Sarcasm Detection (Project Progress)

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Progress

As part of the project work we have used both Machine Learning and Deep Learning approaches to solve the problem. Based on our analysis we found that among different machine learning algorithms, **Random Forest Classifier** performed best after some hyperparameter tuning. Below are metrics obtained after running different algorithms.

Approach	Algorithm	Precision	Recall	F1
Machine Learning	LogisticRegression	0.6723952738990333	0.6955555555555556	0.6837793555434188
Machine Learning	SGDClassifier	0.6762820512820513	0.7033333333333334	0.6895424836601308
Machine Learning	LinearSVC	0.6652631578947369	0.7022222222222222	0.6832432432432433
Machine Learning	MLPClassifier	TBD	TBD	TBD
Machine Learning	RandomForest Classifier	0.6424825174825175	0.8166666666666667	0.7191780821917808

After this, we decided to change the threshold in which we determined whether the tweet was sarcastic or not, by lowering the confidence level necessary.

Threshold	F1
0.5	0.7191780821917808
0.4	0.7126436781609196
0.48	**0.7265952491849093**
0.46	0.7231386535889435
0.44	0.7187904967602592

From this, we found the RandomForestClassifier with **1000 trees** and **0.48 threshold.** Eventually, the Deep Learning based approach gave the best performance results.

Approach	Algorithm	Precision	Recall	F1
Deep Learning	Convolutional Neural Networks	0.6227867590	0.89888888	0.7357889949977261

Both the tuned Random Forest(Machine Learning) and Convolutional Neural Network(Deep Learning) are able to get F1 scores above the baseline of 0.723.

Remaining Tasks

We already crossed the baseline, but if we have time we could explore approaches in Deep Learning and improve CNN by tuning the hyperparameters. We could also explore different tokenization techniques and draw different insights from the tweets. For example, tokening and separating emojis and hashtags may allow us to bring significant improvements to sarcasm detection.

Challenges and Issues

None.