COMP202 SPRING 2016

Programming Project 5

Graph Implementation

Submission Location: F Drive

Due Date: Sunday 15 May 2016 23:59

Second phase: Will be a 2-person group project. If your group mate is from the other school, you will get 20% bonus.
Your project submissions will be checked for plagiarism.

Second phase

Assignment:

For the second part of the project, you should change graph API in the first phase to support the **directed graph**. Besides, you should also implement following methods in Graph API.

********** **Graph API** **********

// remove a single edge that is part of a directed cycle, and return the edge that is removed
Edge removeEdgeInCycle()

// remove one edge per cycle until there are no more cycles, and return the list of edges in the order in which they are removed
List<Edge> removeAllCycles()

// topological sort of vertices if there are no cycles, otherwise return null
List<Integer> topologicalSort()

// check to see whether the given list of vertices are a topological sort
boolean isTopological(List<Integer> sort)

// generalized form of the verticesWithinDistance2, return vertices within distance d from vertex v
List<Integer> verticesWithinDistance(int v, int d)

Hints:

- You should detect cycle according to DFS algorithm, perhaps you need to modify DFS. Find details on page 601 of the textbook.

- For topological sort, you should use DFS reverse postorder. You can find good guideline in "Algorithms, 4th Edition by Robert Sedgewick and Kevin Wayne", page 578 or the book website http://algs4.cs.princeton.edu/42digraph/
- In graph traversing when there multiple options first visit the smallest vertex number.

Testing:

We will provide some JUnit test case files for testing the project.

Submission:

1. Does the program compile? (Programs that don't compile will not be graded)
2. Does the program meet all required interfaces?
3. Are comments well organized and concise?
4. If you have reviewed your code and all the criteria on the checklist are acceptable, follow the submission procedure.
   Please **do not zip your files**.
   Upload it through Novell Login to the
   F drive/COURSES/UGRADS/COMP202/PROJECT/YOUR_NAME
   Please consider the following format for your projects submission:
   Project5 "This should be the only name for your folder"

Good Luck