CHANDIGARH UNIVERSITY

UNIVERSITY INSTITUTE OF NGINEERING
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Submitted By: Vivek Kumar(21BCS8129)	**Submitted To:** Neha Dutta(E12830)
Subject Name	Design and Analysis of Algorithm Lab
Subject Code	20CSP-312
Branch	Computer Science and Engineering
Semester	5th

Experiment - 8

Student Name: Vivek Kumar **UID: 21BCS8129**
Branch: BE-CSE(LEET) **Section/Group: 20BCS-WM-616/A**
Semester: 5th **Date of Performance: 07/11/2022**
Subject Name: DAA Lab **Subject Code: 20CSP-312**

1. Aim/Overview of the practical:

Code and analyse to do a depth-first search (DFS) on an undirected graph. Implementing an application of DFS such as (i) to find the topological sort of a directed acyclic graph, OR (ii) to find a path from source to goal in a maze.

2. Task to be done/ Which logistics used:

Code and analyse to do a depth-first search (DFS) on an undirected graph. Implementing an application of DFS such as (i) to find the topological sort of a directed acyclic graph, OR (ii) to find a path from source to goal in a maze.

3. Requirements (For programming-based labs):

- Laptop or PC.
- Operation system (Mac, Windows, Linux, or any)
- Vs-Code with MinGw or any C++ Compiler

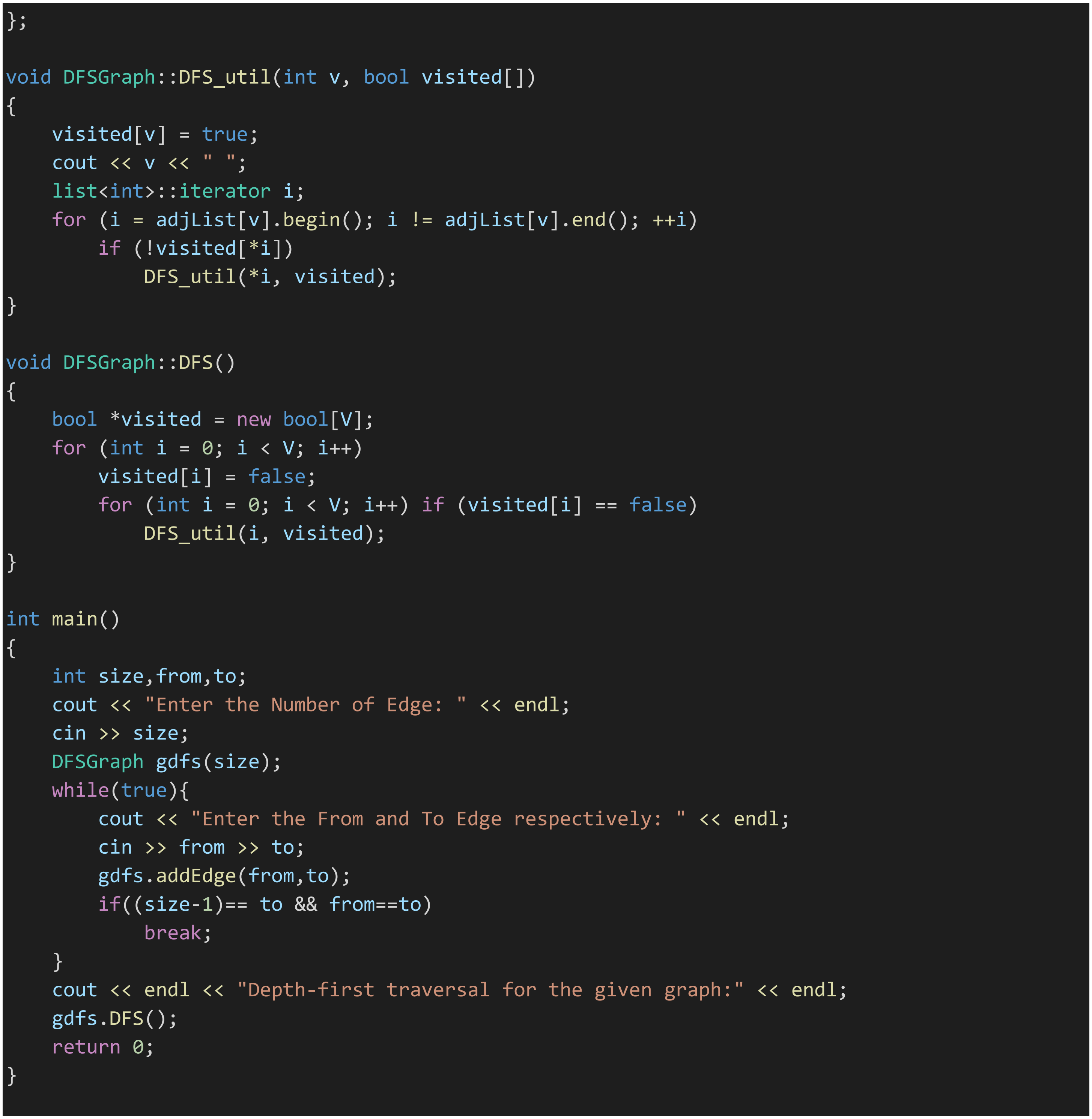
4. Steps for experiment/practical/Code:

```cpp
#include <iostream>
#include <list>
using namespace std;

class DFSGraph
{
    int V;
    list<int> *adjList;
    void DFS_util(int v, bool visited[]);

public:
    DFSGraph(int V)
    {
        this->V = V;
        adjList = new list<int>[V];
    }

    void addEdge(int v, int w)
    {
        adjList[v].push_back(w);
    }
    void DFS();
```



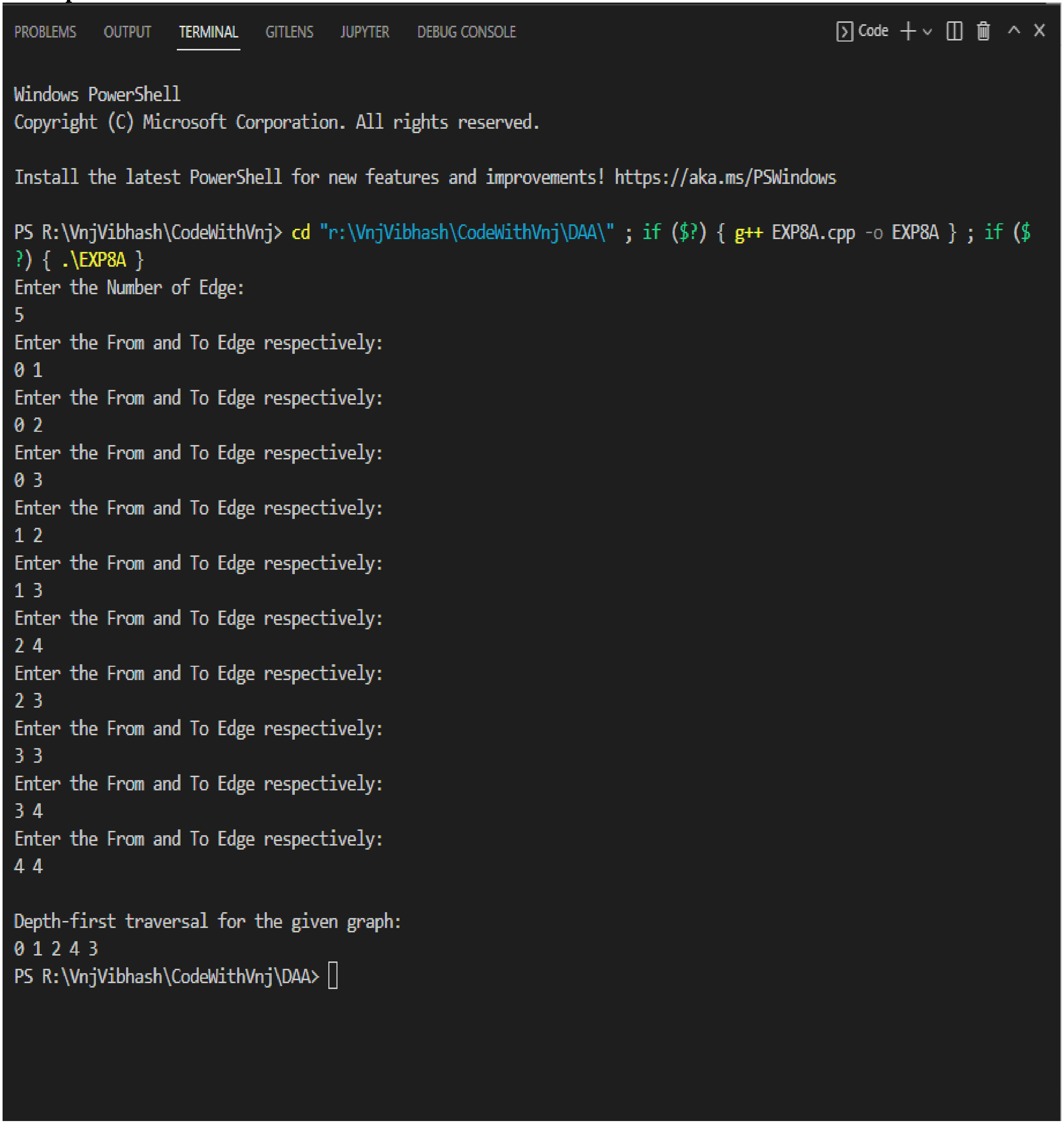
```
};

void DFSGraph::DFS_util(int v, bool visited[])
{
    visited[v] = true;
    cout << v << " ";
    list<int>::iterator i;
    for (i = adjList[v].begin(); i != adjList[v].end(); ++i)
        if (!visited[*i])
            DFS_util(*i, visited);
}

void DFSGraph::DFS()
{
    bool *visited = new bool[V];
    for (int i = 0; i < V; i++)
        visited[i] = false;
        for (int i = 0; i < V; i++) if (visited[i] == false)
            DFS_util(i, visited);
}

int main()
{
    int size,from,to;
    cout << "Enter the Number of Edge: " << endl;
    cin >> size;
    DFSGraph gdfs(size);
    while(true){
        cout << "Enter the From and To Edge respectively: " << endl;
        cin >> from >> to;
        gdfs.addEdge(from,to);
        if((size-1)== to && from==to)
            break;
    }
    cout << endl << "Depth-first traversal for the given graph:" << endl;
    gdfs.DFS();
    return 0;
}
```

5. Output:



```
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS R:\VnjVibhash\CodeWithVnj> cd "r:\VnjVibhash\CodeWithVnj\DAA\" ; if ($?) { g++ EXP8A.cpp -o EXP8A } ; if ($
?) { .\EXP8A }
Enter the Number of Edge:
5
Enter the From and To Edge respectively:
0 1
Enter the From and To Edge respectively:
0 2
Enter the From and To Edge respectively:
0 3
Enter the From and To Edge respectively:
1 2
Enter the From and To Edge respectively:
1 3
Enter the From and To Edge respectively:
2 4
Enter the From and To Edge respectively:
2 3
Enter the From and To Edge respectively:
3 3
Enter the From and To Edge respectively:
3 4
Enter the From and To Edge respectively:
4 4

Depth-first traversal for the given graph:
0 1 2 4 3
PS R:\VnjVibhash\CodeWithVnj\DAA> 
```

Learning outcomes (What I have learnt):

1. How to solve the DFS using dynamic programming.

Evaluation Grid (To be created per the faculty's SOP and Assessment guidelines):

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.	Worksheet completion including writing learning objectives/Outcomes. (To be submitted at the end of the day).		
2.	Post-Lab Quiz Result.		
3.	Student Engagement in Simulation/Demonstration/Performance and Controls/Pre-Lab Questions.		
	Signature of Faculty (with Date):	Total Marks Obtained:	