Homework 8

Reading:
Linear Regression Materials
Patrick Loeber video / code

Due Wed, Jan. 24, 17:00

Submission Instructions

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

Exercise 1 (4 pts)

A linear regression model was trained on a 3-feature dataset. The final weights and bias after training are:

$$\boldsymbol{w} = \begin{bmatrix} 1 \\ 2 \\ -3 \end{bmatrix} \qquad bias = 4$$

Calculate the predicted values of the following test data, which contains two samples.

$$\boldsymbol{X\_test} = \begin{bmatrix} 3 & 1 & 2 \\ 1 & 4 & 2 \end{bmatrix}$$

Exercise 2 (6 pts)

Suppose you are training a linear regression model (using a learning rate of .1) on the following 3-feature training data:

$$\boldsymbol{X\_train} = \begin{bmatrix} 2 & 3 & 2 \\ 1 & 2 & 2 \end{bmatrix} \qquad \boldsymbol{y\_train} = \begin{bmatrix} 5 \\ 3 \end{bmatrix}$$

At epoch x, the weights and bias are:

$$\boldsymbol{w} = \begin{bmatrix} 3 \\ 1 \\ 2 \end{bmatrix} \qquad bias = 2$$

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