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Assignment 4 – Balanced Search Trees

Question 1

All answers to this question were visualized using a digital note taking app. Below, I have included a directive which makes the visualization more understandable.
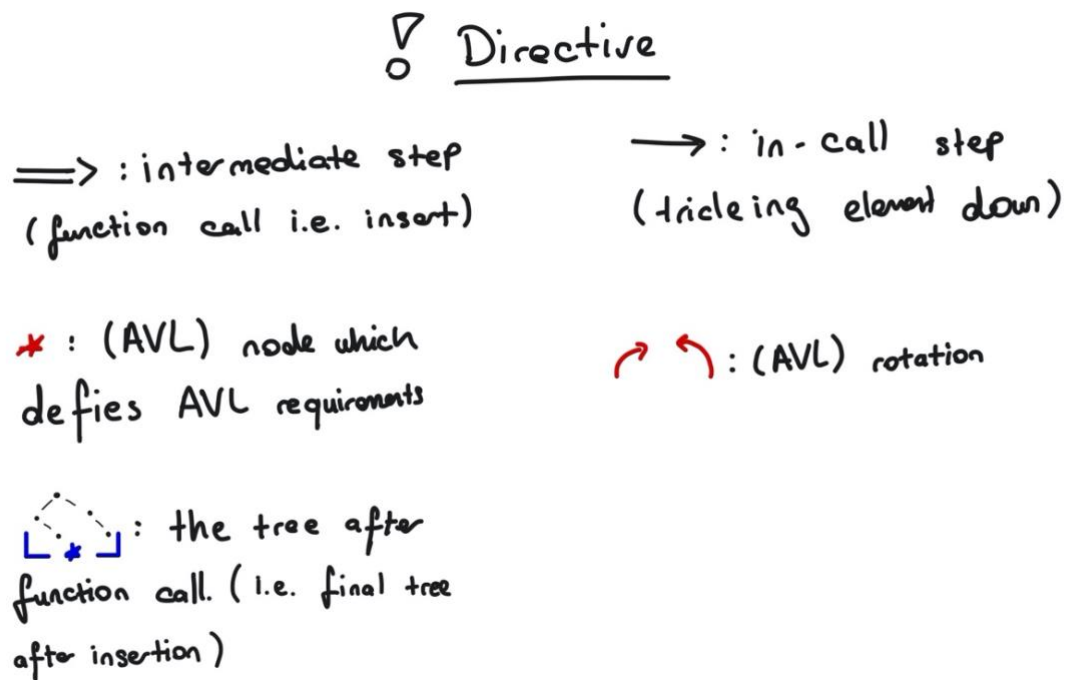
∇ Directive

$\Longrightarrow$: intermediate step
(function call i.e. insert)

$\longrightarrow$: in-call step
(tricleing element down)

$*$: (AVL) node which
defies AVL requirements

$\curvearrowright \curvearrowleft$: (AVL) rotation

$\lfloor \cdot_* \rfloor$: the tree after
function call. (i.e. final tree
after insertion)

Figure 1: Directive for the observation of given answers

Answers to parts a, b and c can be found on the next pages.

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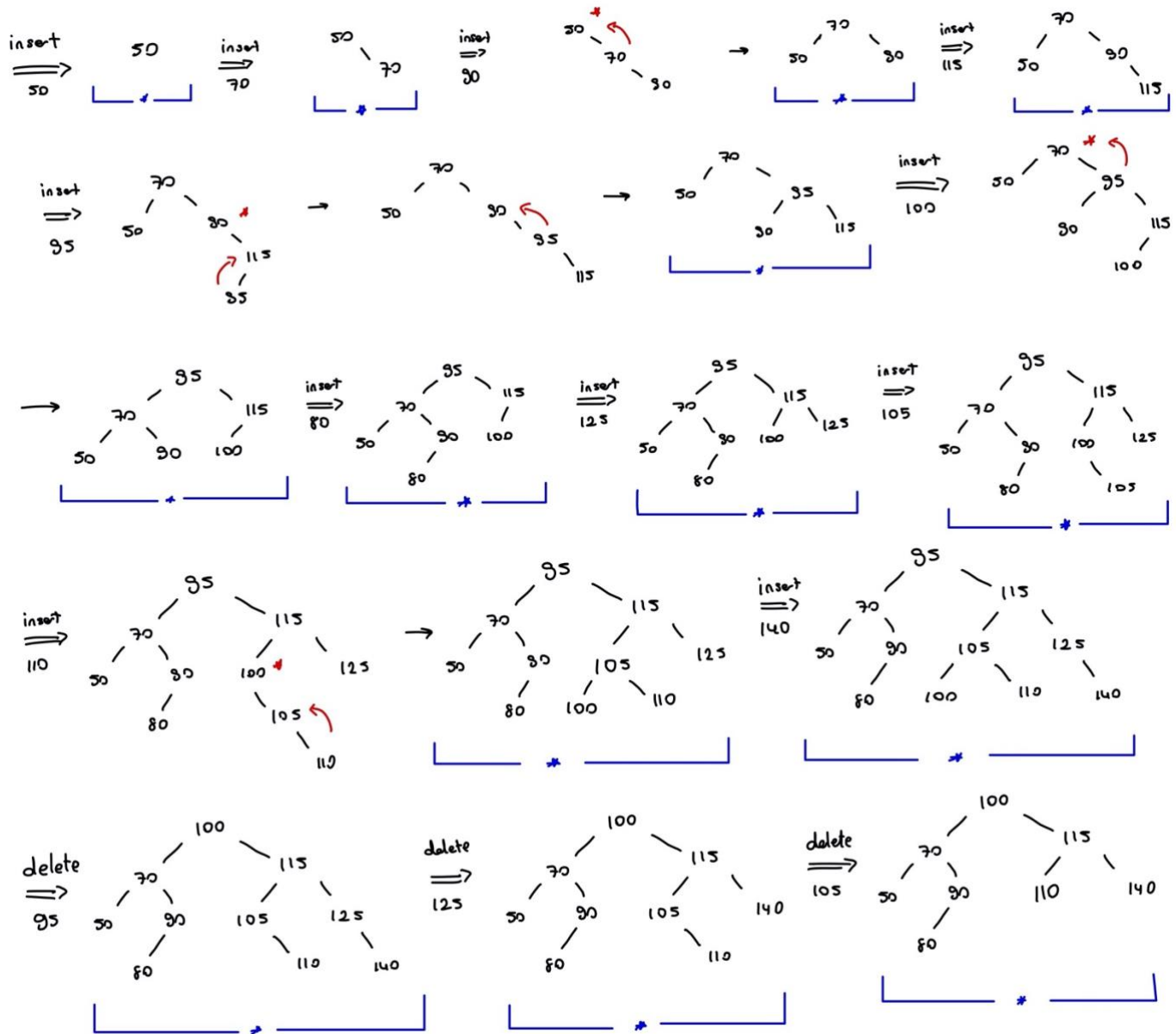a) Insertion and deletion of given elements into an AVL Tree

Figure 2: Answer to Q1.a

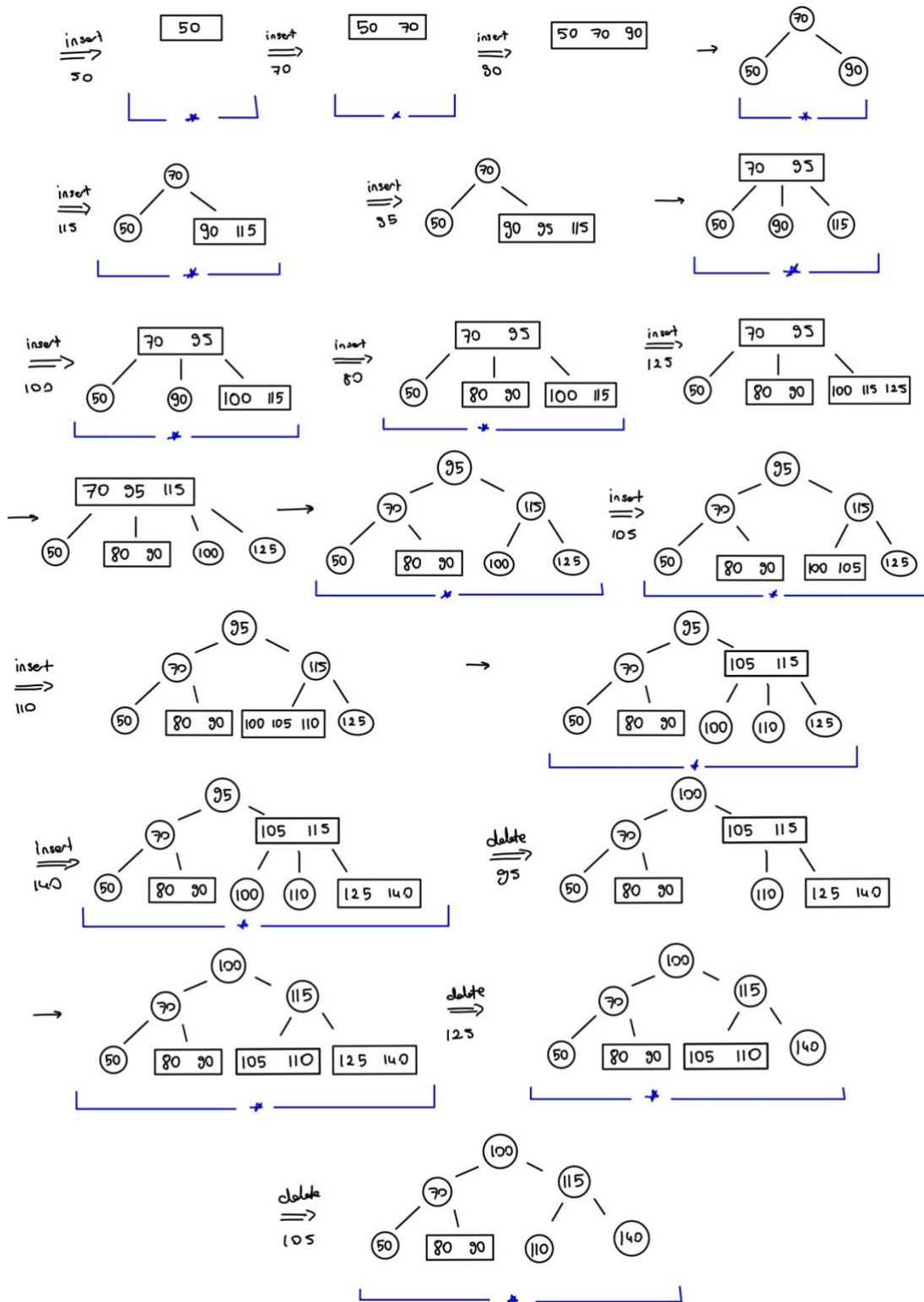b) Insertion and deletion of given elements into a 2-3 Tree

Figure 3: Answer to Q1.b

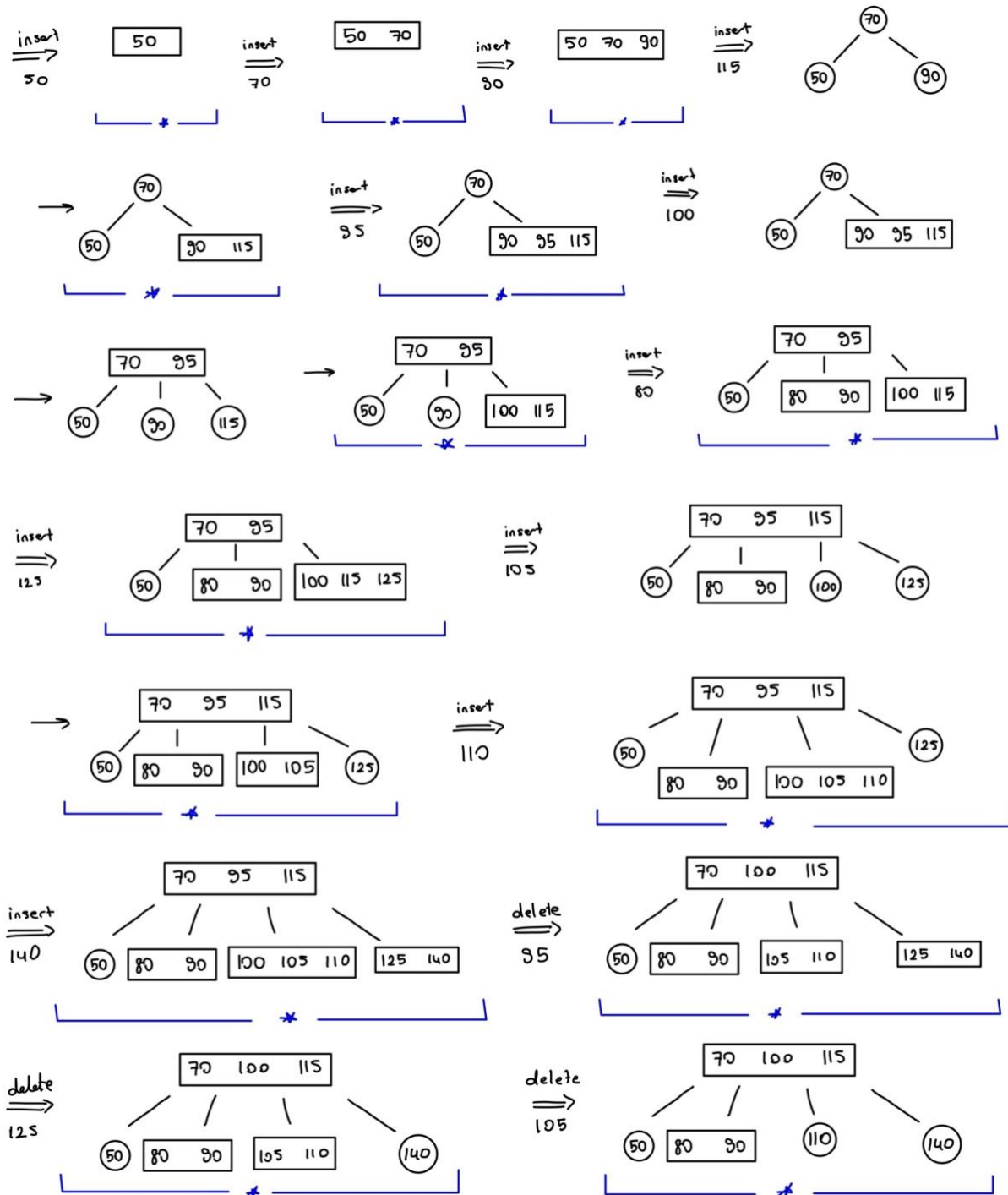c) Insertion and deletion of given elements into a 2-3-4 Tree

Figure 4: Answer to Q1.c