Experiment6

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SubjectName: APLab-2 SubjectCode: 22CSP-351

1. Aim:Symmetric Tree

2. Objective:

Giventherootofabinarytree, *checkwhetheritisamirrorofitself* (i.e., symmetric around its center).

3. Implementation/Code:

```
boolhelp(TreeNode*r1,TreeNode*r2){ if(r1 ==
       NULL and r2 == NULL){
           returntrue;
       if(r1==NULLandr2!=NULL){
           returnfalse;
       if(r1!=NULLandr2==NULL){
           returnfalse;
       if(r1->val!=r2->val){ return
           false;
       }
       boolone=help(r1->left,r2->right);
       booltwo=help(r1->right,r2->left);
       boolans=one&two;
       returnans;
   bool isSymmetric(TreeNode* root) {
       returnhelp(root->left,root->right);
   }
```

4. Output

Accepted	Runtime: 0 ms
• Case 1	• Case 2
Input	
root = [1,2,2,3,4	,4,3]
Output	
true	
Expected	
true	
Accepted	Runtime: 0 ms
• Case 1	• Case 2
• Case 1	• Case 2
Input root =	• Case 2
Input root =	
root = [1,2,2,nu	
Input root = [1,2,2,nu Output	

5. LearningOutcome:

- i. WeLearnAbouttheuseofReccursion.
- ii. WeLearnAbouttheuseofListNode.
- iii. WeLearnAbouttheuseofBaseCases.
- iv. WelearnAbouttheCallingfunctionin recc..

Question 2

1. Aim:-KthSmallestElementinaBST

2. Objective:-

Giventherootofabinarysearchtree, and an integerk, return the kth smallest value (**1-indexed**) of all the values of the nodes in the tree.

3. Implementation/Code:-

```
voidhelp(TreeNode*root,vector<int>&ans){
    if(root == NULL){
        return;
    }
    help(root->left,ans);
    ans.push_back(root->val);
    help(root->right,ans);
}
intkthSmallest(TreeNode*root,intk){
    vector<int>ans;
    help(root,ans);

    returnans[k-1];
}
```



4. Output:-

	Accepted Runtime: 0 ms
Accepted Runtime: 0 ms	• Case 1 • Case 2
• Case 2	Input
Input	root =
root = [3,1,4,null,2]	[5,3,6,2,4,null,null,1]
k = 1	k = 3
Output	Output
1	3
Expected	Expected
1	3

5. LearningOutcome:

- 1. WeLearnabouttheinordertraversal
- 2. WeLearnaboutthefunctioncalls
- 3. Welearnedaboutrecursion.

Question 3

6. A im:- ConvertSortedArray toBinarySearchTree

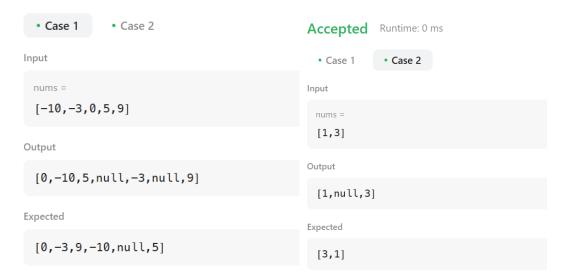
7. Objective:-

Givenanintegerarraynumswheretheelementsaresorted in **ascendingorder**, convert*ittoaheight-balancedbinarysearch tree*.

8. Implementation/Code:-

9. Output:-

Accepted Runtime: 0 ms





10. Learning Outcome:

- Welearnabouttocreateanewnode.
- Welearnaboutfunctioncalls.
- $\bullet \ \ We learn about the top ush middle value.$
- Welearntomakeatreefrom recc.