Homework
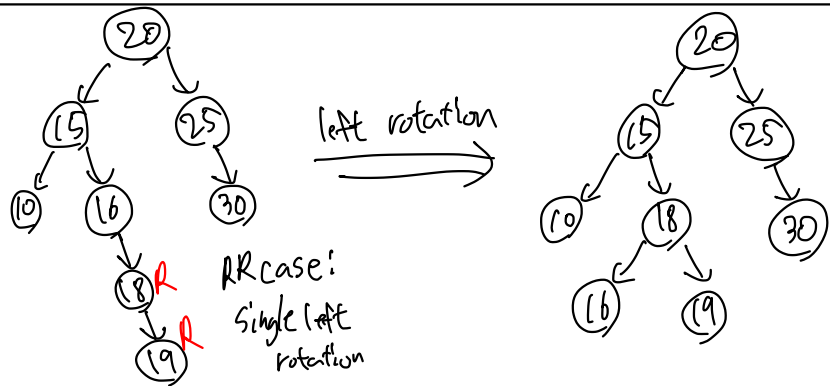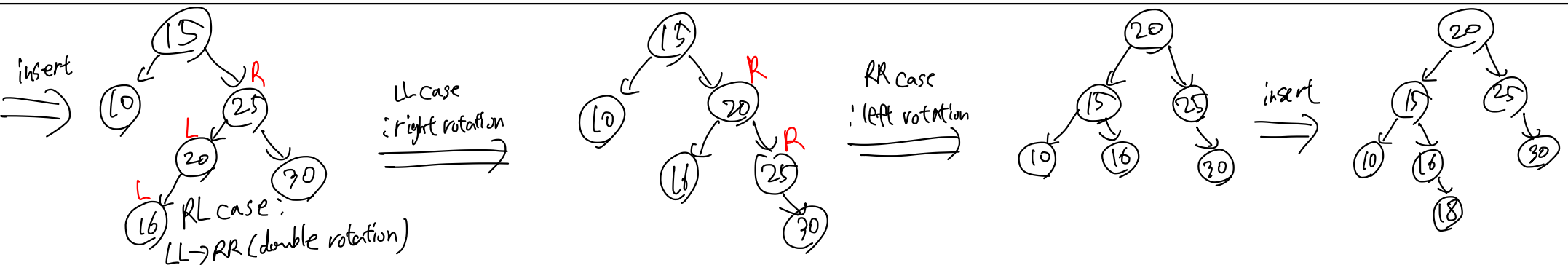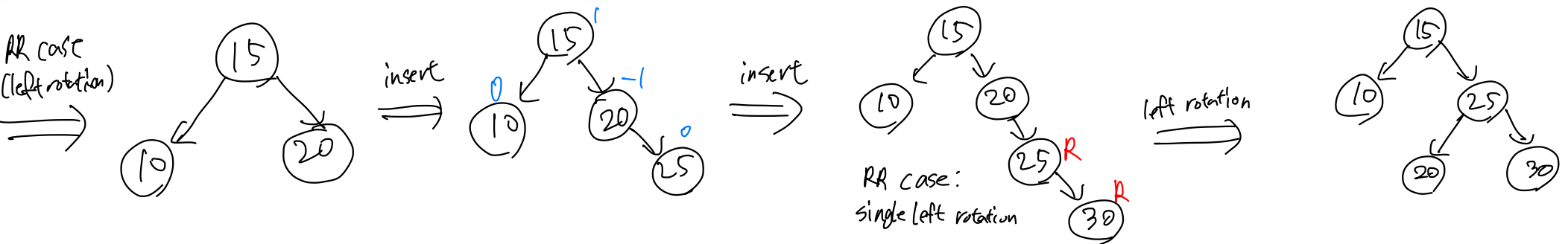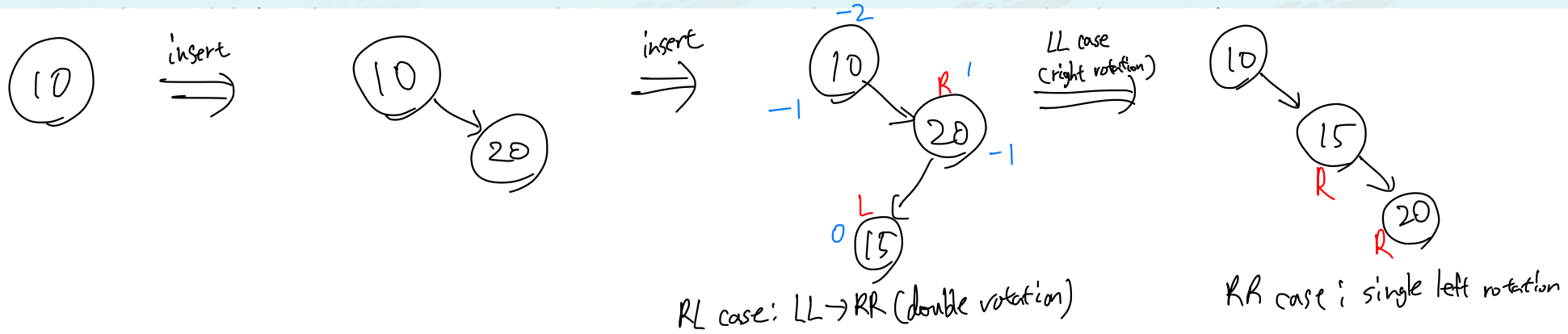
- Draw AVL trees whenever the tree changes its shape by insertion and deletion. Include trees before and after its rotation and the type of rotation.
- Tree가 모양을 **바꿀 때마다** AVL tree들을 그리고, 각 단계별로 LL, RR, LR, RL을 표시하여 제출하십시오.

(1) Insert the sequence of elements (10, 20, 15, 25, 30, 16, 18, 19) into an AVL tree.
Delete 30 in the AVL tree that you got above and rebalance it.

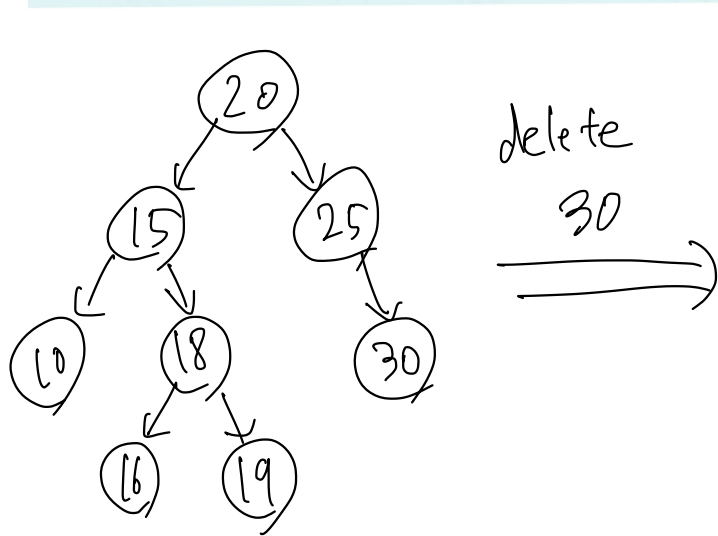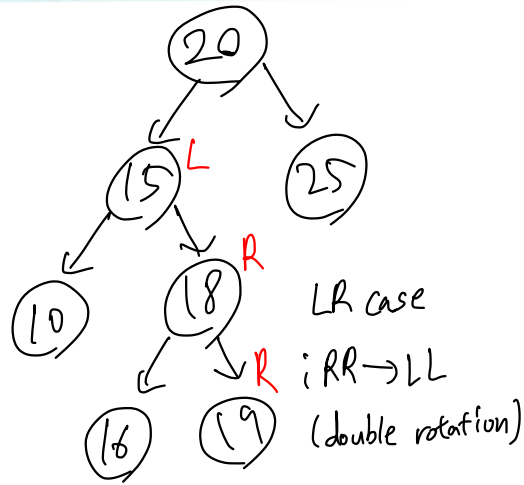(2) Delete 32 **in the AVL tree shown below** and rebalance it.

Check your answer with treex.exe.

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1

(1) Insert the sequence of elements (10, 20, 15, 25, 30, 16, 18, 19) into an AVL tree.

10 insert ⟹ 10 → 20

insert ⟹ -2 on 10, -1, 20 R 1, -1, L 0 15

RL case: LL→RR (double rotation)

LL case (right rotation) ⟹ 10 → 15 R → 20 R

RR case: single left rotation

RR case (left rotation) ⟹ 15, 10, 20

insert ⟹ 15 1, 0 10, -1 20, 0 25

insert ⟹ 15, 10, 20, 25 R, 30 R

RR case: single left rotation

left rotation ⟹ 15, 10, 25, 20, 30

insert ⟹ 15, 10, 25 R, L 20, 30, L 16

RL case: LL→RR (double rotation)

LL case: right rotation ⟹ 15, 10, 20, 16, 25 R, 30

RR case: left rotation ⟹ 20, 15, 25, 10, 16, 30

insert ⟹ 20, 15, 25, 10, 16, 30, 18 L

20, 15, 25, 10, 16, 30, 18 R, 19 R

RR case: single left rotation

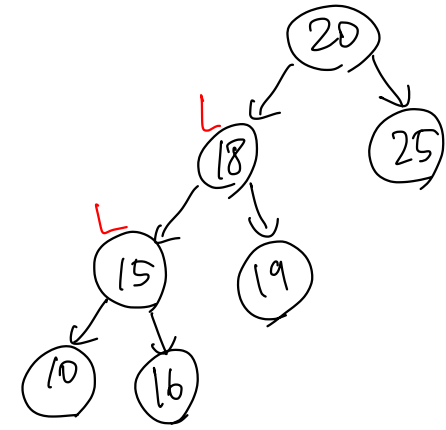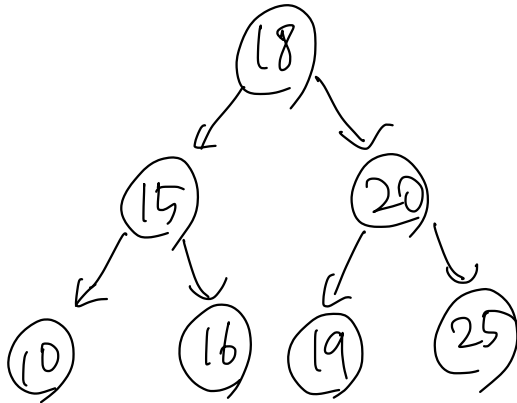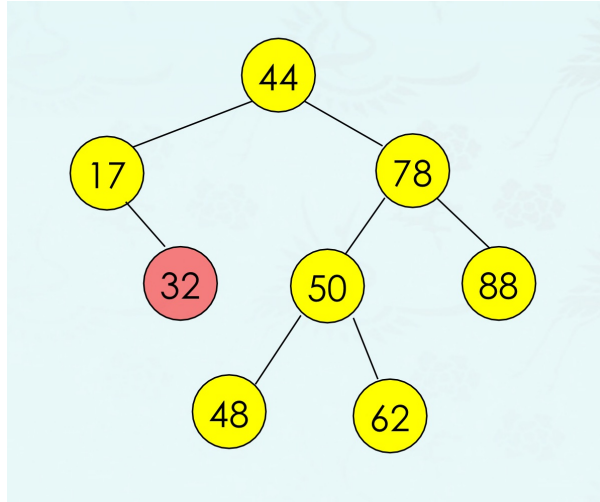left rotation ⟹ 20, 15, 25, 10, 18, 30, 16, 19

Delete 30 in the AVL tree that you got above and rebalance it.

delete
30

RR case
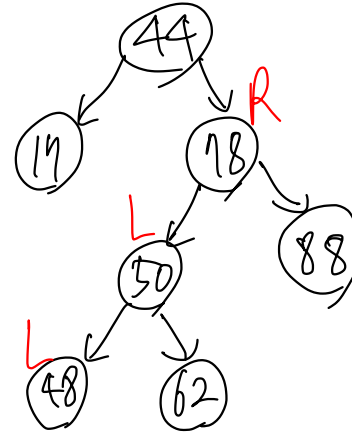; left rotation

L
LR case
; RR → LL
(double rotation)

LL case
; right rotation

(2) Delete 32 **in the AVL tree shown below** and rebalance it.
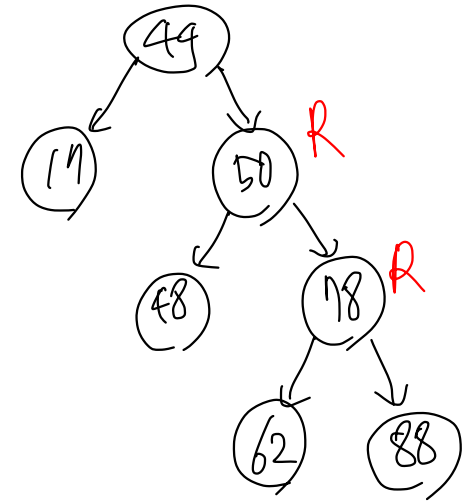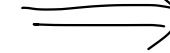

delete 32

RL case : LL → RR (double rotation)

LL case
: right rotation

RR case
: left rotation