

**COMP4302/COMP5322 Artificial Neural Networks**  
**Semester 1, 2003**

**Assignment 2. World Population Map**

Out: week 6, due week 8

**Data Source:** population.xls

The data contains world population estimates, projections, and other key indicators for more than 200 countries for 2001.

**Task**

1. Select 10 features characterizing the population of about 100 countries. Export data into csv format and load it into Matlab.
2. Normalise the data between 0 and 1. (`min`, `max` and `minmax` are some useful Matlab commands)
3. Design a two-dimensional SOM. Plot the topology of the network. Number the competitive neurons on the plot (can be done in Matlab or manually on the hard copy).
4. Train SOM to cluster the data
5. Simulate the network and find the competitive neuron activated by each country. Show in a table the countries that activate each competitive neuron. Alternatively, if space allows, you can write the country names directly on the topology graph.
6. Write a brief report including:
  - description of data (features and countries)
  - SOM design and training (number of competitive neurons, type of the neighborhood, training epochs). Include the topology plot.
  - results (the table from 4 above)
  - discussion and interpretation of the results (e.g. global analysis: suggest cluster boundaries based on the results and data characteristics; local analysis: consider 3 competitive neurons and their country labels; what are the similar characteristics of the countries for each neuron, anything else you consider important.)

Enclose your Matlab code.

**Submission:** 1) hard copy (report+code) must be submitted in the locker labeled COMP4302/COMP5322 located in Madsen Building (the left corridor) and 2) electronically (report+code) by e-mail or netfile to your tutor

**Deadline:** Tuesday, 16 September 2003, 5pm (week 8)