UNIVERSITEIT VAN PRETORIA
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Department of Computer Science

COS212: Practical 9

Release: Thursday 4 May 2017, 18:00
Deadline: Friday 5 May 2017, 18:00

Instructions

Complete the tasks below. Certain classes have been provided for you in the *files* folder of the practical download. You have been given a main file which will test some code functionality, but it is by no means intended to provide extensive test coverage. You are encouraged to edit this file and test your code more thoroughly. Remember to test "corner" cases. Upload **only** the given source files with your changes in a zip archive before the deadline. Please comment your name **and** student number in at the top of each file.

Task 1: Topological Sort [25]

Topological ordering or sorting of a directed graph is a linear ordering of its vertices such that for every directed edge uv from vertex u to vertex v, u comes before v in the ordering. For instance, the vertices of the graph may represent tasks to be performed, and the edges may represent constraints that one task must be performed before another; in this application, a topological ordering is just a valid sequence for the tasks. A topological ordering is possible if and only if the graph has no directed cycles, that is, if it is a directed acyclic graph (DAG). Any DAG has at least one topological ordering, and algorithms are known for constructing a topological ordering of any DAG in linear time.

You have been provided with a Graph implementation in the file `Graph.java` and `main.java` for your work. Your task is to implement the following function:

`public void PossibleTopologicalSorts()`: Implement a topological sort and print out all possible sorts of the given Graph. Your function must output it results as depicted in `expected output`

`Note:` Refer to `Chapter 8.7` of the text book for details. `main.java` file will be over written by Fitch Fork, therefore, implement your expected output within the functions except the title(All Topological sorts).

Submission

Submit your source files on the CS Website. Place all the files in a zip archive named as uXXXXXXXX.zip where XXXXXXXX is your student number. Please make use of the submission slot that corresponds to your practical session (Practical 4 Tuesday). Submit your work before the deadline. No late submissions will be accepted.