CSC 249 Data Structures and Algorithms
Project – 2

IMPORTANT:

- Your instructor and/or lab assistants have been available to assist with all hands-on activities. Students are expected to complete this project without assistance from others (this includes receiving assistance from individuals inside or outside of CPCC).
- You must include your name, date, and the purpose of the program in the beginning of your code.
- Must include short comments throughout your code (each section) to describe variables, constants, classes, etc.

Instructions

Use the provided source code (see the attachments in Brightspace) as a starting point to implement the BFS and DFS algorithms for traversing a graph.

Node.java

This source code should not require any changes. It is a Node class that represents a simple node in a graph. It has a name field (String data type) and an adjacency list (ArrayList of Node objects) that contains a list of all Nodes that are adjacent to it.

You should browse through the comments to get an understanding of what methods this class offers, and how they are used by the Graph class.

Graph.java

This class will be a driver class that represents a graph.

It contains code that reads a list of nodes and their adjacent nodes from a GraphInfo.txt file, and creates an ArrayList of Nodes that are in the graph.

You should NOT need to change any existing code. You will just need to add some extra code to accomplish your tasks.

The provided code contains plenty of comments and hints to help you with your task. You are free to refer to java documentation for help, but don't resort to Chegg or stack overflow to have someone else implement the algorithms for you!

WHAT YOU NEED TO DO:

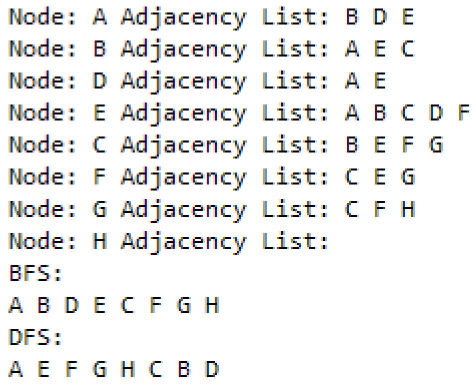
You must implement the breadthFirstSearch and depthFirstSearch methods contained in this class.

Both of these methods have already been defined, they are just lacking the code in their bodies that will actually perform the steps defined in the algorithms. Do not modify (add/remove/change data types) the parameters or return type of these method declarations. Just add your code inside the body of the methods.

breadthFirstSearch() - implement the BFS traversal algorithm described in 13.5.5 of zyBook

depthFirstSearch() - implement the DFS traversal algorithm described in 13.5.6 of zyBook

Sample Output (based on provided GraphInfo.txt file)



```
Node: A Adjacency List: B D E
Node: B Adjacency List: A E C
Node: D Adjacency List: A E
Node: E Adjacency List: A B C D F
Node: C Adjacency List: B E F G
Node: F Adjacency List: C E G
Node: G Adjacency List: C F H
Node: H Adjacency List:
BFS:
A B D E C F G H
DFS:
A E F G H C B D
```

What to Submit

Submit your Graph and Node source code (the .java files - NOT the .class files).