



# Homework 5

- Write a program that implements a neural network
  - Input: network architecture
    - Number of inputs
    - Number of hidden units
    - Number of output units
    - Assume fully connected network
  - Input: learning rate
  - Input: training data
    - One example per line as follows:
    - Input: 01000000 Output: 01000000
  - Output
    - Initial weights, Final weights
    - Final output values for each training example (also output the training example)
    - Final total error (sum of squared error for all output units over all examples)
- Run your neural network on the 8x3x8 encoder problem used as an example in this lecture
- You will need to choose a learning rate and run your network until it is able to correctly generate the binary encoding for each input example (i.e. all 1's should be  $> 0.5$  and all 0's should be  $< 0.5$ )
- What to turn in:
  - A single file (text or pdf)
    - Program output
    - Program listing
  - Email answers to [ajain@cc.ucsf.edu](mailto:ajain@cc.ucsf.edu)
  - Homework is due 5/4/04