

Adam Noack hw5

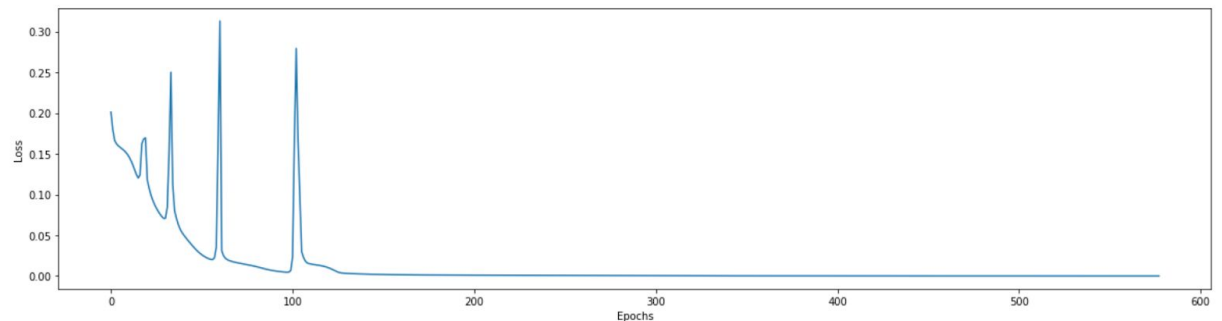
1) These results were obtained with a learning rate of 4.

Converted input data:

```
train X: [[ 0.9      0.1      0.1      0.5      0.9      0.1      0.9
 0.36666667 0.1      ]
 [ 0.9      0.1      0.1      0.9      0.1      0.1      0.1
 0.9      0.63333333]
 [ 0.1      0.9      0.1      0.5      0.1      0.1      0.1
 0.1      0.1      ]
 [ 0.9      0.1      0.9      0.9      0.1      0.9      0.1
 0.9      0.36666667]
 [ 0.9      0.1      0.9      0.9      0.9      0.1      0.9
 0.36666667 0.9      ]
 [ 0.1      0.9      0.1      0.5      0.5      0.9      0.9
 0.63333333 0.1      ]
 [ 0.1      0.9      0.1      0.1      0.1      0.9      0.1
 0.1      0.1      ]
 [ 0.1      0.1      0.1      0.5      0.5      0.9      0.9
 0.9      0.1      ]
 [ 0.1      0.9      0.9      0.9      0.1      0.9      0.1
 0.1      0.9      ]
 [ 0.9      0.9      0.9      0.9      0.9      0.1      0.9
 0.63333333 0.36666667]
 [ 0.1      0.1      0.1      0.1      0.1      0.1      0.1
 0.9      0.1      ]
 [ 0.9      0.9      0.9      0.9      0.1      0.1      0.1
 0.1      0.63333333]]
train Y: [ 0.9 0.1 0.9 0.9 0.1 0.9 0.1 0.9 0.1 0.1 0.1 0.9]
```

Loss graph and final weight values:

Step: 577 Loss: 0.000010



Epochs needed for loss to converge to $< 10^{-5}$: 578

```
Final weight values:
W1:[[ 1.13680965 -3.16794605 1.62294775]
 [-2.14465727 0.88708239 -3.7137994 ]
 [-0.98405439 -0.3181973 -0.97725814]
 [ 5.07757554 -3.38375755 -0.61481392]
 [-1.63236413 -1.06749445 3.59580961]
 [ 1.32172369 2.64351889 -5.92304362]
 [ 2.31453285 -3.00918019 2.53609766]
 [-5.20919751 -2.10713021 0.32148008]
 [-5.01896479 2.26637318 0.3378027 ]]
W2:[[ 7.26018589]
 [-4.37327705]
 [-3.87395176]]
```

2) .ipynb attached in email