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}
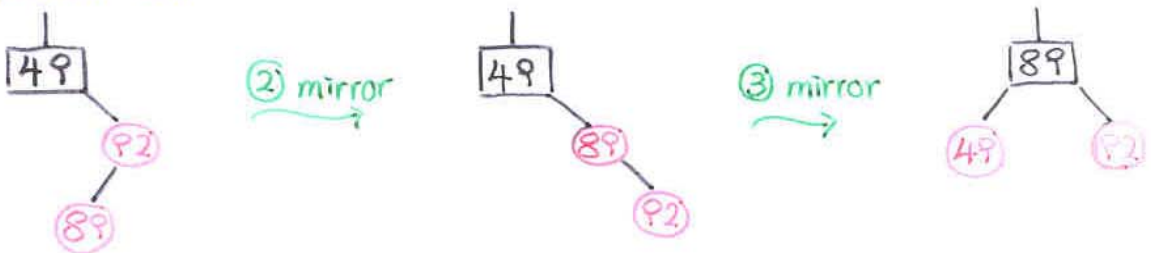
Ans: insert 49:
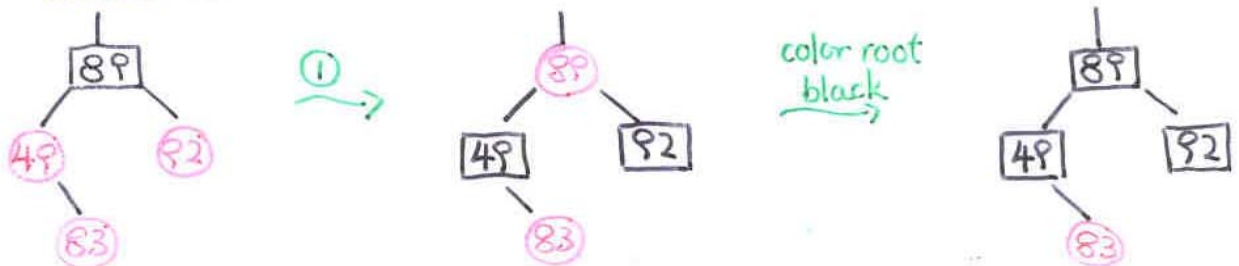
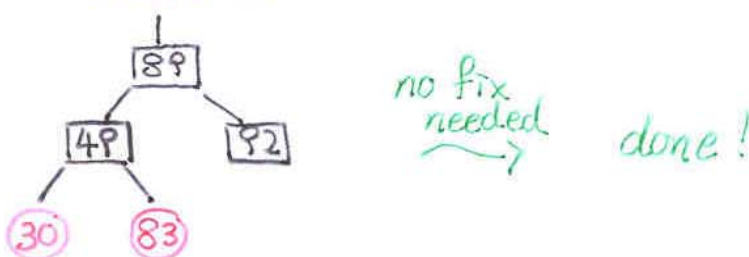(49)   color root black → |49|

insert 92:

|49| no fix needed →   done!
  (92)

insert 89:

|49| ② mirror → |49| ③ mirror → |89|
  (92)   (89)   (49) (92)
  (89)   (92)

insert 83:

  |89| ①   (89)   color root black → |89|
 (49) (83)   → |49| |92| |49| |92|
   (83)   (83)   (83)
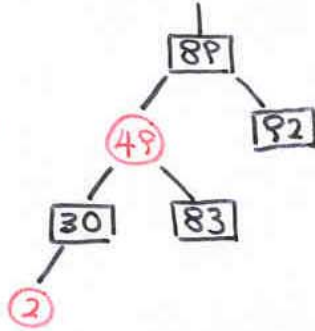
insert 30:

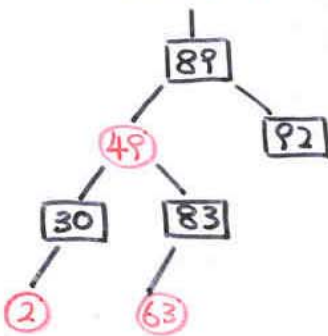 |89| no fix needed →   done!
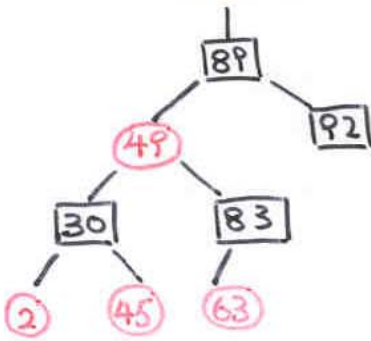 |49| |92|
(30) (83)
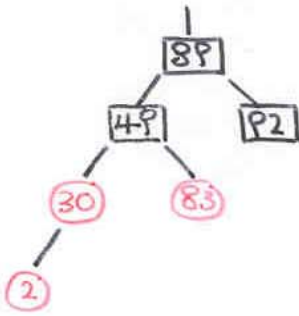
insert 2:

① →

insert 63:
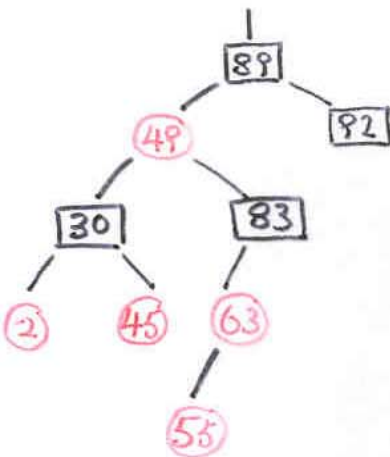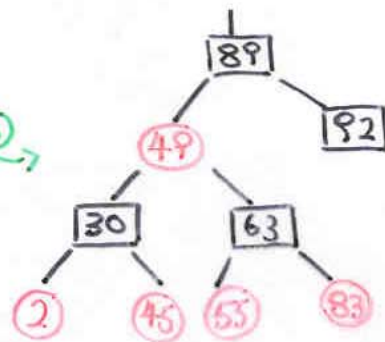
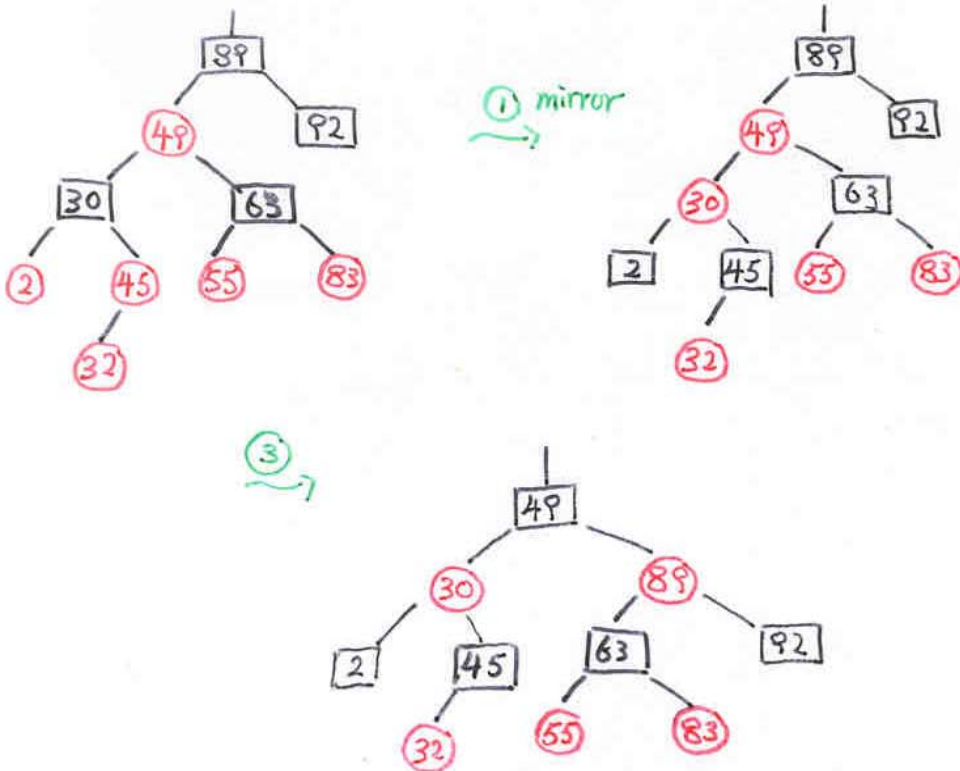

no fix
  needed
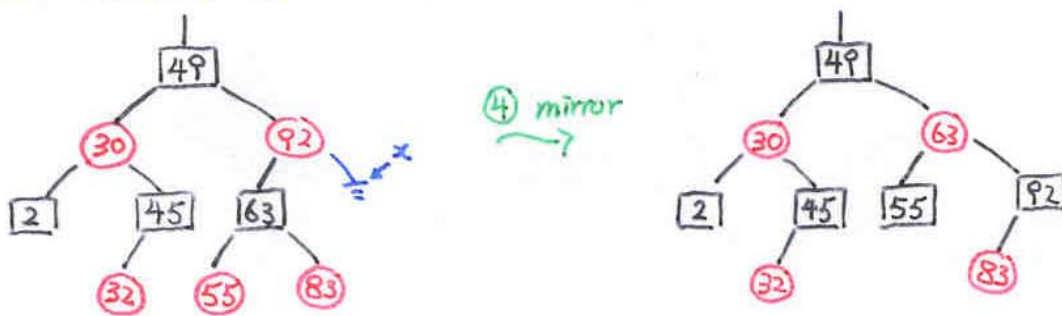→   done!

insert 45:

no fix
  needed
→   done!

insert 55:

② →

insert 32:

① mirror

③

② Remove the nodes {89, 45, 30, 32, 2} from the RB-tree obtained from ①.
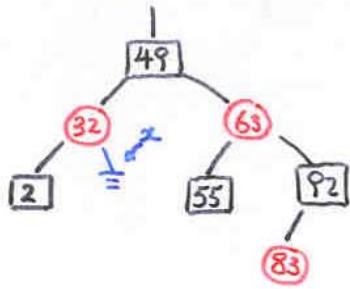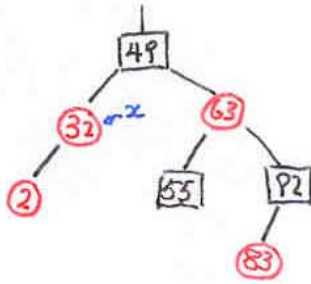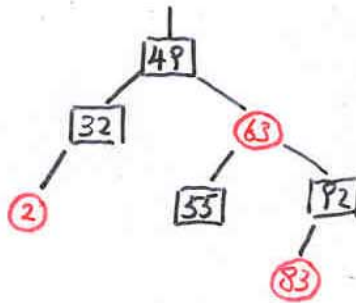
Ans: remove 89:

④ mirror

remove 45:

color x black

remove 30:

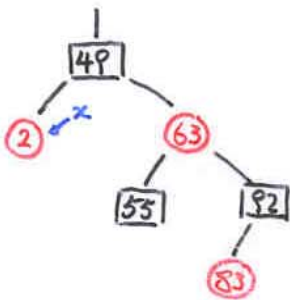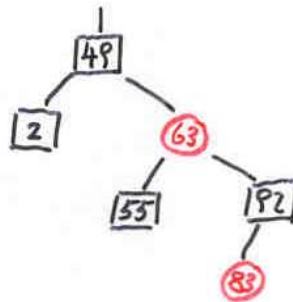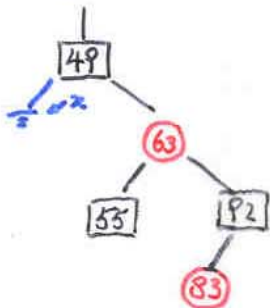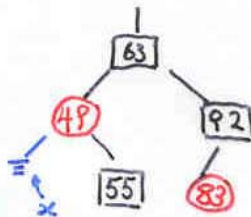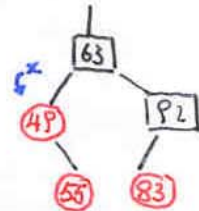

② mirror →

color x
black →

remove 32:

color x
black →

remove 2:

① →

② →

color x
black →