The Chinese University of Hong Kong (ShenZhen)

CSC3100 : Data Structure and Algorithms

Fall 2018

Programming Assignment 4

Due date and time: December 16, 2018, 23:59

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1. Problem to solve

You need to design a java program to find the second shortest ***loopless*** path in a directed graph from a start vertex to an end vertex. The maximum number of vertices is 100. The weight of each edge will only be positive. The maximum number of edges is 5000. You should start the programming using the given template As4_123456(change it with your student id).java. All other classes should be defined and implemented in As4_123456.java. Some sample classes are provided in this template (remove them if they are not needed in your implementation). **Please do not change the definition of "secondShortestPath".** The abstract class As4.java is mainly used for the marking purpose. **You don't need to submit As4.java**. Your program can only be implemented in the sequential manner and the multithreading is NOT allowed in the implementation. Remember to test your program before submission.

You also need to write a report to explain the following:

a) What is your algorithm to solve this problem?

b) What is the running time complexity of your algorithm?

c) Are there any other solutions? Why is your solution better than others? (Some test results can be included)

2. Submission

You should only submit two files. One is As4_123456(your student id).java and the other a report named "AS4Report_123456(your student id).pdf" (PDF format).

3. Grading

If your program does not compile correctly or does not follow the instructions of implementation, or does not follow the instructions of submission, you receive 0 marks.

Your solution will be graded on

a) Correctness (30 percent)

If your program does not work correctly, you receive 0 mark

b) Performance (40 percent)

The performance (running time) of all submissions will be ranked and the top one gets the full marks and the bottom one gets the minimum marks (will be decided later).

c) Documentation (30 percent)