Home Assignment 1.3

Version 1.1

Use the networks provided in the file `ass13.zip` and do the following task.

Task

Network A (two-mode network):

(a) Develop an Octave function that "folds" a two-mode network (both *top* and *bottom* projections, depending on a parameter) into a one-mode network. Apply this function to your Network A and store the resulting weighted one-mode networks in `networkA_t.csv` and `networkA_b.csv`.

(b) Develop an Octave function that calculates and draws the KNC-plot of a given weighted one-mode network. Apply this function to `networkA_t` and `networkA_b`, and store the resulting plots in `networkA_t_KNC.png` and `networkA_b_KNC.png`.

Detailed interface descriptions are provided in a separate file (see below).

Bonus Task (voluntary, no points!)

- Visualize `networkA_t` and `networkA_b` with *NetworkX* and/or *Pajek*. Apply different thresholds k and illustrate their effect on the connectivity of the network. Include network visualizations (PNG files) with different thresholds k.

- Identify and highlight the most prominent actor in your network B based on degree centrality.

Provided files

`http://www.kmi.tugraz.at/staff/markus/courses/SS2010/707.000_web-science/ass13.zip`

- `actorLabelsA.txt`

- `eventLabelsA.txt`

- `networkA.csv`

- `networkB.csv`

- `script13.m` contains interface descriptions for the required Octave functions. Your Octave functions must comply with these interfaces! the knc function has an additional parameter, the name of the image that it plots.

Structure of your repository

- `report.pdf` (contains your results, plots, and interpretations; keep it VERY short!)

- `octave/`
    - `fold.m`
    - `knc.m`
    - `networkA_t.csv`
    - `networkA_b.csv`

- – `networkA_t_KNC.png`
- – `networkA_b_KNC.png`

- • `bonusTask/`
  - – `*.*` (anything you did for the bonus task: plots, scripts, Octave files, Pajekt `.net` files)

Your file `report.pdf` and every source code file has to have a header containing your name and matriculation number.

Submission

Home Assignment 1.3 is due **May 3, 2010 12:00** (high noon).

The due date is a *soft deadline*. That is, your score on the assignment will be rated 100% if you hand in the assignment before 12:00. The following 12 hours are suitable for a submission as well, *but* your points will be rated 66%. Read: 1/3 of your points will be substracted if you hand in your assignment between 12:00 and 23:59. 24:00 is the *hard deadline*; if you hand in anything after 24:00 you will not receive any points.

Submission is done using the SVN version control system. (See instructions on the course website.)

Policies

- • No external Octave packages are allowed.

- • Your code will be tested with independent datasets in an automated way, assuming your functions comply with the interfaces in the provided files.

- • Your code and report will be checked for plagiarism.

Resources

- • MatLab/Octave:
  - – `http://www.math.umn.edu/~lerman/math5467/matlab_adv.pdf`
  - – `http://www-mdp.eng.cam.ac.uk/web/CD/engapps/octave/octavetut.pdf`
  - – `http://en.wikibooks.org/wiki/Octave_Programming_Tutorial`

- • NetworkX: `http://networkx.lanl.gov`
  - – Installation: `http://networkx.lanl.gov/install.html`
  - – NumPy: `http://sourceforge.net/projects/numpy/files/`
  - – matplotlib: `http://sourceforge.net/projects/matplotlib/files/matplotlib/`

- • Pajek:
  - – `http://vlado.fmf.uni-lj.si/pub/networks/pajek/`
  - – `http://vlado.fmf.uni-lj.si/pub/networks/pajek/howto/text2pajek.htm`
  - – `http://vlado.fmf.uni-lj.si/pub/networks/pajek/howto/excel2Pajek.htm`