BFS:

```
#include<iostream>

#include<stdlib.h>

#include<queue>

using namespace std;



class node

{

   public:


    node *left, *right;

    int data;


};


class Breadthfs

{


 public:


 node *insert(node *, int);

 void bfs(node *);


};
```

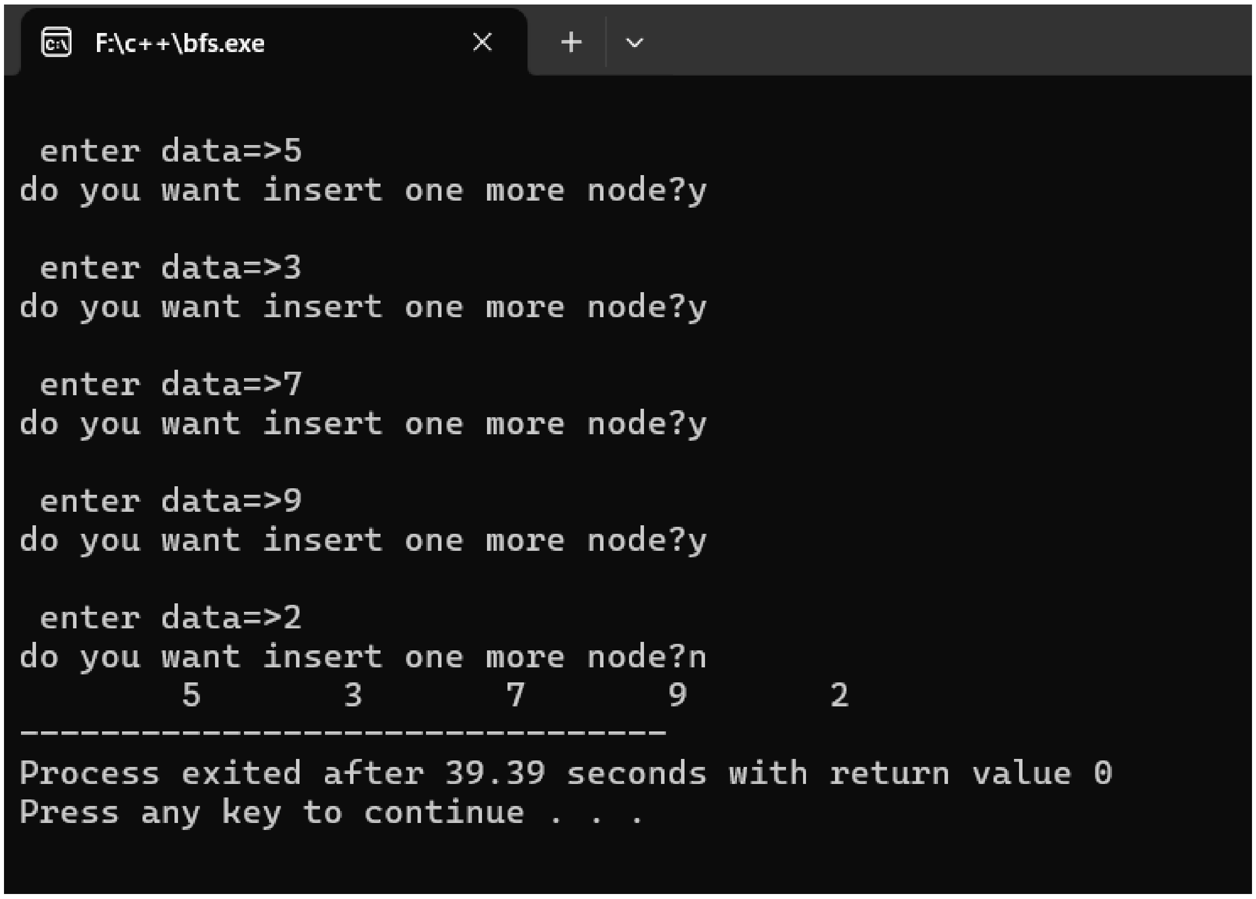
```
node *insert(node *root, int data)
// inserts a node in tree
{

    if(!root)
    {

            root=new node;
            root->left=NULL;
            root->right=NULL;
            root->data=data;
            return root;
    }

    queue<node *> q;
    q.push(root);

    while(!q.empty())
    {

            node *temp=q.front();
            q.pop();

            if(temp->left==NULL)
            {

                    temp->left=new node;
```

```
        temp->left->left=NULL;
        temp->left->right=NULL;
        temp->left->data=data;
        return root;
}
else
{

q.push(temp->left);

}

if(temp->right==NULL)
{

        temp->right=new node;
        temp->right->left=NULL;
        temp->right->right=NULL;
        temp->right->data=data;
        return root;
}
else
{

q.push(temp->right);

}
```

```
    }

}



void bfs(node *head)
{


              queue<node*> q;
              q.push(head);


              int qSize;


              while (!q.empty())
              {
                           qSize = q.size();
                           #pragma omp parallel for
             //creates parallel threads
                           for (int i = 0; i < qSize; i++)
                           {
                                        node* currNode;
                                        #pragma omp critical
                                        {
                                          currNode = q.front();
                                          q.pop();
                                          cout<<"\t"<<currNode->data;
```

```
                    }// prints parent node
                    #pragma omp critical
                    {
                    if(currNode->left)// push parent's left node in queue
                        q.push(currNode->left);
                    if(currNode->right)
                        q.push(currNode->right);
                    }// push parent's right node in queue

                }
            }

}

int main(){

    node *root=NULL;
    int data;
    char ans;

    do
    {
        cout<<"\n enter data=>";
        cin>>data;

        root=insert(root,data);
```

```
            cout<<"do you want insert one more node?";

            cin>>ans;


    }while(ans=='y'||ans=='Y');


    bfs(root);


    return 0;

}
```



F:\c++\bfs.exe

```
 enter data=>5
do you want insert one more node?y

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

 enter data=>7
do you want insert one more node?y

 enter data=>9
do you want insert one more node?y

 enter data=>2
do you want insert one more node?n
        5       3       7       9       2
--------------------------------
Process exited after 39.39 seconds with return value 0
Press any key to continue . . .
```

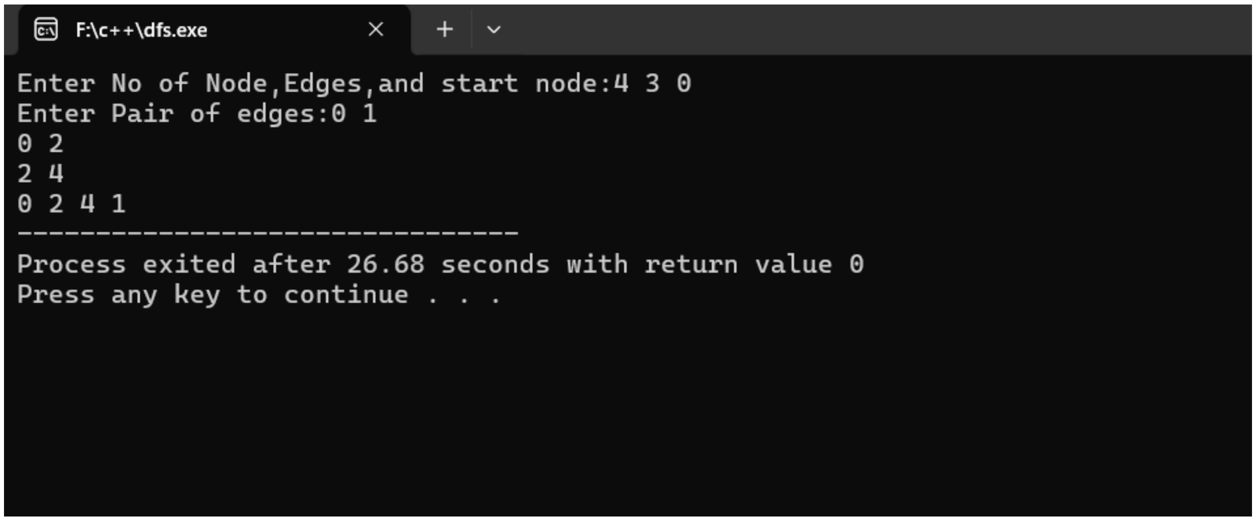
DFS:

```
#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);
          return 0;
```

}


F:\c++\dfs.exe

```
Enter No of Node,Edges,and start node:4 3 0
Enter Pair of edges:0 1
0 2
2 4
0 2 4 1
--------------------------------
Process exited after 26.68 seconds with return value 0
Press any key to continue . . .
```