

# Exercise 1: binary tree and heap

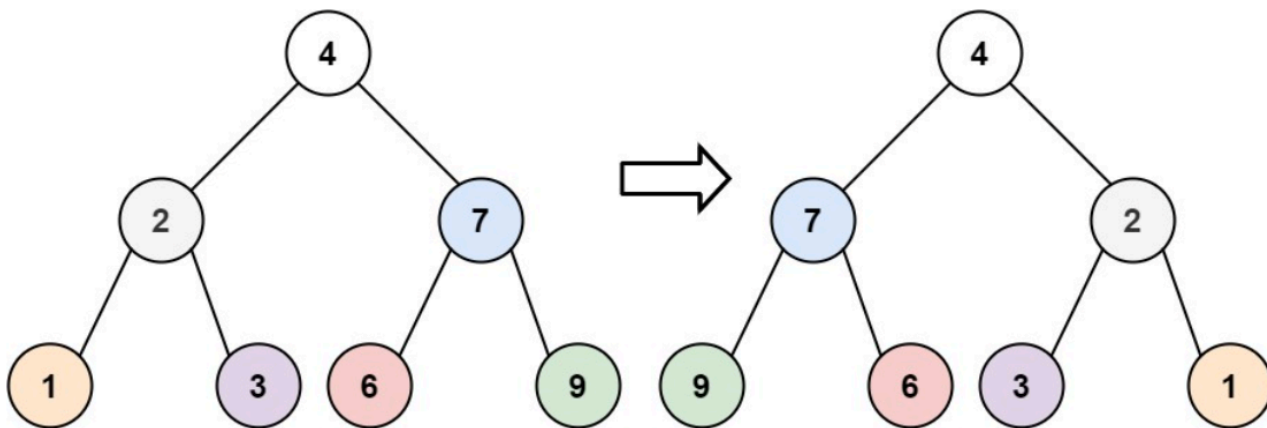
TA: Ren, Peng

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## Question 1:

1. What are the differences between in-order traversal and pre-order traversal in a binary tree?
2. The function below is intended to invert a binary tree, but it doesn't work correctly. Can you identify and correct the error(s)?

### Example 1:



**Input:** root = [4,2,7,1,3,6,9]

**Output:** [4,7,2,9,6,3,1]

```
// Image and question comes from leetcode: https://leetcode.com/problems/invert-binary-tree/
/**
 * Definition for a binary tree node.
 * struct TreeNode {
 *     int val;
 *     struct TreeNode *left;
 *     struct TreeNode *right;
 * };
 */

struct TreeNode* invertTree(struct TreeNode* root) {
```

```

if (root == NULL) {
    return NULL;
}

root->left = invertTree(root->right);
root->right = invertTree(root->left);

return root;
}

```

2. What is the time complexity of the corrected program?

## Question 2:

1. How do min-heaps differ from max-heaps?
2. Given the following array, draw the corresponding max heap on paper:

## Array representation

