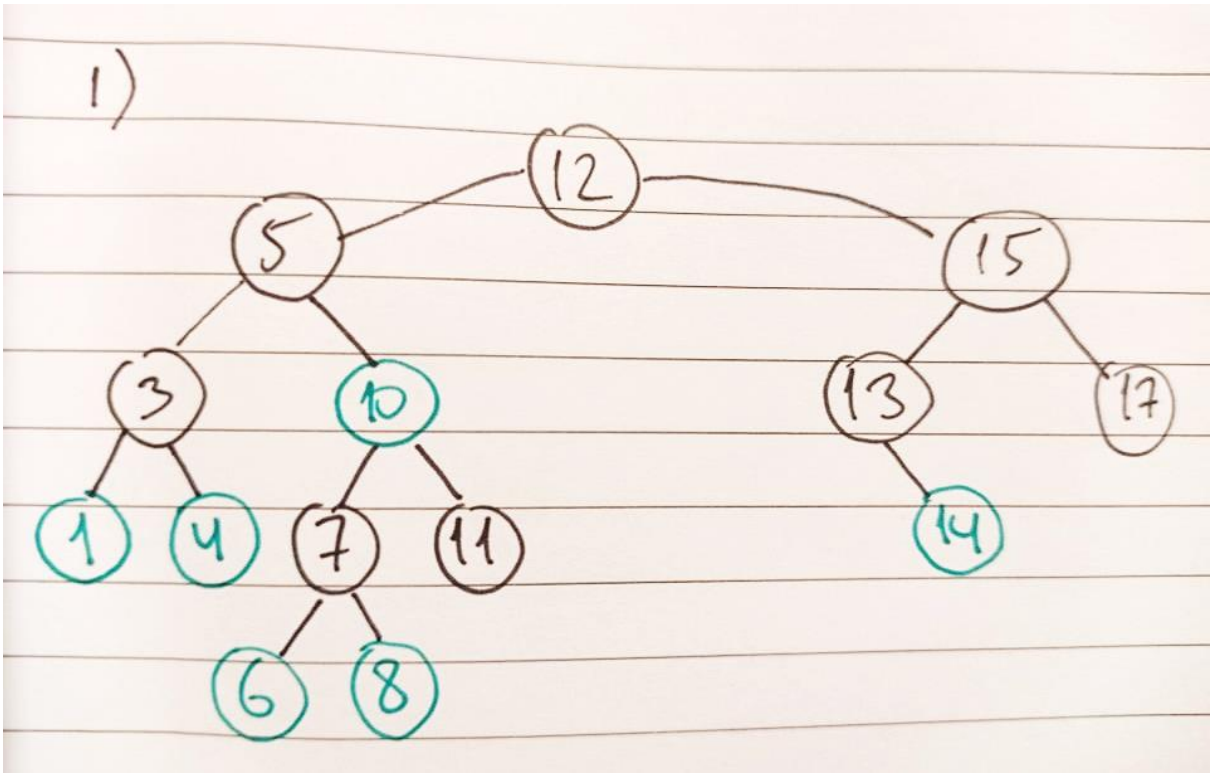
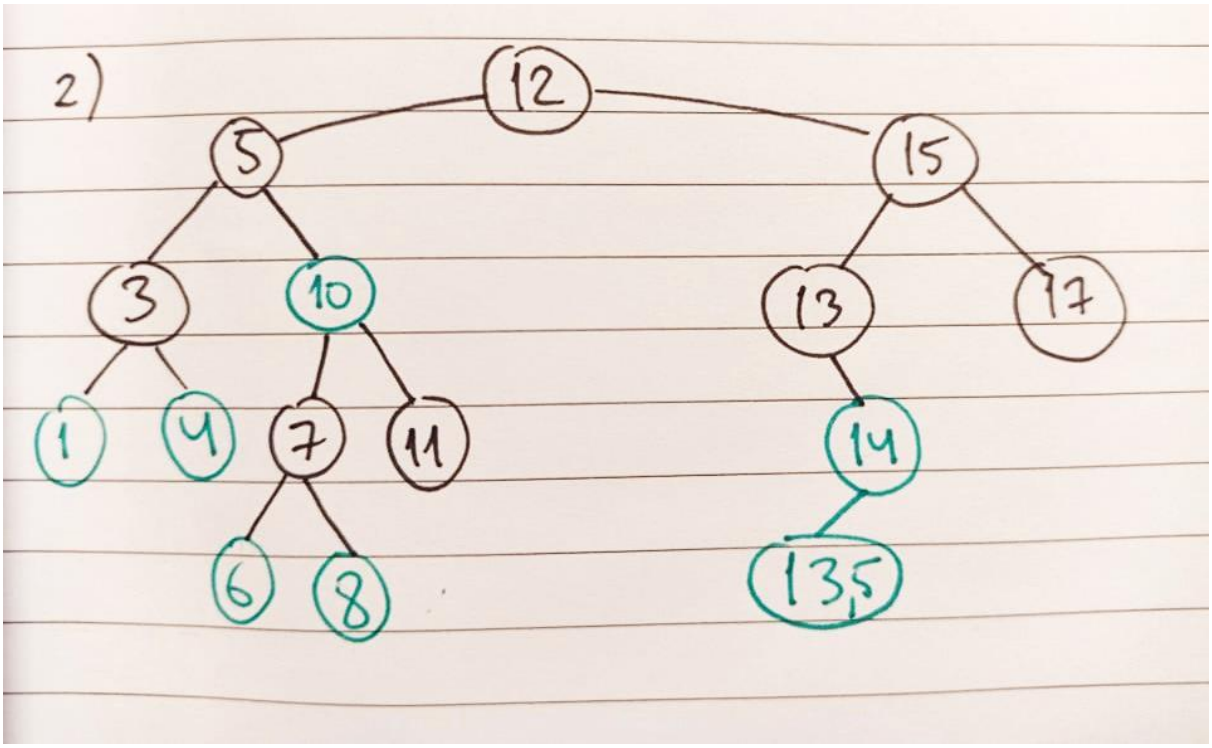
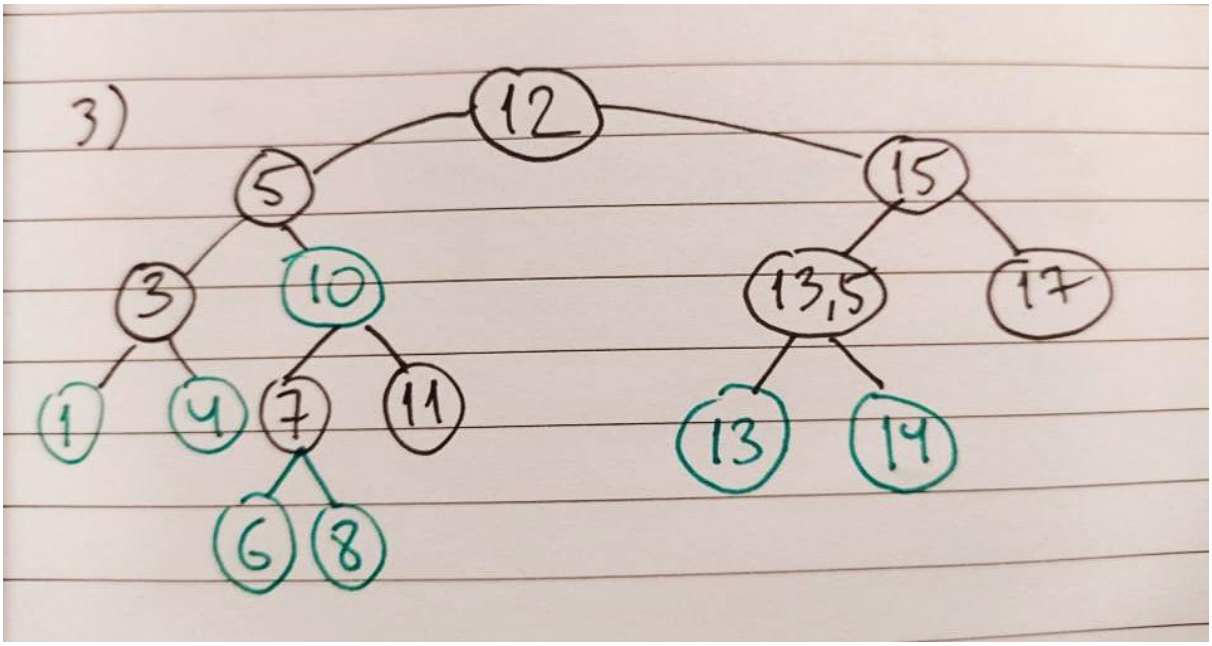
1. Add element [1]. It does not violate the RBT rule.



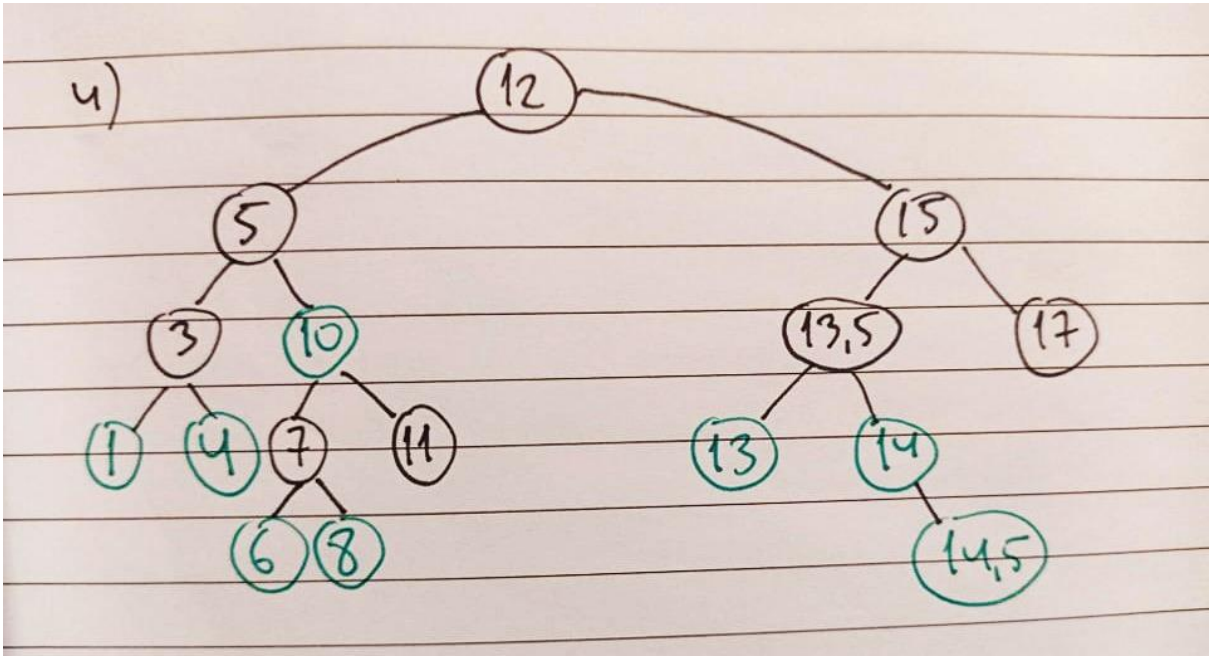
2. Add element 13.5 and 2 consecutive red elements exist now (14, 13.5). We shall do double rotation on 13,14,13.5



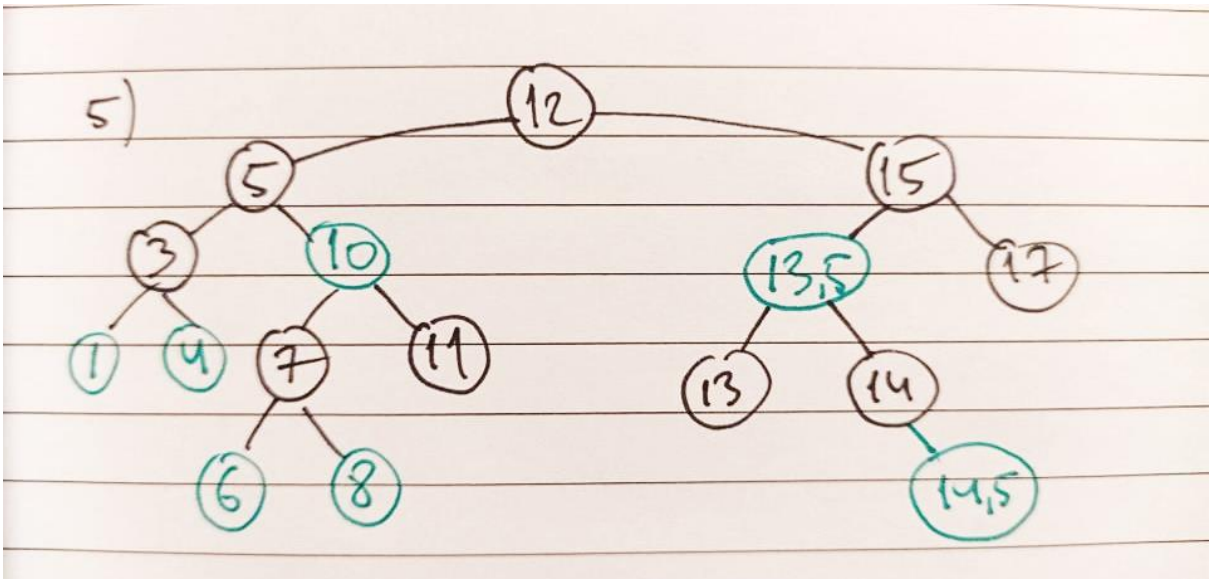
3. Double rotation result is below. Notice parent is black, and children are red.



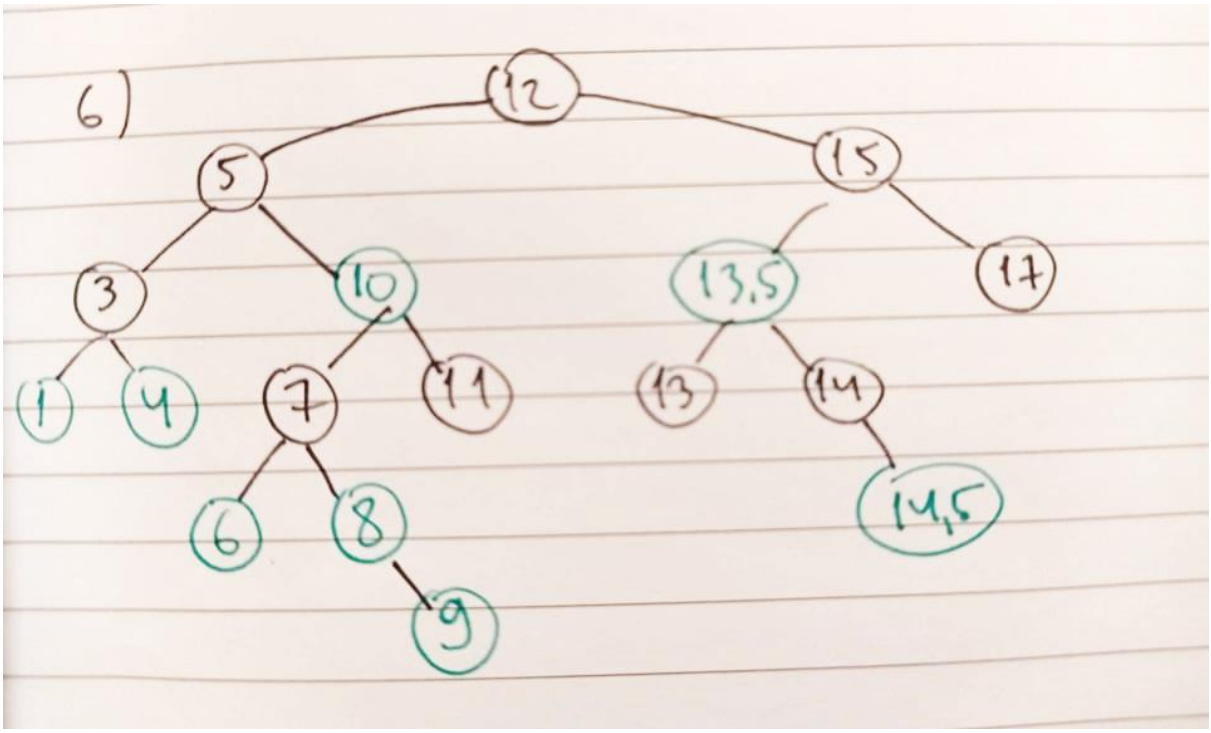
4. Add element 14.5 in corresponding position. But we can see 2 consecutive red nodes there.



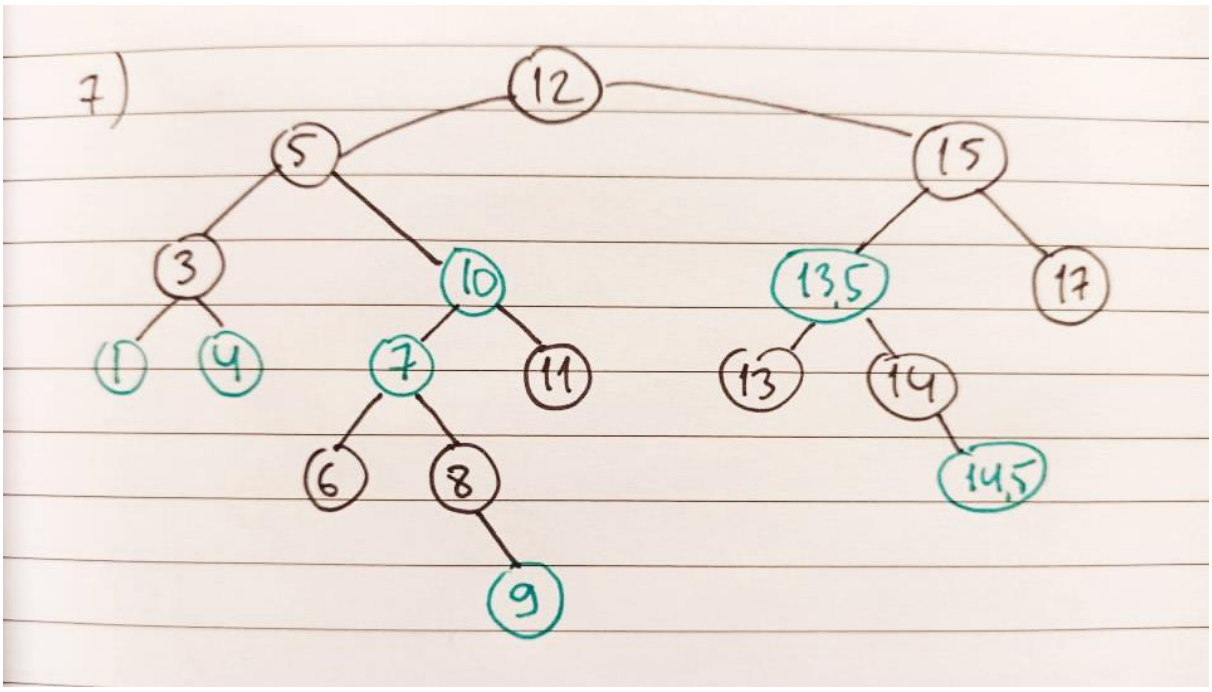
5. Since there is red uncle exist for 14.5, we push blackness of parent into children:



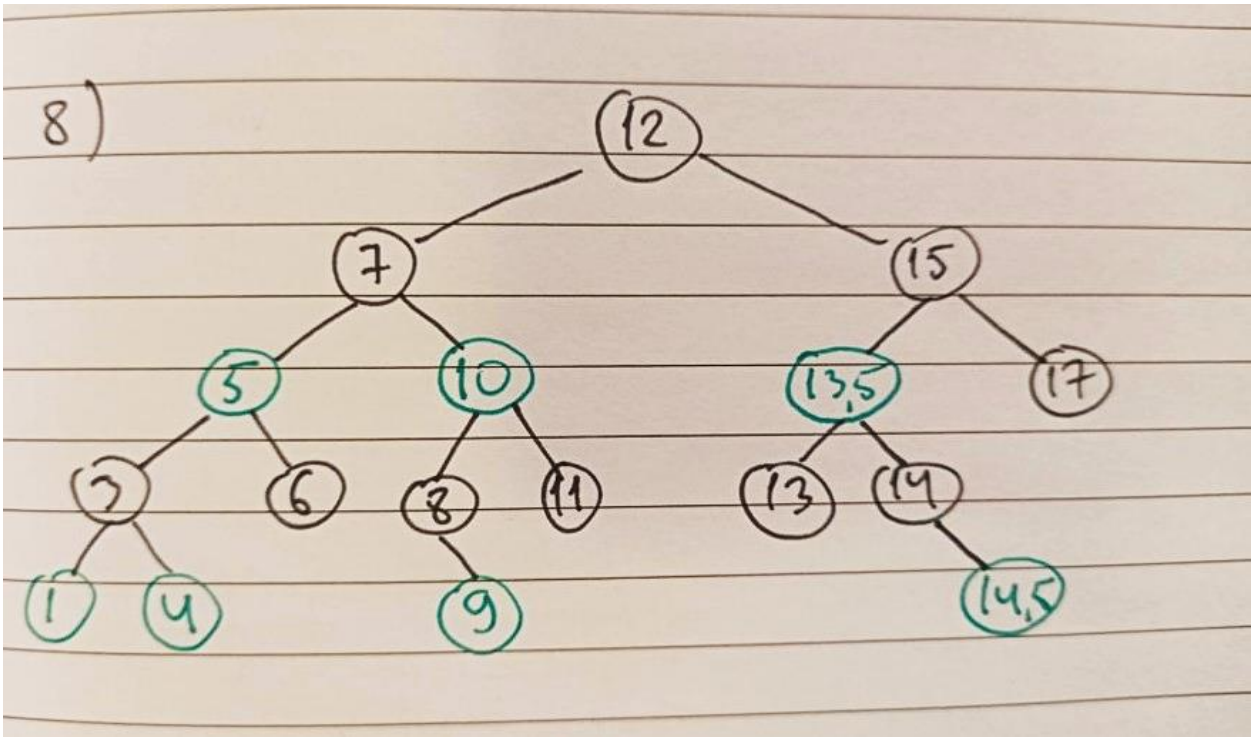
6. Now add element 9 finally. 9 has red uncle, thus we collapse grandparent black color into children and change grandparent color.



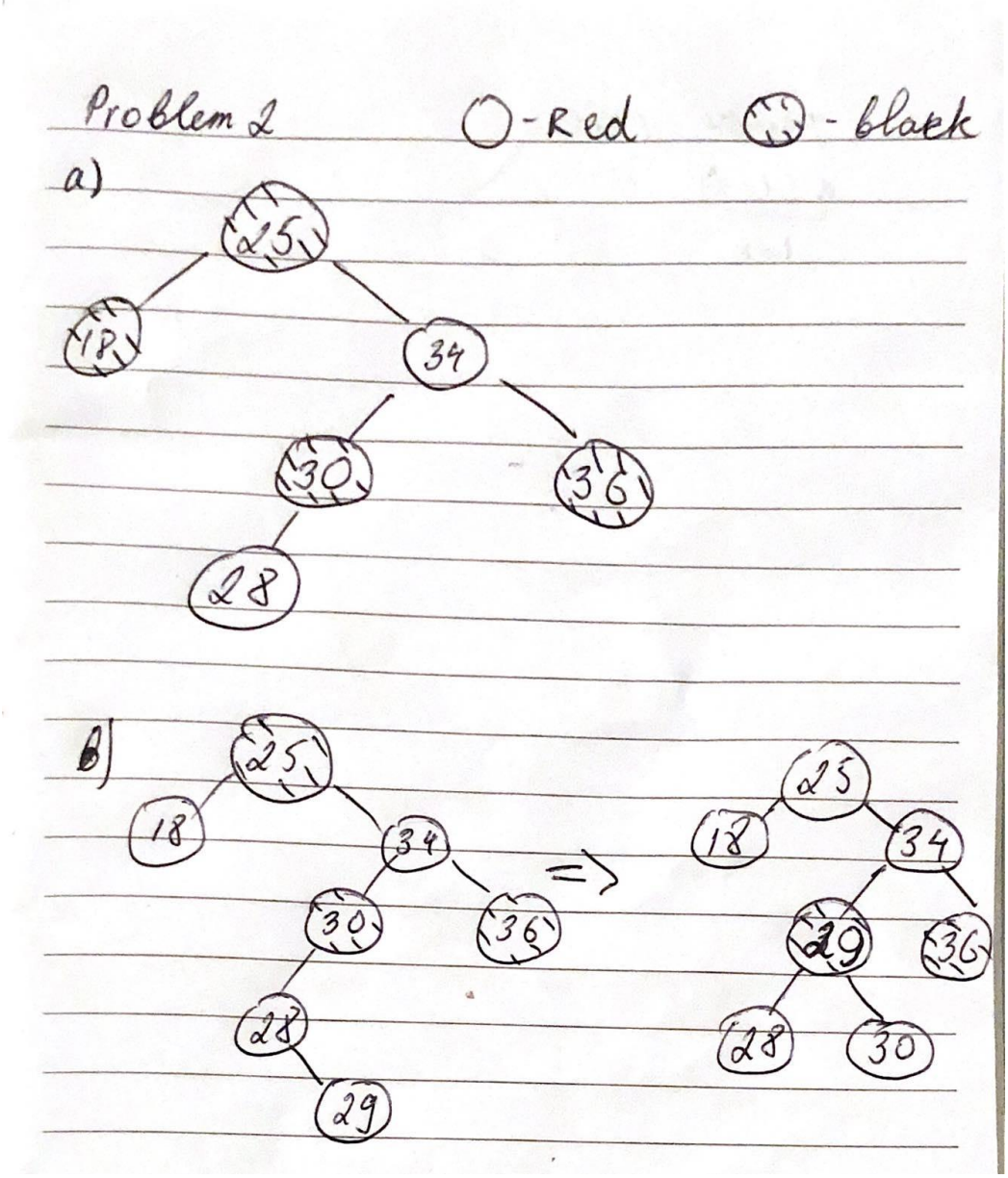
7. If we see 7 and 10, they are violating rule. We should double rotate on 5,10,7.



8. Double rotation done. And resulting final Red Black tree is shown below.



Part2:


Problem 2
O - Red
O - black
a)
25
18
34
30
36
28
b)
25
18
34
30
36
28
29
=>
25
18
34
29
36
28
30