University of Management and Technology, Lahore

Estd. 1990

Quiz #2 – FALL 2023

Course Title	Data Structure and Algorithms Lab		Course Code	CC2042L	Credit Hours	01
Instructor	Hafiz Abdul Rehman		Program	BS Computer Science		
Date	26/12/2023	Section	V1	Maximum Marks		20
Student's Name			Student ID			

Q1: Implement a function to create a binary tree using the array [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15] (CLO 3) **[05]**

```
node *create_node(int value)
	{
		node *newnode = new node(value);
		newnode->left = NULL;
		newnode->right = NULL;
		return newnode;

	}

	node* insert(node* root , int value)
	{
		if (root==NULL)
		{
			return create_node(value);
		}
		else
		{
			if (value < root->data)
			{
				root->left = insert(root->left, value);
			}
			else
			{
				root->right = insert(root->right, value);
			}
			return  root;
		}
	}
```

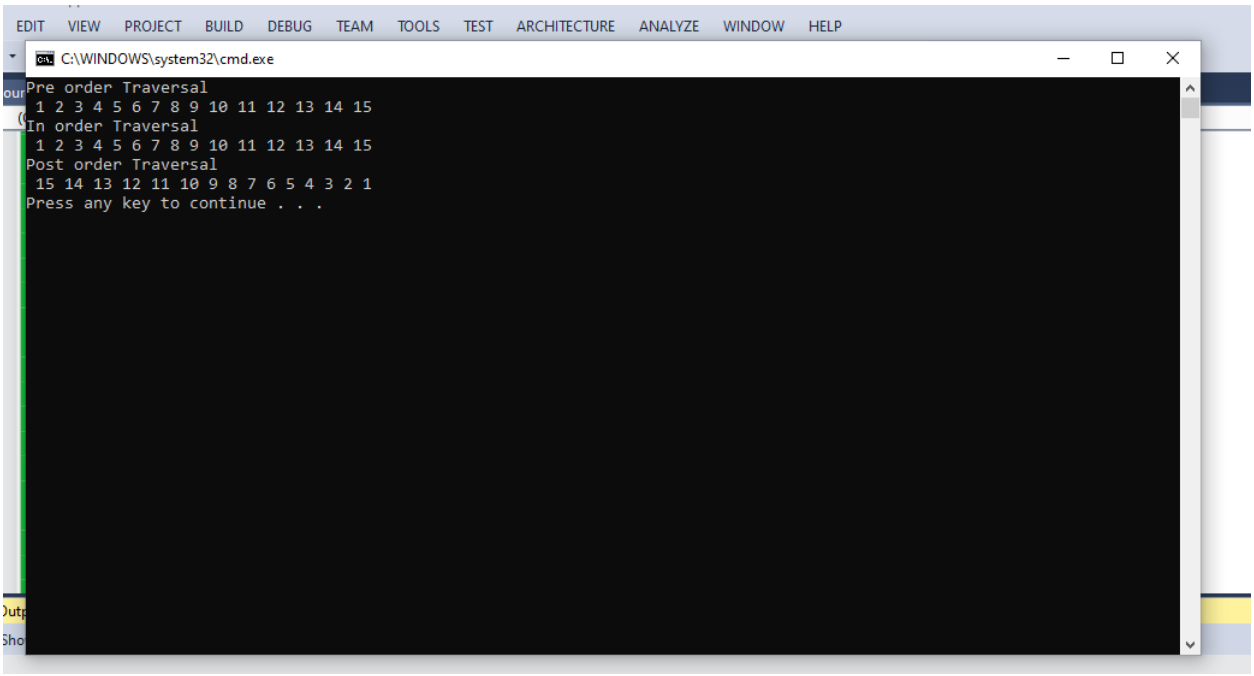
Q1: Traverse the created tree using the traversing techniques (In Order, Pre Order, Post Order) (CLO 3) [15]

```
#include<iostream>
using namespace std;
class node
{
public :
```

```
        node *left, *right; int data;
        node(int d)
        {
                left = NULL;
                right = NULL;
                data = d;
        }
};
class Binary_Trees
{
public :

        node *create_node(int value)
        {
                node *newnode = new node(value);
                newnode->left = NULL;
                newnode->right = NULL;
                return newnode;

        }

        node* insert(node* root , int value)
        {
                if (root==NULL)
                {
                        return create_node(value);
                }
                else
                {
                        if (value < root->data)
                        {
                                root->left = insert(root->left, value);
                        }
                        else
                        {
                                root->right = insert(root->right, value);
                        }
                        return  root;
                }
        }
        void pretorder_traversal(node*root_temp)
        {

                if (root_temp != NULL)
                {
                        cout << " " << root_temp->data;
                        pretorder_traversal(root_temp->left);
                        pretorder_traversal(root_temp->right);
                }

        }

        void postorder_traversal(node*root_temp)
        {

                if (root_temp != NULL)
                {
                        postorder_traversal(root_temp->left);
```

```
                postorder_traversal(root_temp->right);
                cout << " " << root_temp->data;
        }

    }

    void inorder_traversal(node*root_temp)
    {

        if (root_temp != NULL)
        {
            inorder_traversal(root_temp->left);
            cout << " " << root_temp->data;
            inorder_traversal(root_temp->right);

        }

    }
};
int main()
{
    cout << "Muhammad Zeeshan\nf2022266312\nBSCS\nV-1\nDSA LAB" << endl;
    Binary_Trees obj1;
    node* root=NULL;
    int arr[] = { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 };
    int size = sizeof(arr) / sizeof(arr[0]);


    for (int i = 0; i < size; i++)
    {
        root=obj1.insert(root, arr[i]);
    }


    cout << "Pre order Traversal" << endl;
    obj1.pretorder_traversal(root);
    cout << endl;


    cout << "In order Traversal";
    cout << endl;
    obj1.inorder_traversal(root);
    cout << endl;


    cout << "Post order Traversal" << endl;
    obj1.postorder_traversal(root);
    cout << endl;

    return 0;
}
```

OUTPUT


EDIT VIEW PROJECT BUILD DEBUG TEAM TOOLS TEST ARCHITECTURE ANALYZE WINDOW HELP
C:\WINDOWS\system32\cmd.exe
Pre order Traversal
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
In order Traversal
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Post order Traversal
15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Press any key to continue . . .