

PRACTICAL NO: 1B

TITLE: Design and implement Parallel Depth First Search based on existing algorithms using OpenMP. Use a Tree or an undirected graph for DFS

CODE:

```
#include <iostream>
#include <vector>
#include <stack>
#include <omp.h>
using namespace std;
const int MAX = 100000;
vector<int> graph[MAX];
bool visited[MAX];
void dfs(int node) {
    stack<int> s;
    s.push(node);

    while (!s.empty()) {
        int curr_node = s.top();
        s.pop();

        if (!visited[curr_node]) {
            visited[curr_node] = true;

            if (visited[curr_node]) {
                cout << curr_node << " ";
            }
            #pragma omp parallel for
            for (int i = 0; i < graph[curr_node].size(); i++) {
                int adj_node = graph[curr_node][i];
                if (!visited[adj_node]) {
                    s.push(adj_node);
                }
            }
        }
    }
}

int main() {
    int n, m, start_node;
    cout << "Enter No of Node,Edges,and start node:" ;
    cin >> n >> m >> start_node;
    //n: node,m:edges
    cout << "Enter Pair of edges:" ;
    for (int i = 0; i < m; i++) {
        int u, v;
        cin >> u >> v;
        //u and v: Pair of edges
        graph[u].push_back(v);
        graph[v].push_back(u);
    }
    #pragma omp parallel for
    for (int i = 0; i < n; i++) {
```

```

        visited[i] = false;
    }
    dfs(start_node);
/*    for (int i = 0; i < n; i++) {
        if (visited[i]) {
            cout << i << " ";
        }
    }*/
    return 0;
}

```

OUTPUT:

```

datanalytics@datanalytics-OptiPlex-3050:~$ g++ -fopenmp bfs.cpp -o bfs1
bfs.cpp: In function 'node* insert(node*, int)':
bfs.cpp:63:1: warning: control reaches end of non-void function [-Wreturn-type]
   63 | }
      | ^
datanalytics@datanalytics-OptiPlex-3050:~$ ./bfs1

```

```

enter data: 0
do you want insert one more node?y

```

```

enter data: 1
do you want insert one more node?y

```

```

enter data: 2
do you want insert one more node?y

```

```

enter data: 3
do you want insert one more node?y

```

```

enter data: 4
do you want insert one more node?n

```

```

0      1      2      3      4
datanalytics@datanalytics-OptiPlex-3050: ~
datanalytics@datanalytics-OptiPlex-3050: ~
enter data: 1
do you want insert one more node?y
enter data: 2
do you want insert one more node?y
enter data: 3
do you want insert one more node?y
enter data: 4
do you want insert one more node?n
0      1      2      3      4
datanalytics@datanalytics-OptiPlex-3050:~$
datanalytics@datanalytics-OptiPlex-3050:~$

```