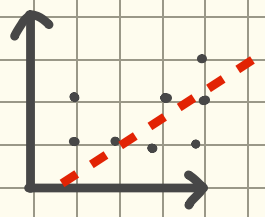
Linear Regression



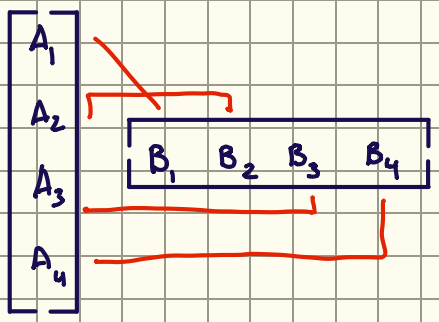
1. Define your inputs:

   Learning Rate: how much "influence" will errors have
   Loss Function: how do you define "loss"?
   Features: How many inputs are we dealing with

2. setup random weights where len(weights) = features and a bias integer

Epoch →

3. Predict output by doing the following:



$$+ \text{bias} = \sum_{i=1}^{4} A_i B_i + \text{bias}$$

4. Calculate Loss where y_1 = predictions, y_2 = true values by:

Mean Absolute Error (MAE)

$$\frac{\sum_{i=1}^{n} |y_{i,1} - y_{i,2}|}{n}$$

Mean Squared Error (MSE)

$$\frac{\sum_{i=1}^{n} (y_{i,1} - y_{i,2})^2}{n}$$

5. Change Weights

dw = change to weights
db = change to bias

MAE

$$dw = \frac{1}{n} \cdot [\text{inputs}^T \cdot \text{sign}(\text{diff})]$$

$$db = \frac{1}{n} \cdot \Sigma \text{sign}(\text{diff})$$

MSE

$$dw = \frac{2}{n} \cdot [\text{inputs}^T \cdot \text{diff}]$$

$$db = \frac{2}{n} \cdot \Sigma \text{diff}$$

weights -= learning rate · dw
bias -= learning rate · db

Epoch →