Department of Computer Science

Linnæus University

Course Assignments
for

Graph Drawing
4DV302 – Fall 13

1st assignment

Deadline for this assignment is Sep 15, 2013.

Task 1 *Graph example (no group work)*
Draw the following graph given by the adjacency matrix

$$\begin{pmatrix} 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 0 \end{pmatrix}$$

by using your creativity and hands. Answer the following questions:

1. Is the graph directed or undirected?

2. Does it have cycles? If yes, where?

3. Is this graph simple?

4. What is the maximal degree of a node in the graph? In case the graph is directed, distinguish between indegree and outdegree.

5. What is a transitive edge? Does this graph have transitive edges? If yes, where?

Task 2 *Graph editors and specification languages (no group work)*
Install the graph editor GDE. You can find it available for Windows and Linux here: http://www.oreas.de/gde_en.php . Produce a nice drawing of the graph from Task 1 with the help of GDE. To do that you must convert this adjacency matrix to a GML-file, load it into GDE, and choose a suitable layout algorithm. A URL to the specification language GML is also given on the course web page (http://cs.lnu.se/isovis/courses/fall13/4dv302.html).

Task 3 *Layout of selected graphs (no group work)*
Download the ZIP-file with five different graphs from moodle in *Assignments/Graph files for assignment 1* and draw them with GDE as good and nice as possible! Test all algorithms and available options of this tool to get the best result. Why do you think that your result is nice and the best? Please, justify your thoughts!

Please prepare a short presentation (PowerPoint, Latex, PDF, ...) on/with your results and upload it in moodle by the given deadline! If you have questions you can contact Björn Zimmer via email (bjorn.zimmer@lnu.se). You will have to present your work during the first exercise at September, 18th. Room B3033V. 14:00-15:00.