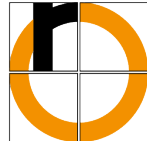


Deep Learning – Perceptron

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Perceptron – NOT

In the lecture we discussed perceptrons for Boolean AND and OR. Draw the graph for a single perceptron (using the step function as activation) that computes the Boolean NOT function. Which values do you choose for the weights?

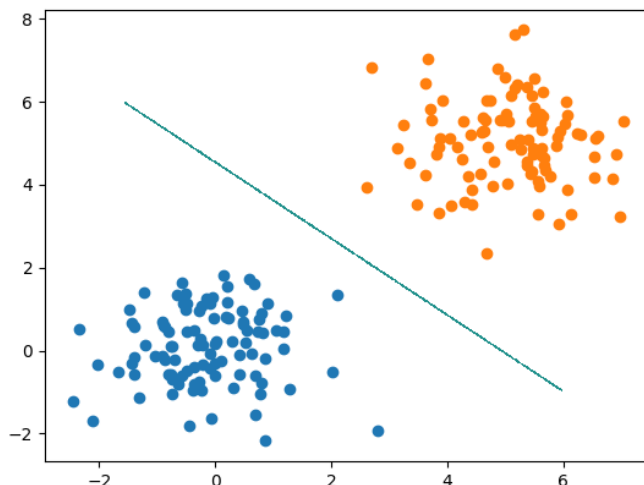
Perceptron Learning

Implement the training algorithm for a single perceptron using the step activation function (0/1 output) with 2D float input (i.e., three weights including bias) in Python. You do not have to start from scratch, a template including a function generating random 2D data that is completely linearly separable (well, most of the time anyway) is provided.

After training, the MRSE on training data should be zero.

The weights can be interpreted as a line defining the decision boundary between the two classes. Plot this line! A function for plotting a line given as an implicit line equation is provided as well.

At the end, the plot should look something like this:



Things to try in addition: change the learning rate, change the weight initialization, change the data generation function such that the samples of the classes overlap (by changing the standard deviation and/or the mean in `random.normal`).