COMP4901I Assignment 1 Twitter Sentiment Analysis For Sentence-Level Text

Cheng Chi Fung
cfchengac@connect.ust.hk

Abstract

In this assignment, we used supervising learning to train an Artificial Intelligence to perform sentiment analysis for sentence-level text. We used logistic regression to estimate the probability that de-scribes the likelihood of a positve sentence. Since its accuracy was not good enough. We performed serveral data pre-processing procedures such as Bi-gram and SGD with momentum to further improve its convergence.

1 Logistic Regression

1.1 Gradient of the formula

For logistic regression, the gradient formula that we had used was the follows.

$\frac{\partial J}{\partial b} = \frac{1}{m}\sum_{i=1}^{m}(a^{(i)} - y^{(i)})$

$\frac{\partial J}{\partial w} = \frac{1}{m}X(A-Y)^T$

where,

$A = sigmoid(w^T X + b) = (a^{(0)}, a^{(1)}, ..., a^{(m-1)}, a^{(m)})$,

X is the inputs matrx of the data,

Y is the labels matrix of the data,

$y^{(i)}$ is the label for data i,

w is the weights matrix,

b is the bias matrix,

m is the size of the data