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REGISTRATION NUMBER –20BCE7315

QUESTION- Write a program to implement Breadth First Search algorithm to explore a graph.

Code-

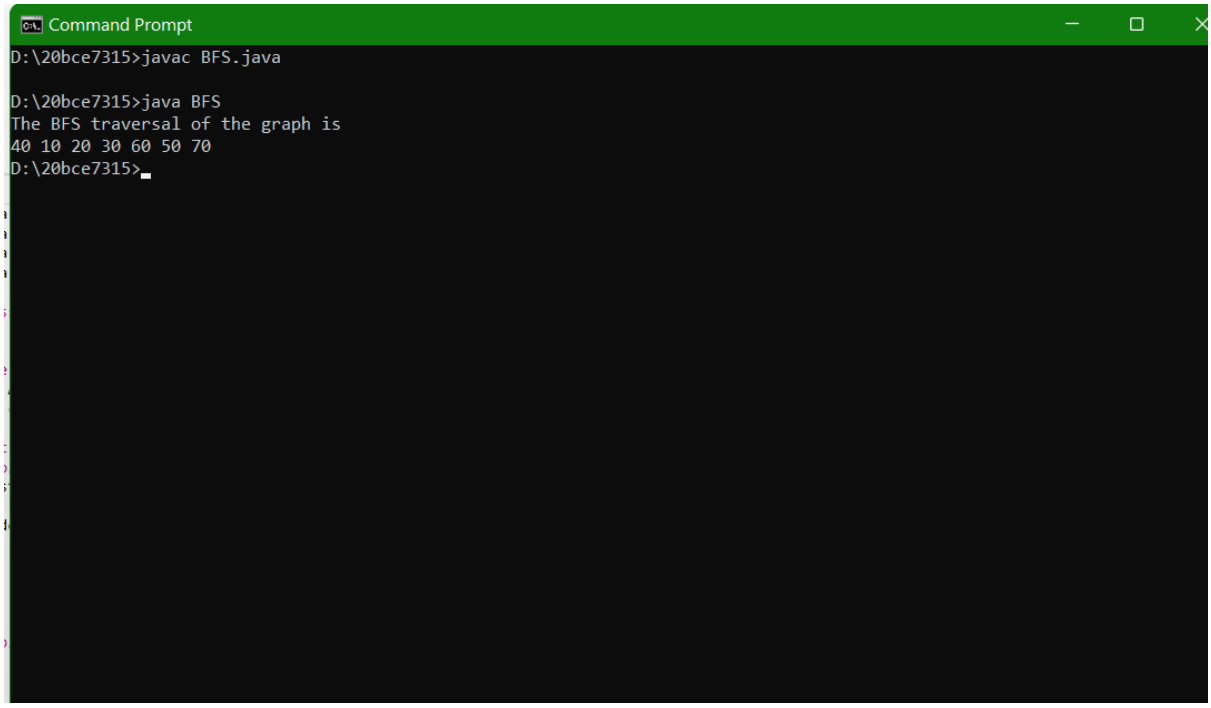
```
import java.util.ArrayList;

import java.util.LinkedList;

import java.util.List;

import java.util.Queue;


public class BFS

{


   private Queue<Node> queue;

   static ArrayList<Node> nodes=new ArrayList<Node>();

   static class Node

   {

      int data;

      boolean visited;

      List<Node> neighbours;


      Node(int data)

      {

         this.data=data;

         this.neighbours=new ArrayList<>();


      }

      public void addneighbours(Node neighbourNode)

      {

         this.neighbours.add(neighbourNode);

      }
```

```
    public List<Node> getNeighbours() {
        return neighbours;
    }
    public void setNeighbours(List<Node> neighbours) {
        this.neighbours = neighbours;
    }
}

public BFS()
{
    queue = new LinkedList<Node>();
}

public void bfs(Node node)
{
    queue.add(node);
    node.visited=true;
    while (!queue.isEmpty())
    {

        Node element=queue.remove();
        System.out.print(element.data + " ");
        List<Node> neighbours=element.getNeighbours();
        for (int i = 0; i < neighbours.size(); i++) {
            Node n=neighbours.get(i);
            if(n!=null && !n.visited)
            {
                queue.add(n);
                n.visited=true;

            }
```

```
        }

    }
}

 public static void main(String arg[])
 {

    Node node40 =new Node(40);
    Node node10 =new Node(10);
    Node node20 =new Node(20);
    Node node30 =new Node(30);
    Node node60 =new Node(60);
    Node node50 =new Node(50);
    Node node70 =new Node(70);

    node40.addneighbours(node10);
    node40.addneighbours(node20);
    node10.addneighbours(node30);
    node20.addneighbours(node10);
    node20.addneighbours(node30);
    node20.addneighbours(node60);
    node20.addneighbours(node50);
    node30.addneighbours(node60);
    node60.addneighbours(node70);
    node50.addneighbours(node70);
    System.out.println("The BFS traversal of the graph is ");
BFS bfsExample = new BFS();
    bfsExample.bfs(node40);

 }
```

}

Output-


Command Prompt
D:\20bce7315>javac BFS.java
D:\20bce7315>java BFS
The BFS traversal of the graph is
40 10 20 30 60 50 70
D:\20bce7315>