

TDT4171: Assignment 4

Adrian Langseth

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1 Using sklearn

Time taken: 65.56284475326538s

BernoulliNB Classifier: 0.811067357195391

Decision Tree Classifier: 0.8535256803138024

Parameters:

Hashing Vectorizer

stop_words='english' defines the language for accurate removal of the stop-words.

analyzer='word' is necessary for the stopword removal.

Bernoulli Naïve Bayes

In construction of the naive Bayes network, i used the default parameters.

Decision Tree Classifier

max_depth = 32 is a balancing of efficiency and accuracy.

criterion= 'entropy' Criterion is the function to measure the quality of a split and entropy signals information gain.

2 Using keras

```
Epoch 1/3
393053/393053 [=====] - 13602s
35ms/sample - loss: 0.3758 - acc: 0.8474
Epoch 2/3
393053/393053 [=====] - 49339s
126ms/sample - loss: 0.2721 - acc: 0.9093
Epoch 3/3
393053/393053 [=====] - 19619s
50ms/sample - loss: 0.2421 - acc: 0.9154
130528/130528 [=====] - 6137s
44ms/sample - loss: 0.2526 - acc: 0.9127
```

Parameters:

Layers

The dense layer is made with sigmoid activation as is default.

Compiling

Te compiling is done with 'adam' as the optimizer, and it judges loss on binary cross entropy. We must also judge it on accuracy as it is passed as the metrics parameter.

Model

The model is fit using 3 epochs.

3 What is the reason for the large improvement in accuracy from the Naive Bayes/Decision Tree models to the LSTM?

If we consider the reviews "Food was not bad, would recommend to anyone" and "Food was bad, would not recommend to anyone". Naive Bayes/Decision Tree models would not consider these any different, despite teir sentiment

being obviously different. LSTM models take into consideration the word placement, which is why it is much more accurate.