Neural networks practicals

Exercise 1

In this practical you will use a neural network to recognise leaves. Go to the web page with the leaf recognition applet (http://damato.light-speed.de/lrecog/applet.html#start).

First you need to select some examples of leaves to train the network with.
Click on the *Image Processing* tab. There are four species of leaves. Select a leaf from the *leaf images* list then *Find Tokens* to get digital information about the shape of the leaf. Do this for several leaves from each species.

Now you need to train the leaf. Click on the *Neuronal Network* tab. Press *Train Network* button.

Now see if the network work. Click on the *Recognition* tab. Press the *Load Image* button, pick a leaf image and press *Open*. Now press the *Recognise* button. Is the leaf species correctly recognised? Try a few more leaf images.

Exercise 2

In this practical you will build a neural network to behave like a comparator. Start the applet from http://www.cs.ubc.ca/labs/lci/CIspace/Version4/neural/ . Create two input nodes named "inverting" and "non-inverting". Now create some hidden nodes, decide how many hidden nodes and how many layers you want. Create two output nodes named "High" and "Low". Click on the *Create Edge* button and connect the inputs to the hidden nodes and the hidden nodes to the output layers. You now have your neural network.

Create the training set by pressing the *View/Edit Examples* button. Use the Add New Example button to add two input numbers. If non-inverting is bigger than inverting make High=1 and Low=0, if inverting is bigger than non-inverting make High=0 and Low=1. Add several training examples. Press the *Close Window* button.

Now train the network and test it. Press the *Solve* tab. Then press the *Randomize Parameters* button to give the weights and thresholds random values to start with. Click the *Show Plot* button and press the *Step To Target Error* button to train the network and get the weights and thresholds to the right values.

Try out the network by clicking on the *Calculate Output* button. Enter some test values and press *Calculate*. Is the answer correct? Try out a few more examples.