

## Question File Locations

### Question 3 – Traverse This Town

- a. Graph.java
- b. Test.java
- c. Test.java
- d. GraphSearch.java
- e. GraphSearch.java
- f. GraphSearch.java
- g. GraphSearch.java
- h. Test.java

### Question 4 – Thank U, Vertex

- b. DirectedGraph.java
- c. Test.java
- d. TopSort.java
- e. TopSort.java

### Question 5 – Uno, Do', Cuatro, I Node You Want Me

- b. WeightedGraph.java
- c. Test.java
- d. Test.java
- e. Test.java

### Question 6 – When You Wish Upon A\*

- a. GridGraph.java
- b. Test.java
- d. Test.java

The screenshot shows the Eclipse IDE interface with the following components:

- Project Explorer:** Displays a workspace with 'Homework 3', 'Project 1', and 'Project 2'.
- Editor:** Shows the file 'Test.java' with the following code:

```
52         System.out.print(neighbor.value + " ")
53         System.out.println("]");
54     }
55     //////////////////////////////////////////////////
56
57     //Create new Linked List Graph Test////////////////////////////////
58     System.out.println("\nLinked List Graph Test")
59     Graph linkedList = part1.createLinkedList(10);
60     for(Node n : linkedList.vertices)
61     {
62         System.out.print(n.value + ": [ ");
63         for(Node neighbor : n.neighbors)
64             System.out.print(neighbor.value + " ")
65         System.out.println("]");
66     }
67     //////////////////////////////////////////////////
68
69     //Get all nodes in HashSet Test////////////////////////////////
70     System.out.println("\nAll Nodes in HashSet Test")
71     HashSet<Node> allNodes = linkedList.getAllNodes();
72     for(Node n : allNodes)
73         System.out.print(n.value + " ");
74     System.out.println();
75     //////////////////////////////////////////////////
76
77     //DFS Recursive Test////////////////////////////////
78     System.out.println("\nDFS Recursive Test");
79     ArrayList<Node> dfsSearchRec = part1.gs.DFSRec(s, x);
80     System.out.print("Start: S, End: D - ");
81     if(dfsSearchRec == null)
82         System.out.println("There is no DFS path between S and D")
83     else
84         for(Node n : dfsSearchRec)
85             System.out.print(n.val + " ");
86     //Reset graph
87     part1.resetGraph(test1);
88     System.out.println();
89
90     dfsSearchRec = part1.gs.DFSRec(s, x);
91     System.out.print("Start: S, End: X - ");
92     if(dfsSearchRec == null)
93         System.out.println("There is no DFS path between S and X")
94     else
95         for(Node n : dfsSearchRec)
96             System.out.print(n.val + " ");
```
- Console:** Displays the output of the program:

```
<terminated> Test (2) [Java Application] C:\Program Files\Java\jdk1.8.0_111\bin\javaw.exe (Mar 30, 2020, 6:24:13 PM)
Unweighted Random Graph Test
85: [ 71 14 1 ]
1: [ 85 25 ]
59: [ 37 14 ]
48: [ 14 87 ]
25: [ 1 71 ]
97: [ ]
87: [ 37 48 ]
71: [ 85 25 ]
14: [ 85 59 48 ]
37: [ 59 87 ]

Linked List Graph Test
1: [ 2 ]
2: [ 1 3 ]
3: [ 2 4 ]
4: [ 3 5 ]
5: [ 4 6 ]
6: [ 5 7 ]
7: [ 6 8 ]
8: [ 7 9 ]
9: [ 8 10 ]
10: [ 9 ]

All Nodes in HashSet Test
2 5 6 4 9 8 1 3 10 7

DFS Recursive Test
Start: S, End: D - S A B C F G H D
Start: S, End: X - There is no DFS path between S and X

DFS Iterative Test
Start: S, End: D - S A C G F H D
Start: S, End: X - There is no DFS path between S and X

BFS Recursive Test
S A B C E F G D H X

BFS Iterative Test
S A B C E F G D H X

BFS Recursive Linked List Test
1 2 3 4 5 6 7 8 9 10
```

The Windows taskbar at the bottom shows the time as 6:25 PM on 3/30/2020.

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84         for(Node n : dfsSearchRec)
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2: [ 1 3 ]
3: [ 2 4 ]
4: [ 3 5 ]
5: [ 4 6 ]
6: [ 5 7 ]
7: [ 6 8 ]
8: [ 7 9 ]
9: [ 8 10 ]
10: [ 9 ]

All Nodes in HashSet Test
2 5 6 4 9 8 1 3 10 7

DFS Recursive Test
Start: S, End: D - S A B C F G H D
Start: S, End: X - There is no DFS path between S and X

DFS Iterative Test
Start: S, End: D - S A C G F H D
Start: S, End: X - There is no DFS path between S and X

BFS Recursive Test
S A B C E F G D H X

BFS Iterative Test
S A B C E F G D H X

BFS Recursive Linked List Test
1 2 3 4 5 6 7 8 9 10

BFS Iterative Linked List Test
1
2
3
4
5
6
7
8
9
10
```