

Lab 3

Undirected Graph Implementation

In class we implemented a `WeightedGraph` together. In this lab, you will take what you learned in that exercise and implement an undirected graph.

1. Create a new Java Project in Eclipse called lab3.
2. You have been given the `GraphInterface.java` and `UndirectedGraph.java`. Most of the implementation has been given to you. Your job is to implement the remaining methods – `addVertex`, `addEdge`, `isMarked`, `clearMarks`, `markVertex`, and `getUnmarked`.

3. You have been given a tester class that includes the `isPathBFS` method. In the main method you should add vertices and edges to your graph based on the following friend list:

Bob is friends with Jack, Cynthia, and Alex

Cynthia is friends with Bob and Alex

Alex is friends with Cynthia, Cathy and Bob

Kevin is friends with Colleen and George

4. Using your graph implementation and the `isPathBFS` method answer the following questions:
 - a. Who are Bob's friends?
 - b. Who are Alex's friends?
 - c. Who are George's friends?

Friends can be either direct or indirect. Bob and Jack are direct friends. Bob and Cathy are indirect friends since Bob is friends with Alex who is friends with Cathy.

- d. Are Jack and Cathy indirect friends?
- e. Are Jack and George indirect friends?

Your output should look like the following:

```
Bob's friends are [Jack, Cynthia, Alex]
Alex's friends are [Bob, Cynthia, Cathy]
George's friends are [Kevin]
Are Jack and Cathy indirect friends?: true
Are Jack and George indirect friends?: false
```

Grading

90 points - Implementation

10 points each for addEdge, addVertex, clearMarks, markVertex, isMarked, getUnmarked

30 points for the tester. This includes printing the output exactly as shown above.

10 points

Your name: Add your name to the top of the .java file after the Javadoc annotation @author

Package: Do not put your code in a package. This makes it difficult for the TAs to grade your submission.

Readability: Make sure your code is indented and neatly commented. You can use `cntl a`, `cntl i` to have Eclipse automatically indent your code properly. Do not leave commented out code in your submission.

Compilation: If your code does not compile, you will receive a 0 on the lab. Once notified, you will have 3 days to fix the lab to receive partial credit, up to 75%.