Assignment 9 Python - Neural Nets

Due Apr 23, 2016 by 5pm **Points** 50 **Submitting** an external tool
Available until Apr 26, 2016 at 5pm

This assignment was locked Apr 26, 2016 at 5pm.

- **Starting code** (http://rice.codeskulptor.org/#comp130_exercises_nn_solution.py) — our solution to the neural net class exercises
- **Test** (http://codeskulptor.appspot.com/owltest/?urlTests=comp130.assignment_nn_tests.py&urlPylintConfig=comp130.pylint_config.py)

Implementing neural nets

Complete the neural net implementation. You can use the provided solution for the in-class exercises.

1. (2 points) `Layer.get_nodes()`
2. (6 points) `Layer.get_values()`
3. (7 points) `Layer.set_values()`
4. (6 points) `Layer.get_errors()`
5. (7 points) `Layer.set_errors()`
6. (10 points) `Layer.connect()`
7. (12 points) `NeuralNet.__init__()`

You do not need to provide recipes or docstrings. There will be no code style points.

Testing your code

There are three ways to run the provided code. These are controlled by the constants near the top of the code file.

- Run in CodeSkulptor — In the provided code, set `CODESKULPTOR = True` and `STEPPER = False`. This is best for testing *your code*, as it will display the neural net that your code constructs. However, I recommend using this with the simpler tests with relatively few hidden nodes. Otherwise, it will be slow, and the display will be hard to read.
- Run step-by-step in CodeSkulptor — In the provided code, set `CODESKULPTOR = True` and `STEPPER = True`. This is best for understanding how a neural net behaves during training. This will step through the training process so that you can see how the neural net changes. Again, I recommend using this with the simpler tests with relatively few hidden nodes.

- Run in standard Python — **Download and install the latest Python 2.X from python.org (http://python.org) .** (Don't use Python 3!) The program to use is called IDLE. Download the supplemental import file **comp130_nntests.py (http://rice.codeskulptor.org/#comp130_nntests.py)** , and put it in the same directory as the provided code file. In the provided code, set `CODESKULPTOR = False.` This is best for getting the results needed for the text part of the assignment. It will not display the neural net.

Also, you can control how much output you see by changing the value of `SHOW_OUTPUT`.

When using CodeSkulptor on this assignment, be sure to use the new version (rice.codeskulptor.org), not the older version.

Using IDLE

Windows: Search for "idle" and run the program labeled "IDLE (Python GUI)".

Mac: Open a terminal window and enter "IDLE".

The window that opens is roughly equivalent to CodeSkulptor's right-hand console pane, except that you can also type in it. Use File / New Window to open a second window, which is an editor, similar to CodeSkulptors left-hand editor pane. Copy a paste the provided code into this window, and then save it with the `.py` file extension. Edit the code in the editor window. Use Run / Run Module to run the code. You'll see any printed output in the console window.