Institut für Pervasive Computing

Algorithms and Data Structures 2
Winter term 2023

Assignment 01

Deadline: **Wednesday November 08 2023, 23:59**
Submission via: **Moodle**

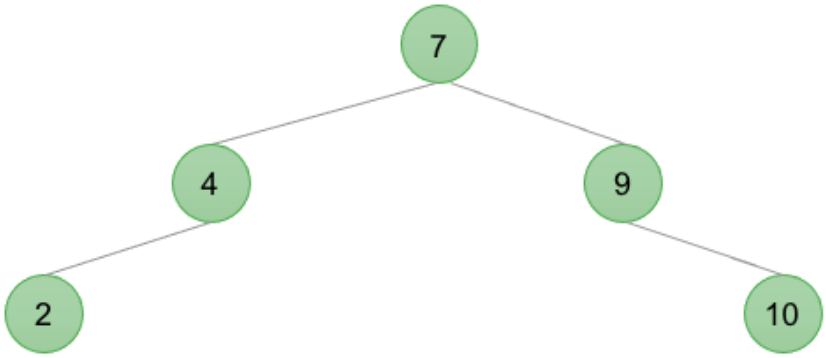
Time log

Remember the time you needed to implement your solution of this assignment and log it in the exercise specific survey in Moodle! This information is fully anonymous.

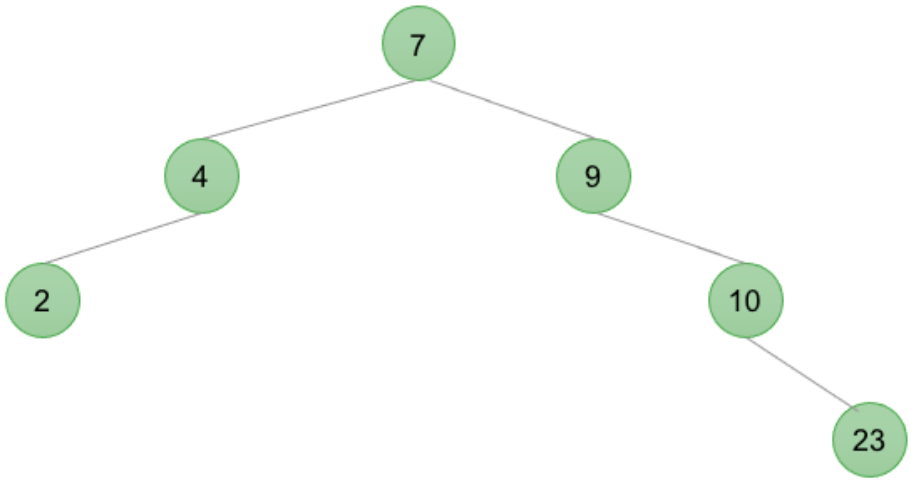
Trees

1. AVL Tree Classification — 0.5+0.5+0.5+0.5+0.5+0.5 points

Determine if the following trees are valid AVL trees:
Provide a justification for your answer
a.



b.



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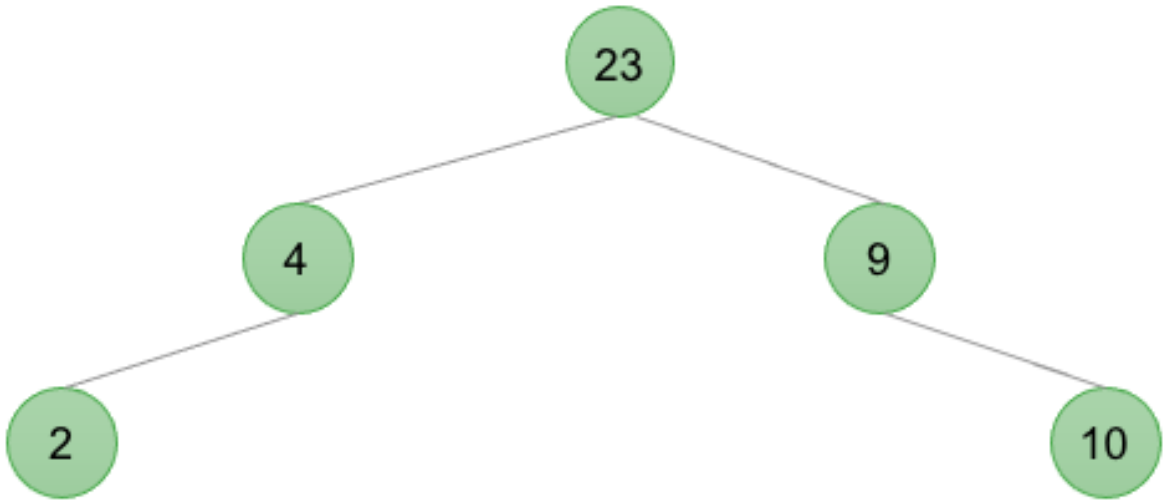
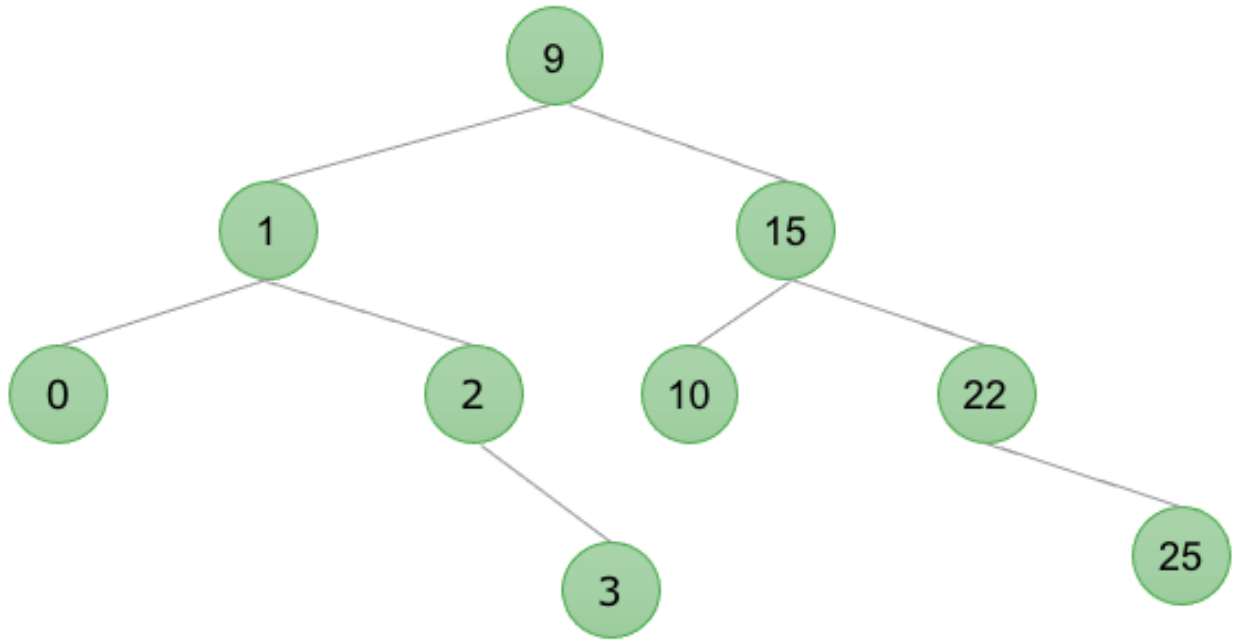
c.



d.



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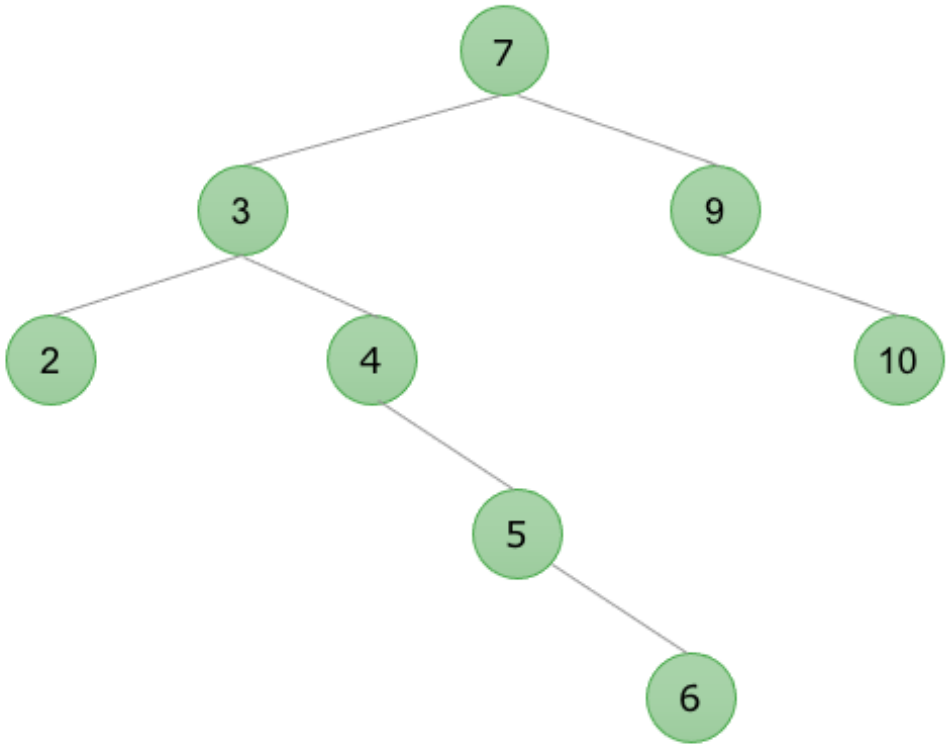
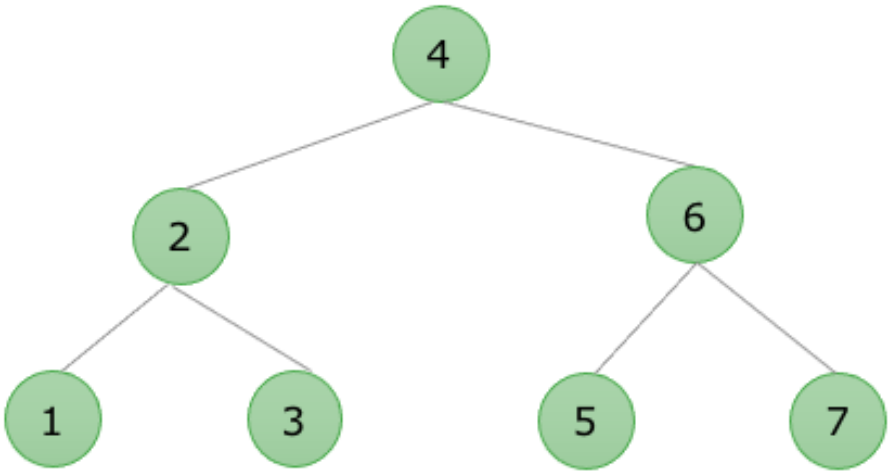
e.



f.



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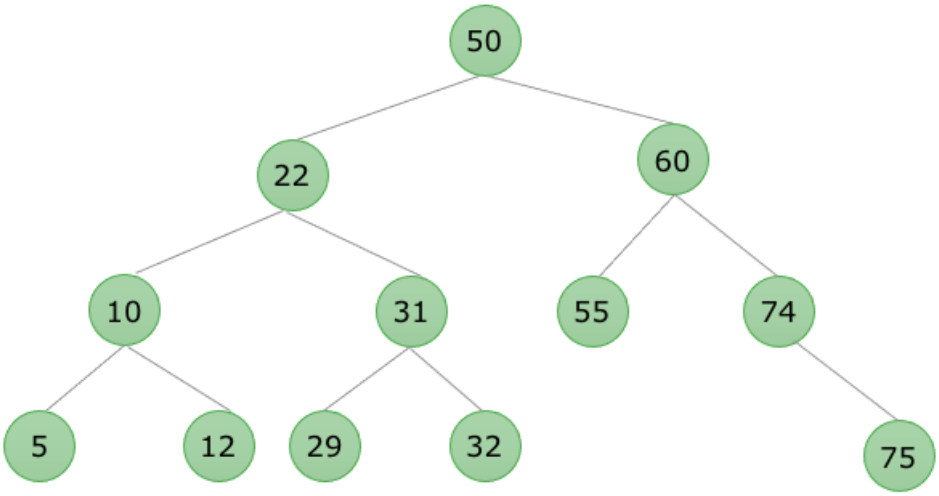
2. AVL Tree Insert — 6+3 points

a.
Starting with an empty tree, create an AVL where you insert the following sequence of numbers **(in this exact order):**

0, 5, 6, 10, 1, 2, 8

Provide all intermediate steps!
Each insert operation must terminate in a **valid** AVL tree!

b.
Into this given AVL tree insert a new node with key 33 and **afterwards** a new node with key 34:



Provide all intermediate steps!

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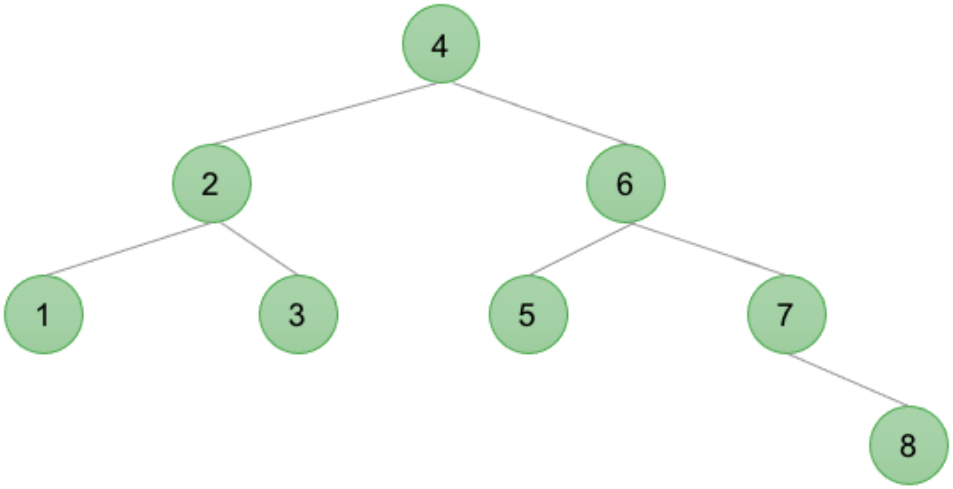
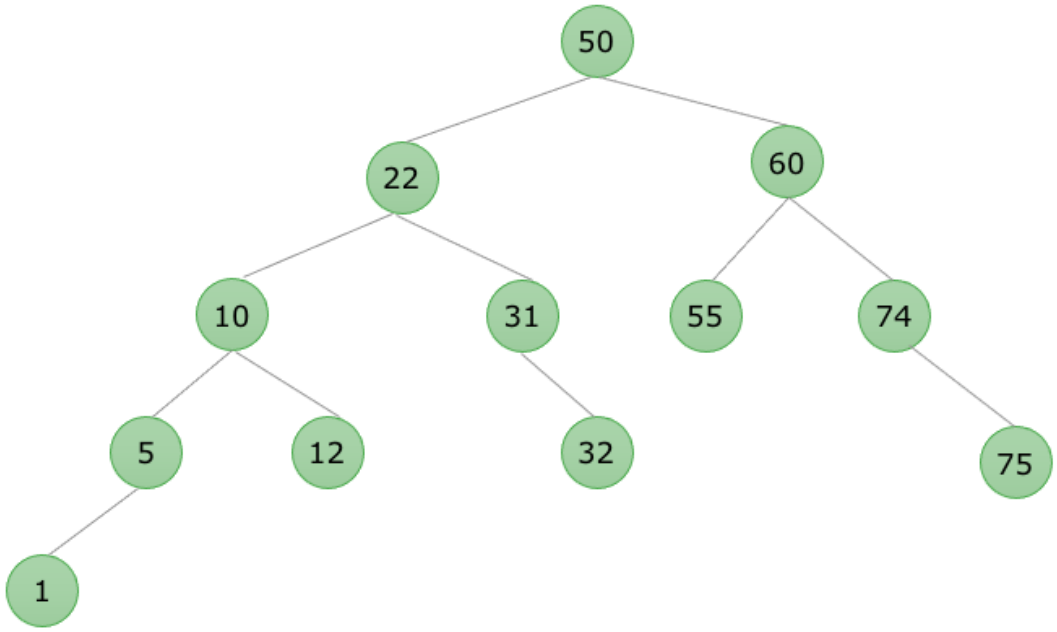
3. AVL Tree Remove — 4+4 points

a.
From this given AVL tree remove the node with key 4 (use the inorder successor to replace it):



Provide all intermediate steps!

b.
From this given AVL tree remove the node with key 22



Provide all intermediate steps!