

Homework 9

Reading:
Logistic Regression Materials
Patrick Loeber [video](#) / [code](#)
Due Wed, Jan. 31, 17:00

Submission Instructions

Submit exercise files to Moodle as usual. Show your work for full credit. Please write legibly.

Exercise 1 (6 pts)

After training a binary logistic regression model, the final weights and bias are:

$$\mathbf{w} = \begin{bmatrix} 2 \\ 3 \\ 1 \end{bmatrix} \quad \text{bias} = -5$$

Calculate the model's predicted values of the following test data, using a decision boundary of .5:

$$\mathbf{X}_{test} = \begin{bmatrix} 1 & 0 & 2 \\ 1 & 2 & 3 \end{bmatrix}$$

Exercise 2 (10 pts)

Suppose you are training a binary logistic regression model (using a learning rate of .1) on the following training data:

$$\mathbf{X}_{train} = \begin{bmatrix} 2 & 3 & 4 \\ 2 & 2 & 3 \end{bmatrix} \quad \mathbf{y}_{train} = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$$

At epoch x , the weights and bias are:

$$\mathbf{w} = \begin{bmatrix} 2 \\ .5 \\ 1 \end{bmatrix} \quad \text{bias} = -7.5$$

Calculate the weights and bias at epoch $x+1$ (i.e. after updating the weights and bias once).