Depth First Search

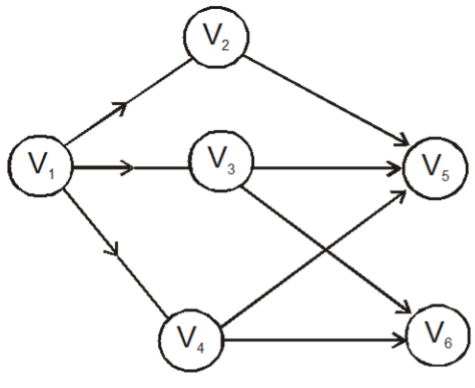
Deva Shriyansh A

19070122049

```cpp
#include <iostream>
#include <conio.h>
#include <stdlib.h>
using namespace std;

// Initializing variables
int counter, i, j, numVertices, stk[10], top, v, visited[15], visit[15];
int cost[10][10];

int main()
{
    int numEdges;

    // User Inputs
    cout << "Enter the number no of vertices: ";
    cin >> numVertices;
    cout << "Enter the no of edges: ";
    cin >> numEdges;
    cout << "\nEDGES \n";
    for (counter = 1; counter <= numEdges; counter++)
    {
        cin >> i >> j;
        cost[i][j] = 1;
    }

    // Initial Vertex to traverse from
    cout << "Enter initial vertex to traverse from: ";
    cin >> v;

    // DFS Logic
    cout << "DFS ORDER OF VISITED VERTICES: ";
    cout << v << " ";

    visited[v] = 1;
    counter = 1;

    while (counter < numVertices)
    {
        for (j = numVertices; j >= 1; j--)
            if (cost[v][j] != 0 && visited[j] != 1 && visit[j] != 1)
            {
                visit[j] = 1;
                stk[top] = j;
                top++;
            }

        v = stk[--top];

        cout << v << " ";
        counter++;
        visit[v] = 0;
        visited[v] = 1;
    }
    return 0;
}
```

Output

Reference Image:



- If the starting vertex is V_1, The
- DFS of this graph is $V_1\ V_2\ V_5\ V_3\ V_6\ V_4$
- and the BFS is $V_1\ V_2\ V_3\ V_4\ V_5\ V_6$

Running the code:

```
Enter the number no of vertices: 6
Enter the no of edges: 8

EDGES
1 2
1 3
1 4
2 5
3 5
3 6
4 5
4 6
Enter initial vertex to traverse from: 1
DFS ORDER OF VISITED VERTICES: 1 2 5 3 6 4
```