

## Home Assignment 1.2

Version 1.0

1. Network A (2 mode network):
  - a. Using Pajek and the provided MatLab function `matlab2pajek`, produce a visual representation of your network and store it in a pajek .net file (`Draw->Export->2D->Bitmap, visual_NetworkA.png`). (`networkA.net`).
  - b. Develop a MatLab function `calcParticipationRates(network)` that calculates the average size of events and the average rate of participation.
2. Network B (1 mode network):
  - a. Using Pajek and the provided MatLab function `matlab2pajek`, produce a visual representation of your network and store it in a pajek .net file (`Draw->Export->2D->Bitmap, visual_NetworkB.png`). (`networkB.net`).
  - b. Develop a MatLab function `isconnected(network)` that determines whether a given network is connected.
  - c. Develop a MatLab function `degree_distribution(network)` that calculates the degree distribution of a given network. Plot the degree distribution of network B using MatLab plotting functionality (`networkB_degrees_before.png`).
  - d. Develop MatLab functions that calculates the number of edges, average L and C of network B: `getNumEdges(network)`, `small_world(network)`.

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

### Provided files:

[http://www.kmi.tugraz.at/staff/markus/courses/SS2009/707.000\\_web-science/provided-files.rar](http://www.kmi.tugraz.at/staff/markus/courses/SS2009/707.000_web-science/provided-files.rar)

- `script.m`: contains interface descriptions for the required MatLab functions
- `Matlab2Pajek.m`: function that converts MatLab matrices into Pajek format
- Testdata:
  - `networkA.csv, networkB.csv`: one- and two-mode test networks
  - `labels.m`: contains actor-, event- and nodelabels of the test networks

### Submission:

Submit the following results via the TUG teach center available at

[http://tugtc.tugraz.at/wbtmaster/courses/project\\_707000\\_room1.htm](http://tugtc.tugraz.at/wbtmaster/courses/project_707000_room1.htm) until week 4 (16.3.2009).

Your submission “`wswt_ass1_2_<YOURMATR.NR>.zip`“ should be structured as followed:

<code>wswt_ass1_2_&lt;YOURMATR.NR&gt;/report.pdf</code>	# contains your results and interpretations
<code>wswt_ass1_2_&lt;YOURMATR.NR&gt;/crawler</code>	#contains the source code
<code>wswt_ass1_2_&lt;YOURMATR.NR&gt;/matlab</code>	
	<code>isconnected.m</code>
	<code>calcParticipationRates.m</code>
	<code>degree_distribution.m</code>
	<code>getNumEdges.m</code>
	<code>small_world.m</code>
	<code>networkA.csv</code>
	<code>networkB.csv</code>
	<code>networkA.net</code>
	<code>networkB.net</code>
	<code>visual_NetworkA.png</code>
	<code>visual_NetworkB.png</code>
	<code>networkB_degrees_before.png</code>

**Policies:**

- No external Matlab packages are allowed.
- Your MatLab code will be tested with independent datasets and checked for plagiarism.

**Resources:**

- MatLab
  - [http://www.math.umn.edu/~lerman/math5467/matlab\\_adv.pdf](http://www.math.umn.edu/~lerman/math5467/matlab_adv.pdf)
- 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>