

Implement perceptron learning

I used python and used jupyter notebook for better visualization options. Besides that I used the following packages: numpy, itertools, matplotlib

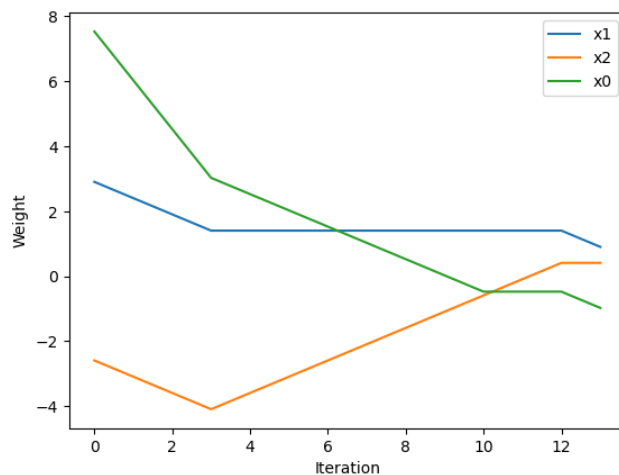
To train the different gates I used a class inheritance and created a parent class Perceptron containing all the important methods for the training process. For the different gates I created child class with a respective change in the output

AND-Gate

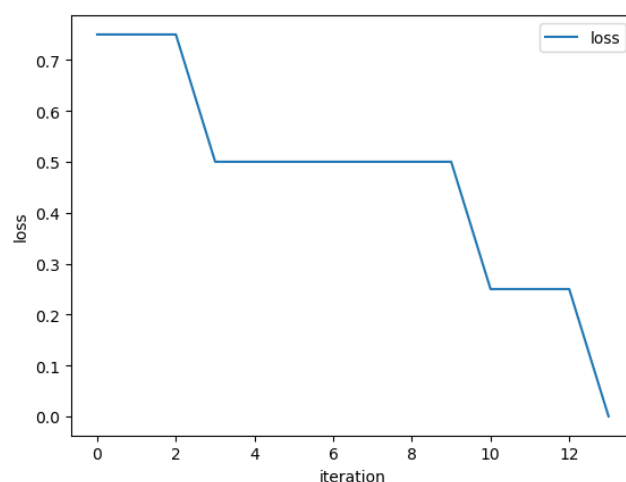
The AND-Gate training was done after 13 iterations with the following weights:

$x_0 = -0.97428108$, $x_1 = 0.9027284$ and $x_2 = 0.41114482$

Weight development



Loss development

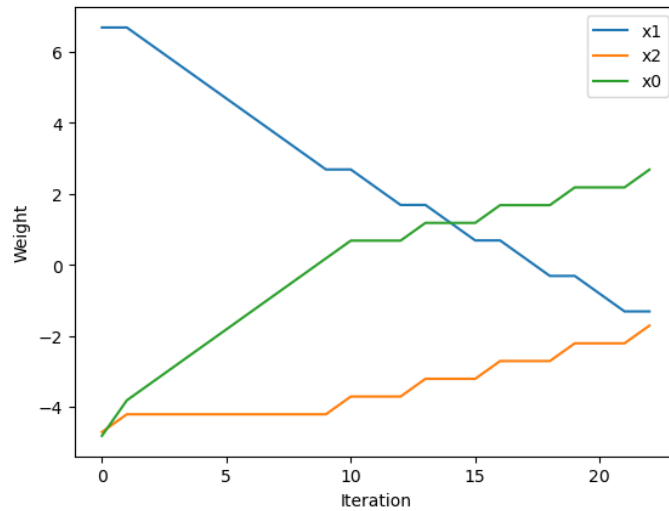


OR-Gate

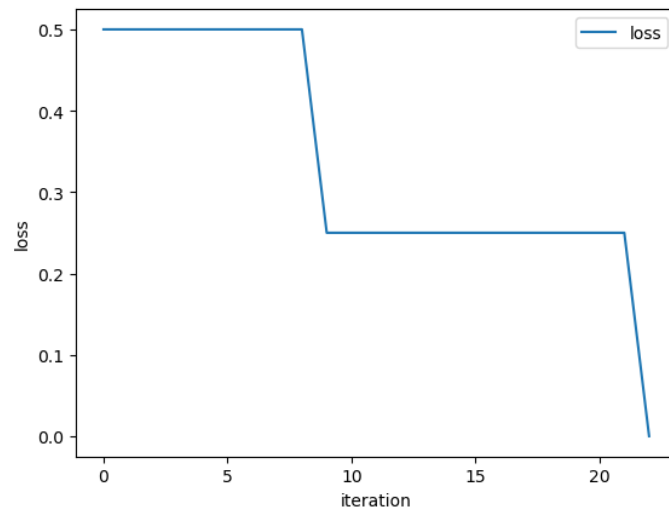
The OR-Gate training was done after 22 iterations with the following weights:

$x_0 = 2.68387481$, $x_1 = -1.31049852$ and $x_2 = -1.70904526$

Weight development



Loss development



XOR-Gate

I also tried the XOR-Gate, but the code did not terminate. A XOR-Gate is therefore not possible with just one perceptron.