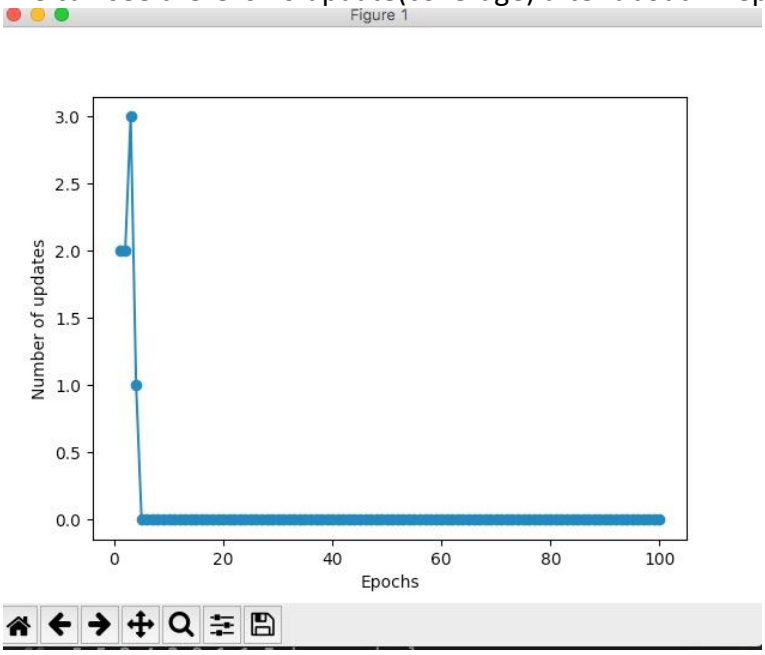
There are two data sets to use test the classifier: Iris and the Breast Cancer Wisconsin Data Set. The Iris dataset : Sample size is 150. 70% is Training and 30% is Testing. Petal length and sepal length is the features and Flower type is the label. We use the Iris-seosa as the positive class, and the rest is negative class

Result :
Perceptron (eta=0.05, n_iter=100)
Total error is 0
Accuracy is 100%

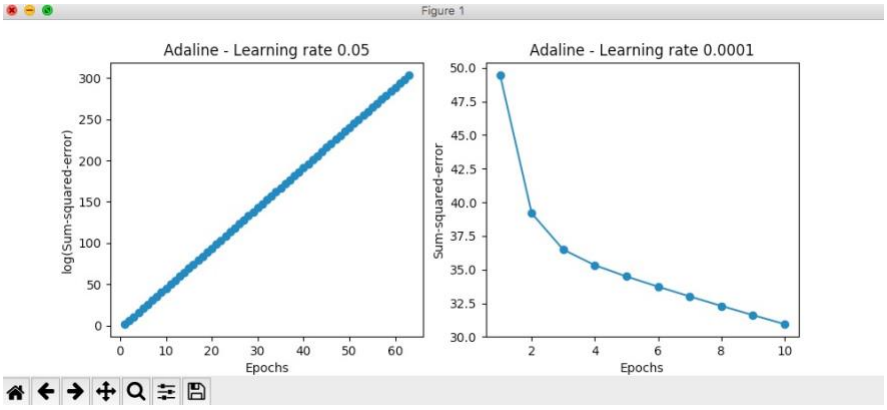
We can see there is no update(coverage) after about 12 epochs, that's why it got zero error.



Adaline
(eta=0.05, n_iter=100)

total error is 29

Accuracy is 0.35555555555555557 %



The error is getting more because the learning rate is still too big. Thus, it went to wrong direction. If the learning rate is 0.0001, it would get better result.

SGD
(eta=0.05, n_iter=100)

total error is 15

Accuracy is 0.6666666666666666 %

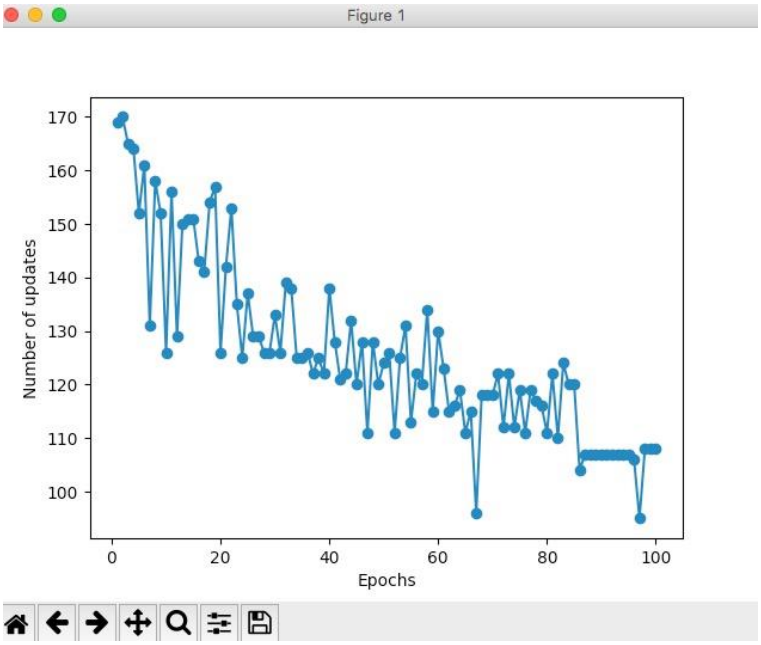
This is better result than Adaline, may be the calculation of the current sample is better than whole sample in Adaline.

The Breast Cancer dataset : Sample size is 569. 70% is Training and 30% is Testing. Radiu_mean, texture_mean , perimeter mean, area mean and smoothness mean is the features and Diagnosis is the label. We use the M(malignant) as the positive class, and the B (benign) is negative class

Perceptron
(eta=0.05, n_iter=100)

total error is 39

Accuracy is 0.7719298245614035 %



The number of update is decreasing when the iteration number is increasing. That's why we got 77% accuracy. We may get better result we increase number of iteration.

Adaline
(eta=0.05, n_iter=100)

total error is 39

Accuracy is 0.7719298245614035 %

SGD
(eta=0.05, n_iter=100)

total error is 39

Accuracy is 0.7719298245614035 %

Those result are the same. I wonder if something wrong on my program or the random seed is the same cause the problem. Moreover the data is not scatarified and randomized may also casue the acurrcy of the result.