Wargen Guittap 5004493060
Austin Merrick 2001003855

Assignment #3 Report

- ==The dataset you used, its source and characteristics.==

Data source:
https://archive.ics.uci.edu/ml/datasets/banknote+authentication

We use the follow as features:
  1. variance of Wavelet Transformed image (continuous)
  2. skewness of Wavelet Transformed image (continuous)
  3. curtosis of Wavelet Transformed image (continuous)
  4. entropy of image (continuous)

To predict:
  banknote is genuine or forged

- ==The solution " $\widehat{w}$ "==

$$\begin{pmatrix} -3.86421877 \\ -8.25139201 \\ -9.11510231 \\ -8.24817781 \\ -0.65931195 \end{pmatrix}$$

Intercept:
  w0
  -3.86421877

Coefficients:
  w1   w2   w3   w4
  [-8.25139201 -9.11510231 -8.24817781 -0.65931195]

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- The learning rate(s) you used for gradient descent and how many iterations it took for gradient descent to converge.

Using the sklearn "optimal" learning rate of 1/(alpha* (t+t_0)), it converged after 17 iterations.

- Relevant evaluation metrics for the training dataset

Accuracy = 0.9890710382513661

- Relevant evaluation metrics for the test dataset

Accuracy = 0.985014598540146