# Data Structures and algorythm (CS09203)

## Lab Report

| | |
|---|---|
| Name: | MuhammadTalhaKhalid |
| Registration #: | CSU-S16-135 |
| Lab Report #: | 9 |
| Dated: | 13-04-2018 |
| Submitted To: | Mr. Usman Ahmed |

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

# Experiment # 9
# Depthh First Search in graph

**Objective**
To understand How Impliment Depth First Search in graph.

**Software Tool**
1.Windows 10
2. Miktex
3. Dev C++

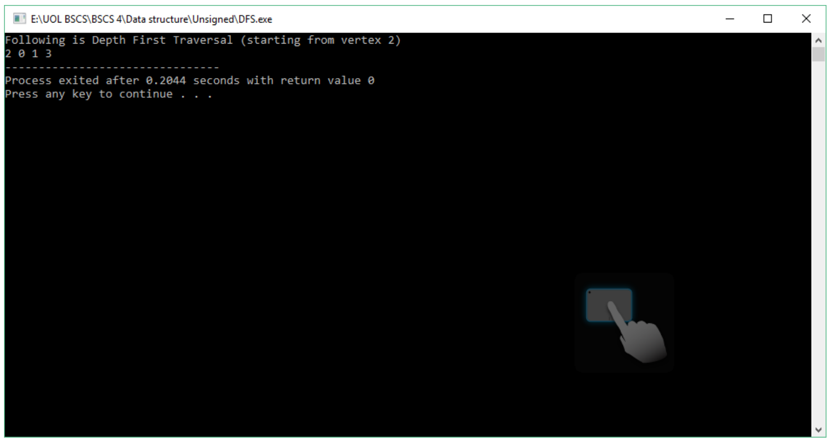
## 1 Theory

In this experiment we learn about Depth first search in an vector class whichis more like array but it has n fix size and
It has no memory leaks because it will automaticly go to next certix if your Given dta is not there and will not search for it forever

## 2 Task

### 2.1 Procedure: Task 1

We have Created a class name Graph we add Vertices 'V' and edges v and w we have created an Adjesent template pointer which actully check the direction of vector
in Depth first serch vertice 2 is a starting point the location where we want to enter our value and the data we want to put
in my case i enter 1 and 2 at locationn 0, 2 at location 1, 0 and 3 at location 2 and 3 at location 3



E:\UOL BSCS\BSCS 4\Data structure\Unsigned\DFS.exe

```
Following is Depth First Traversal (starting from vertex 2)
2 0 1 3
--------------------------------
Process exited after 0.2044 seconds with return value 0
Press any key to continue . . .
```

Figure 1: Enter data into different location of vertices

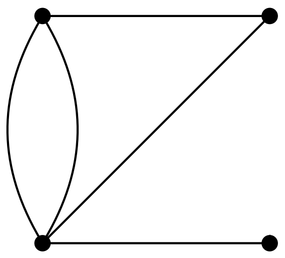
## 2.2 Procedure: Task 2

```
#include<stdio.h>
#include<iostream>
#include<dos.h>
#include<unistd.h>
#include<string>
#include<stdlib.h>
#include<menu.h>
#include <list>
using namespace std;
class Graph {
private:
int V;
list <int >*adj;
void DFSUtil(int v, bool visited[]);
public:
 Graph(int k);
void addEdge(int v, int w);
void DFS(int v);
};
Graph::Graph(int k) {
   this->V = k;
  adj = new list<int>[V];
}


void Graph::addEdge(int v, int w)
{
    adj[v].push_back(w);
}

void Graph::DFSUtil(int v, bool visited[])
{
    visited[v] = true;
    cout << v << " ";
    list<int>::iterator i;
    for (i = adj[v].begin(); i != adj[v].end(); ++i)
        if (!visited[*i])
            DFSUtil(*i, visited);
}
void Graph::DFS(int v)
{
    bool *visited = new bool[V];
    for (int i = 0; i < V; i++)
        visited[i] = false;
    DFSUtil(v, visited);
}
int main()
{
  Graph g(4);
    g.addEdge(0, 1);
    g.addEdge(0, 2);
    g.addEdge(1, 2);
    g.addEdge(2, 0);
    g.addEdge(2, 3);
    g.addEdge(3, 3);
    g.DFS(2);
return 0;
}
```

## 3 Graph



## 4 Conclusion

So in this Experiment we learn how to store our data into different location and search for it using concept of DFS Deapth fiirst search it is quiet usefull in data structures and to create a maze teleportation in games and menipulate our large ammount of data it is also use in Machine learning and Artificial intelligence.