

HW7

Problem 1

a.)

$$w_1 = 1, w_2 = 1, w_3 = 1$$

$$b = -3$$

b.)

$$w_1 = 1, w_2 = 1, w_3 = 1$$

$$b = -1$$

c.)

$$w_1 = -1, w_2 = -1, w_3 = -1$$

$$b = 2$$

d.)

This can't be done because the output is based on input being compared to one other value instead of two and the needed value is within the limits based on the number number of inputs.

Problem 2

a.)

$$VC = 3$$

b.)

$$VC = 3$$

Problem 3

a.)

Hidden layers = 10

Hidden neurons = 1000

b.)

It provided the fastest convergence to very low error rates

c.)

Error rate = 0

d.)

Error rate = 0

e.)

I didn't divide up the training set at all

f.)

I determined convergence by seeing how many iterations of the training set it took for the error to drop to 0/7000. This may seem way too demanding and not be good at finding efficiency of convergence to more reasonable numbers such as convergence to 5/7000, or 72/7000. But my findings seemed to show that setups that led to faster 0/7000 convergences also lead to faster 72/7000 and 5/7000. So the setup I found to be best is all around good at converging to any reasonable error rate.

g.)

Learning rate = 0.0032

h.)

Number of iterations to get to 0/7000 error rate = 477

i.)

These are of the same setup, just different ranges of the iteration axis, the second one is for more detail in the beginning iterations.

