



Course Assignments
for

Graph Drawing
4DV302 – Fall 10

3rd assignment

Deadline for this assignment is Nov 8, 2010.

Task 1 *X-Coordinate Assignment (all groups except Group D)*

Extend your self-implemented graph drawing tool from Assignment 2 by a postprocessing step to avoid the so-called spaghetti code. A good reference that can help you to find an algorithm (non-LP) is Section 4.1 from the paper: E.R. Gansner, E. Koutsofios, S.C. North, K.-P. Vo: A technique for drawing directed graphs, IEEE Transactions on Software Engineering 19 (3), 1993, 214–230, (<http://cs.lnu.se/isovis/courses/fall10/4dv302/assignments/Gansner93.pdf>). Another reference that explains a suitable algorithm in a very abstract way would be the teaching material of P. Mutzel (in German): <http://cs.lnu.se/isovis/courses/fall10/4dv302/assignments/schichten.pdf>

Task 2 *Graph Viewer (all groups)*

Implement a Java-based graph viewing tool that is able to read an input GraphML file with a graph specification and to draw the input graph with the help of a toolkit (you will find their URLs on the course web page). A GUI is needed to allow the user to load input files easily and to select various layout algorithms. You should use the following graph specifications for testing:

<http://cs.lnu.se/isovis/courses/fall10/4dv302/assignments/rome-GraphML.zip> (undirected)
<http://cs.lnu.se/isovis/courses/fall10/4dv302//assignments/digraphs-GraphML.zip> (directed)

- Group A
 - Toolkit: JUNG Java Universal Network/Graph Framework
 - Type of graphs: undirected
 - Data set: see above
 - Layout algorithms: all that JUNG offers for that type of graphs
- Group B
 - Toolkit: PREFUSE Visualization Toolkit
 - Type of graphs: undirected
 - Data set: see above
 - Layout algorithms: all that PREFUSE offers for that type of graphs
- Group C
 - Toolkit: PREFUSE Visualization Toolkit
 - Type of graphs: directed
 - Data set: see above
 - Layout algorithms: all that PREFUSE offers for that type of graphs

- Group D
 - Toolkit: JUNG Java Universal Network/Graph Framework
 - Type of graphs: directed
 - Data set: see above
 - Layout algorithms: all that JUNG offers for that type of graphs

Task 3 *Extra Task (optional)*

Since some students wanted more challenging tasks, we decided to provide you with one additional optional task. Students who successfully finish this task will have the possibility to improve their oral exam grade. You should use (or extend if necessary) your implementation from Assignment 2, or use the presented libraries to visualize the relational data found here:

CSV format: <http://cs.lnu.se/isovis/courses/fall10/4dv302/assignments/cell.csv>

Excel format: <http://cs.lnu.se/isovis/courses/fall10/4dv302/assignments/cell.xls>

The data set includes records with the following fields:

- From: Identifier for the calling cell
- To: Identifier for the receiving cell
- Datetime: a *yyyymmdd hhmm* format date and time
- Duration: duration of the call in seconds
- Cell Tower: Location of the call origination cell tower

Your implementation must visualize more than just nodes and edges. For example edge width can represent *Duration*.

Please prepare a demo of your tools as well as a short presentation (about 5-10 minutes) (PowerPoint, Latex, PDF, ...) on the most important aspects of your implementation like data structures, etc. You will present both during the third exercise at Nov 9th, 2011. Please, use your own notebook for the demo and the presentation! Send all files to Ilir Jusufi via email by the given deadline! Any kind of plagiarism is not accepted and leads to the consequence that all group members will fail the course.