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Data Structures and algorithms (CS09203)

Lab Report

Name: Usman Alil
Registration #: SEU-F16-135
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Submitted To: Mr. Usman Ahmed

The University of Lahore, Islamabad Campus
Department of Computer Science & Information Technology

Experiment # 9

DFS Graph and its representationsl

Objective

The objective of this session is to show the representation of graphs using C++.

Software Tool

1. Code Blocks with GCC compiler.

1 Theory

Depth First Traversal (or Search) for a graph is similar to Depth First Traversal of a tree. The only catch here is, unlike trees, graphs may contain cycles, so we may come to the same node again. To avoid processing a node more than once, we use a boolean visited array.

2 Task

2.1 Task 1

Impeiment Depth First Traversal (or Search) for a graph.

2.2 Procedure: Task 1

```
#include<iostream>
using namespace std;
struct node{
    char data;
    struct node* left;
    struct node* right;
};
```

```

void Preorder(struct node *root){
    if(root == NULL)        return;
    cout<<root->data<<" ";
    Preorder(root->left);
    Preorder(root->right);
}

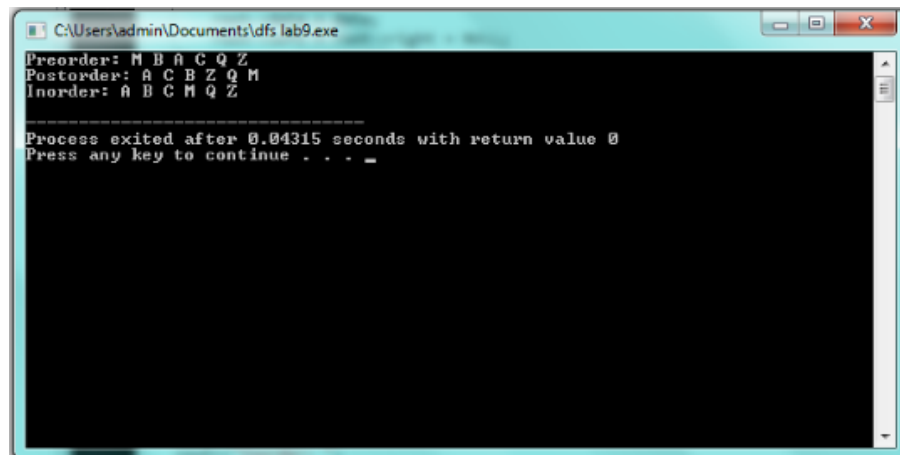
void Inorder(struct node *root){
    if(root == NULL)        return;
    Inorder(root->left);
    cout<<root->data<<" ";
    Inorder(root->right);
}

void Postorder(struct node *root){
    if(root == NULL)        return;
    Postorder(root->left);
    Postorder(root->right);
    cout<<root->data<<" ";
}

node* Insert(node *root, char data){
    if(root == NULL){
        root = new node();
        root->data = data;
        root->left = root->right = NULL;
    }
    else if(data <= root->data)
        root->left = Insert(root->left, data);
    else
        root->right = Insert(root->right, data);
    return root;
}

int main(){
    node* root = NULL;
    root = Insert(root, 'M');          root = Insert(root, 'B');
    root = Insert(root, 'Q');          root = Insert(root, 'Z');
    root = Insert(root, 'A');          root = Insert(root, 'C');
}

```



```
C:\Users\admin\Documents\dfs lab9.exe
Preorder: M B A C Q Z
Postorder: A C B Z Q M
Inorder: A B C M Q Z

Process exited after 0.04315 seconds with return value 0
Press any key to continue . . . _
```

Figure 1: output

```
    cout<<"Preorder: ";
    Preorder(root);
    cout<<"\n";
    cout<<"Postorder: ";
    Postorder(root);
    cout<<"\n";
    cout<<"Inorder: ";
    Inorder(root);
    cout<<"\n";
}
```