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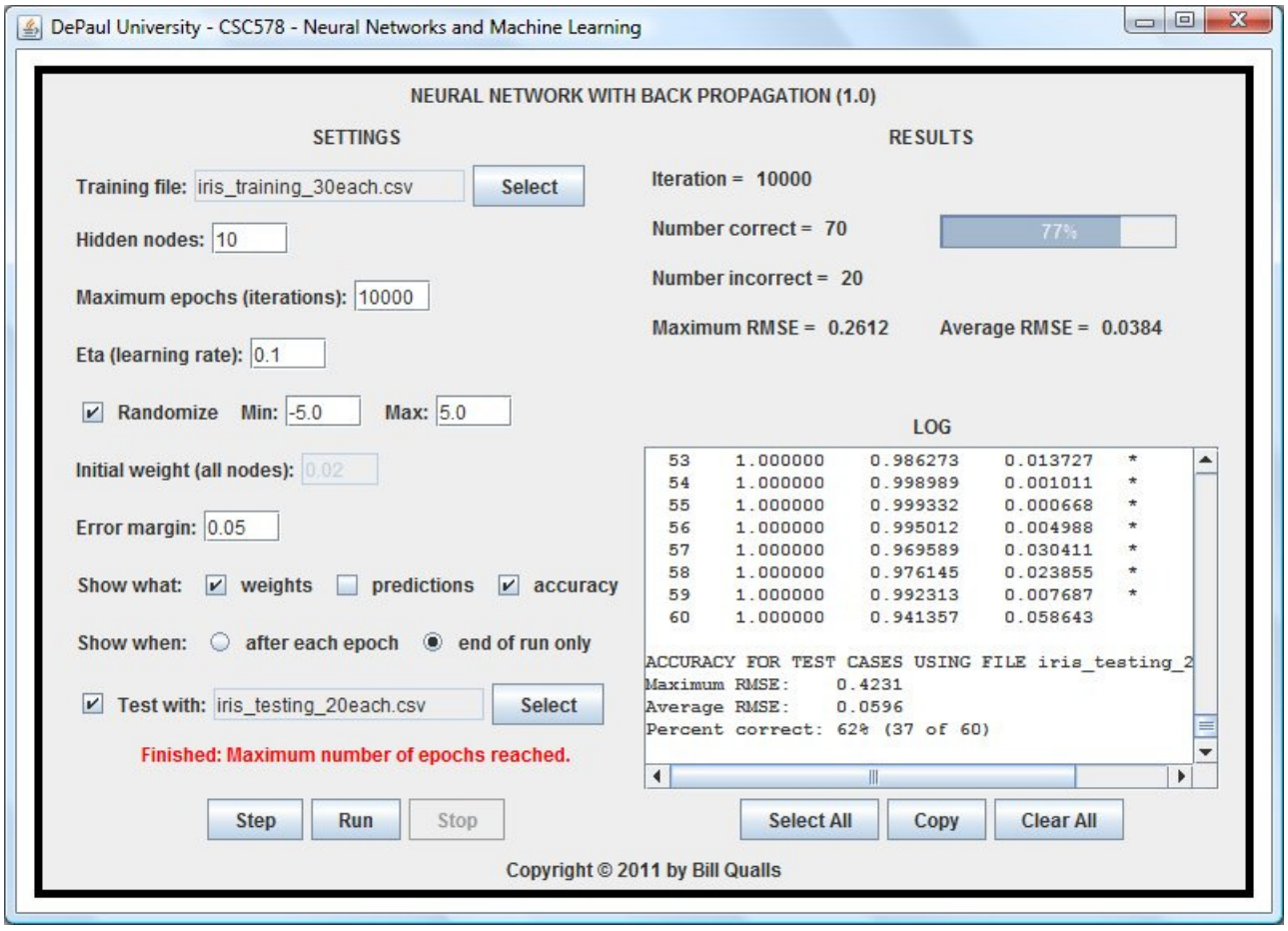
Installation

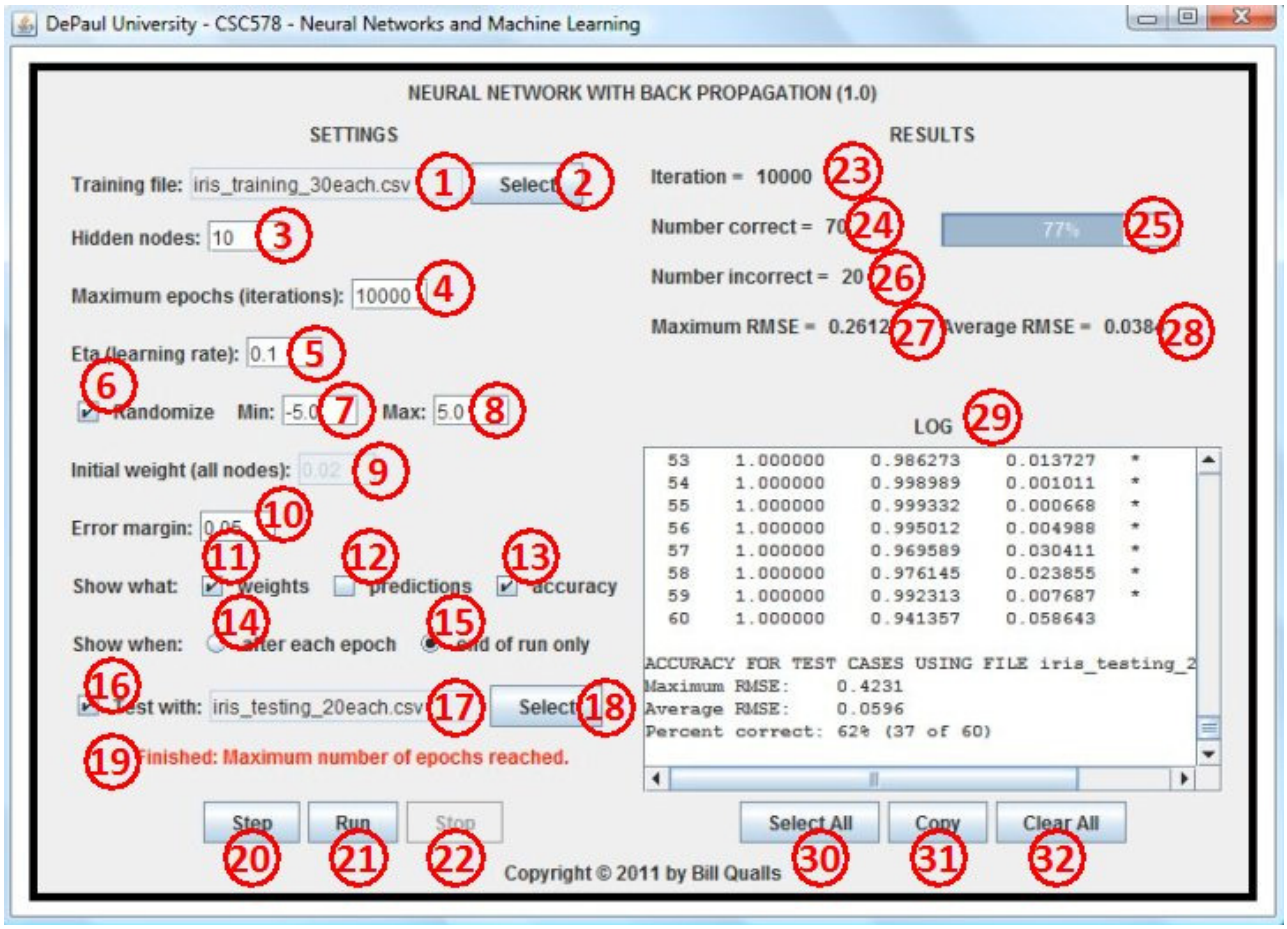
My program was written in Java and developed using Eclipse running under the Vista operating system. The website includes a link to an executable jar file (**qualls_nn.jar**): just double-click to run (unless your site's security settings block executable jar files.

Description of the system

The interface appears as follows:



An annotated interface follows:



Item	Description
1	Name of the chosen training file shows here (see item 2).
2	Click here to choose the training file via a file chooser dialog.
3	Enter number of hidden nodes here.
4	Enter maximum number of epochs (iterations) here.
5	Enter eta (learning rate) here.
6	Select the check box to enable randomized weights.
7	Enter minimum random weight here. Enabled when Randomize checkbox (item 6) is checked.
8	Enter maximum random weight here. Enabled when Randomize checkbox (item 6) is checked.
9	Enter initial weight to be used everywhere here. Enabled when Randomize checkbox (item 6) is not checked.
10	Enter error margin here.
11	Check this box to include a list of weights in the log.
12	Check this box to include a list of predicted values in the log.
13	Check this box to include a list of measures of accuracy in the log.
14	Check this radio button to show the selected items (items 11, 12, or 13) after each epoch.

Item	Description
15	Check this radio button to show the selected outputs (items 11, 12, or 13) at the end of each run only.
16	Check this box to include at the end of the run the results of testing with the indicated test file. Checking this box enables the Select button (item 18).
17	Name of the chosen testing file shows here (see item 18).
18	Click here to choose the testing file via a file chooser dialog. Button is enabled only if the checkbox (item 16) is checked.
19	Error and status messages will appear here.
20	Click the Step button to step through the program; that is, to execute a single iteration.
21	Click the Run button to run the program through to completion; that is, until the maximum epochs is reached or until all input cases are correctly classified (within the specified error margin). You can choose to Run a program which you have been Stepping through; that is, stop Stepping.
22	Click the Stop button to stop Stepping or Running. This button is disabled if you are not Stepping or Running.
23	Iteration (epoch) is shown here. This display item is updated after each iteration.
24	Number of correctly classified training cases is shown here. This display item is updated after each iteration.
25	Progress bar showing the percent of training cases correctly classified. This display item is updated after each iteration.
26	Number of incorrectly classified training cases is shown here. This display item is updated after each iteration.
27	Maximum RMSE is shown here. This display item is updated after each iteration.
28	Average RMSE is shown here. This display item is updated after each iteration.
29	Scroll pane containing a log of inputs and outputs.
30	Click the Select All button to select the entire scroll pane (item 29).
31	Click the Copy button to copy the selected area within the scroll pane (item 29) to the paste buffer. This allows the user to copy the scroll pane to Notepad, Word, etc.
32	Click here to clear the entire scroll pane (item 29). You might choose to do so after each run to make better use of the Select All (item 30) and Clear (item 31) buttons.

Sample Outputs

This is an example of the listing of the input file will always appears in the log:

```
*** Begin list of training file iris_training_30each.csv ***
0.222222,0.625000,0.067797,0.041667,0.00
0.166667,0.416667,0.067797,0.041667,0.00
:
:
0.583333,0.333333,0.779661,0.833333,1.00
0.805556,0.416667,0.813559,0.625000,1.00
*** End list of training file iris_training_30each.csv ***

Training file has 90 rows and 4 input nodes.
```

This is an example of the program settings as echoed to the log with each run:

```
Hidden nodes: 10
Maximum epochs: 10000
Eta (learning rate): 0.1
Minimum initial weight: -5.0
Maximum initial weight: 5.0
Error margin: 0.05
```

This is an example of the output which will appear in the log when the “weights” checkbox (item 11) is checked:

```
WEIGHTS FOR EPOCH 10000:
From Node   To Node     Weight
---------  ---------  ----------
  x( 0)      h( 1)     -4.340172
  x( 0)      h( 2)      6.077938
  :
  :
  h( 9)      o( 1)      6.084969
  h(10)      o( 1)      0.517105
```

This is an example of the output which will appear in the log when the “predictions” checkbox (item 12) is checked:

```
PREDICTIONS FOR EPOCH 10000:
Row    Expected     Actual       Error    OK?
----  ----------  ----------  ----------  ---
   1    0.000000    0.005881    0.005881   *
   2    0.000000    0.017499    0.017499   *
   :
   :
  89    1.000000    0.997944    0.002056   *
  90    1.000000    0.837304    0.162696
```

This is an example of the output which will appear in the log when the "accuracy" checkbox (item 13) is checked:

```
ACCURACY FOR EPOCH 10000:
Maximum RMSE:    0.2596
Average RMSE:    0.0310
Percent correct: 84% (76 of 90)
```

This is an example of the output which will appear in the log when the "Test with" checkbox (item 16) is checked:

```
PREDICTIONS FOR TESTING DATA SET:
Row    Expected     Actual       Error    OK?
----  ----------  ----------  ----------  ---
   1    0.000000    0.012108    0.012108   *
   2    0.000000    0.009412    0.009412   *
   :
   :
  59    1.000000    0.996514    0.003486   *
  60    1.000000    0.894218    0.105782

ACCURACY FOR TEST CASES USING FILE iris_testing_20each.csv:
Maximum RMSE:    0.3720
Average RMSE:    0.0472
Percent correct: 65% (39 of 60)
```