Data Structures and Algorithms

Assignment - VI

1. AVL Tree Insertion:

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 File  Edit  View  Terminal  Tabs  Help
ryzen@MACHINE:~/Repo/DSA/6$ gcc AVL.c -o AVL
ryzen@MACHINE:~/Repo/DSA/6$ ./AVL

AVL Tree Operations:
1. Insert a node
2. Delete a node
3. Check if tree is AVL
4. Find the height of the tree
5. Convert a sorted array to AVL tree
6. Count nodes at a given level
7. Exit
Enter your choice: 1
Enter key to insert: 23

AVL Tree Operations:
1. Insert a node
2. Delete a node
3. Check if tree is AVL
4. Find the height of the tree
5. Convert a sorted array to AVL tree
6. Count nodes at a given level
7. Exit
Enter your choice: 1
Enter key to insert: 34
```

2. AVL Tree Deletion:

```
AVL Tree Operations:                    2
1. Insert a node
2. Delete a node
3. Check if tree is AVL
4. Find the height of the tree
5. Convert a sorted array to AVL tree
6. Count nodes at a given level
7. Exit
Enter your choice: 2
Enter key to delete: 676
```

3. Check if a Tree is AVL:

```
AVL Tree Operations:
1. Insert a node
2. Delete a node
3. Check if tree is AVL
4. Find the height of the tree
5. Convert a sorted array to AVL tree
6. Count nodes at a given level
7. Exit
Enter your choice: 3
The tree is AVL.
```

4. Find the Height of an AVL Tree:

```
AVL Tree Operations:
1. Insert a node
2. Delete a node
3. Check if tree is AVL
4. Find the height of the tree
5. Convert a sorted array to AVL tree
6. Count nodes at a given level
7. Exit
Enter your choice: 4
The height of the tree is: 4
```

5. Convert Sorted Array to AVL Tree:

```
AVL Tree Operations:
1. Insert a node
2. Delete a node
3. Check if tree is AVL
4. Find the height of the tree
5. Convert a sorted array to AVL tree
6. Count nodes at a given level
7. Exit
Enter your choice: 5
Enter the size of the sorted array: 20
Enter the sorted array elements:
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Sorted array converted to AVL tree.
```

6. Count Nodes at Level in AVL Tree:

```
AVL Tree Operations:
1. Insert a node
2. Delete a node
3. Check if tree is AVL
4. Find the height of the tree
5. Convert a sorted array to AVL tree
6. Count nodes at a given level
7. Exit
Enter your choice: 6
Enter the level to count nodes: 4
Number of nodes at level 4: 8
```

7. AVL Tree Rotations:

```
File  Edit  View  Terminal  Tabs  Help
ryzen@MACHINE:~/Repo/DSA/6$ gcc AVL-R.c -o AVLR
ryzen@MACHINE:~/Repo/DSA/6$ ./AVLR

AVL Tree Rotation Functions:
1. Right Rotate
2. Left Rotate
3. Display Tree
4. Exit
Enter your choice:
```