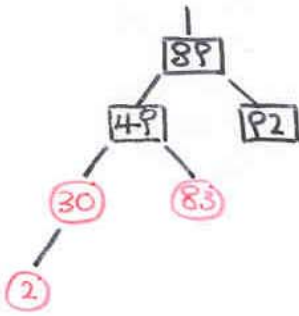
insert 83:



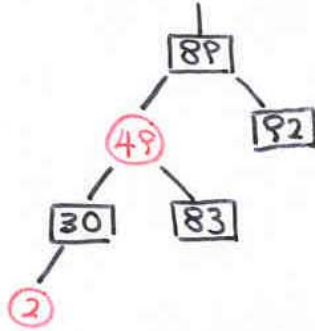
insert 30:



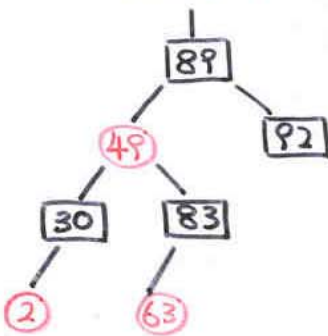
insert 2:



① →

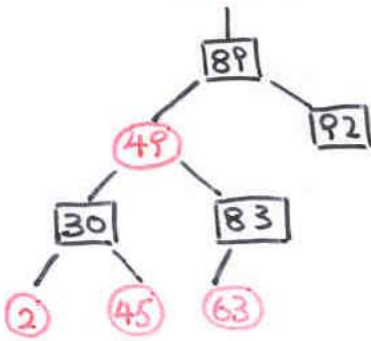


insert 63:



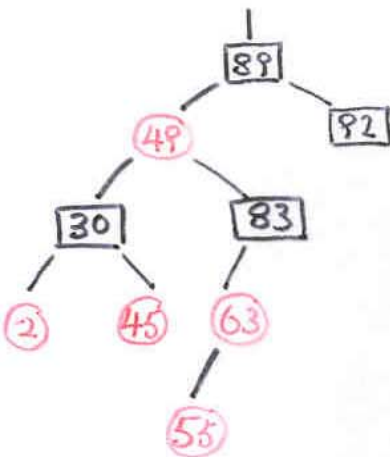
no fix needed
→ done!

insert 45:

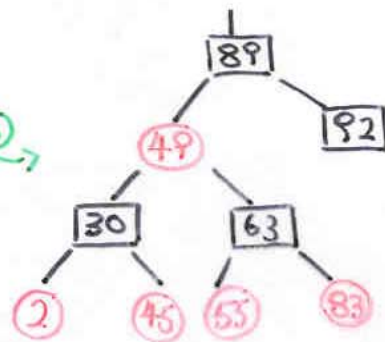


no fix needed
→ done!

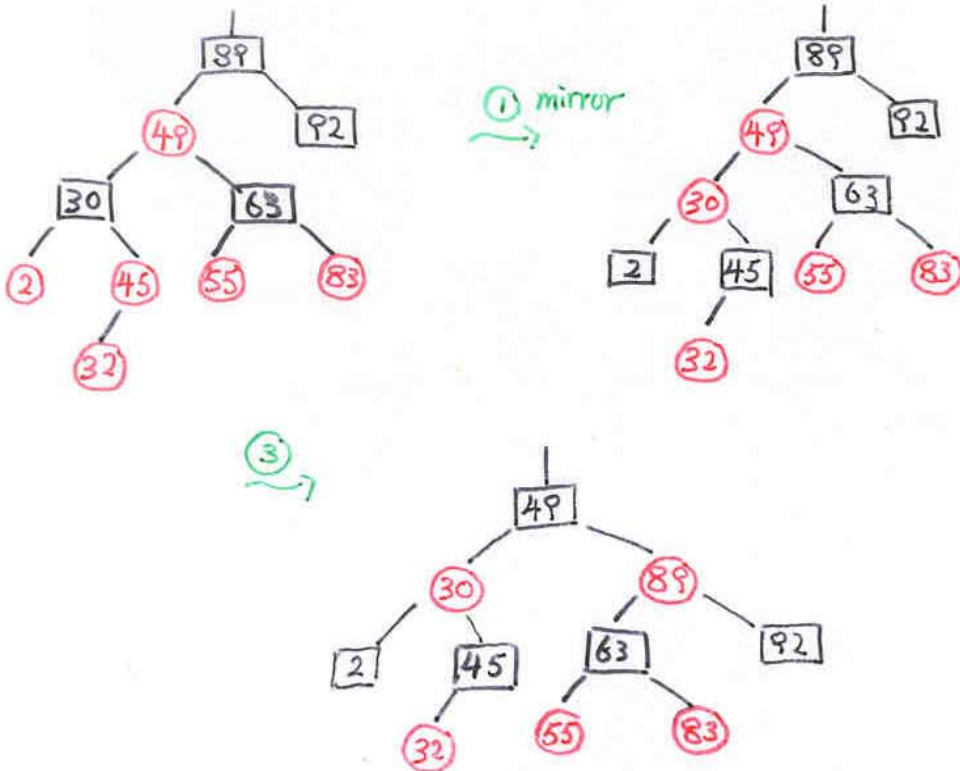
insert 55:



② →

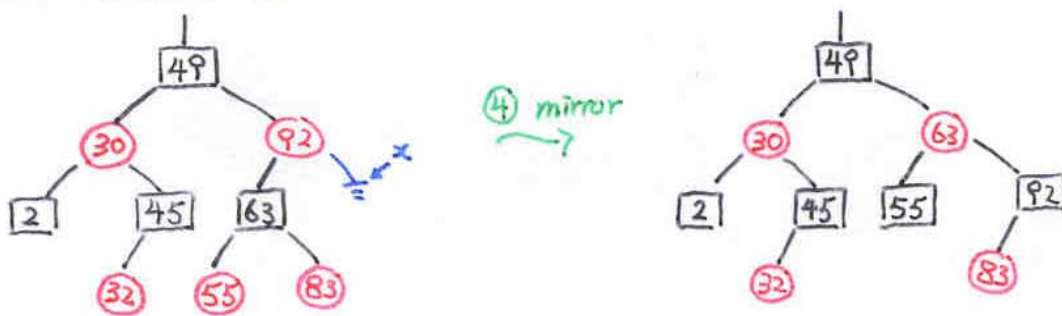


insert 32:

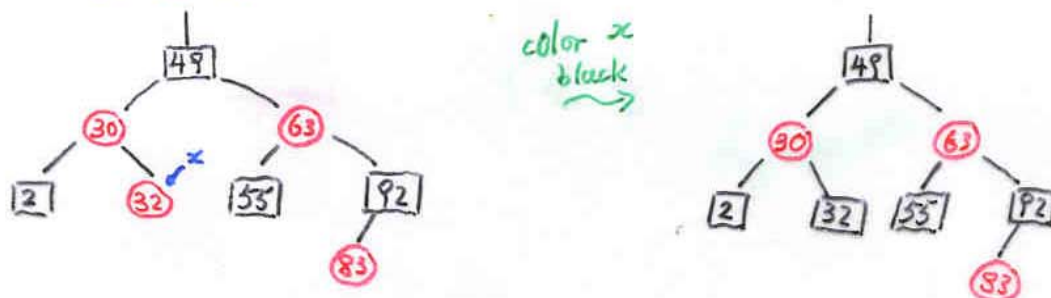


② Remove the nodes $\{89, 45, 30, 32, 2\}$ from the RB-tree obtained from ①.

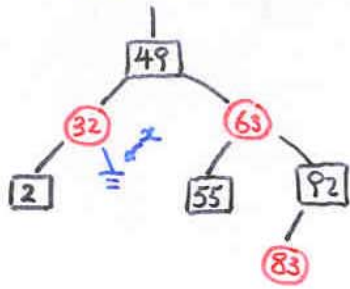
Ans: remove 89:



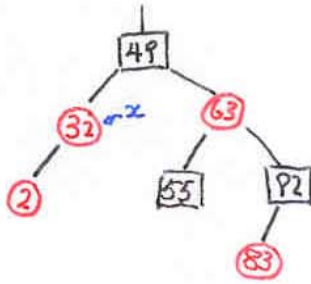
remove 45:



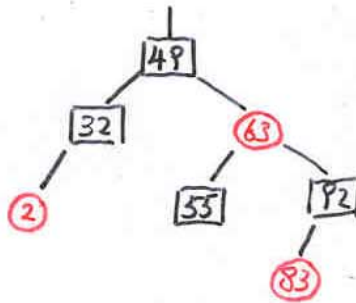
remove 30:



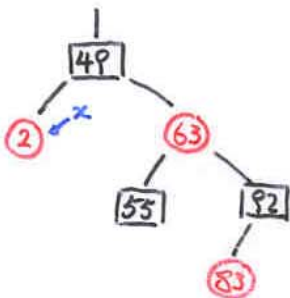
② mirror



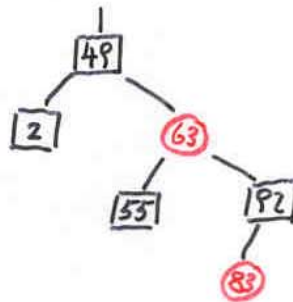
color x black



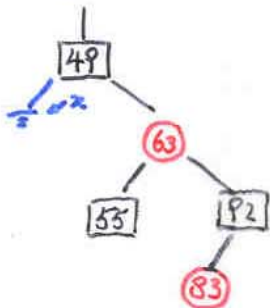
remove 32:



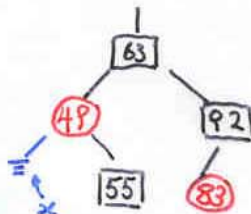
color x black



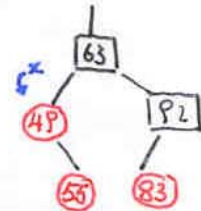
remove 2:



①



②



color x black

