

NEURAL NETWORKS (ELEC 5240 and ELEC 6240)

HOMEWORK 3

DUE: Thursday September 11

(1) Write program to train a bipolar neuron, which implements the following truth table. Use soft activation function (gain =1) and the perceptron learning rule. As initial weights use (1,1,1,1). Experiment with different values of learning constant so the learning process is completed with smallest number of iterations.

A	B	C	out
-1	-1	-1	1
-1	-1	1	1
-1	1	-1	-1
-1	1	1	-1
1	-1	-1	1
1	-1	1	-1
1	1	-1	-1
1	1	1	-1

Report: Show your work. Draw neuron circuits with weights and report the final sum of squares error.

(2) Write program to train a unipolar neuron to separate the following patterns:

Category with desired output = 1

2,-3,2,-3; -2,1,4,-4; 4,-3,1,-3; 4,-5,-2,2;

Category with desired output = 0

-1,4,-3,5; -3,3,1,3; 2,4,-4,3; -2,-1,3,2

Use soft activation function (gain =1) and the perceptron learning rule. As initial weights use (1,1,1,1, 1).

Report: Show your work. Draw neuron circuits with weights and report the final sum of squares error.