Sarcasm detector using machine learning algorithms

Motivation

Sarcasm is a sophisticated form of irony that is commonly found in social networks. It highly disrupts computational systems that harness this data to perform tasks such as sentiment analysis, opinion mining, author profiling, and harassment detection.

Sarcasm detection is an essential tool in the text classification for dealing with this sophisticated emergent. The performance of sarcasm classifier is important for accurate predictions when processing expressions in the textual data.

Our goal is to develop a new model to implement the sarcasm detection with good performance.

Dataset

	tweet	sarcastic	rephrase	sarcasm
0	The only thing I got from college is a caffein...	1	College is really difficult, expensive, tiring...	0.0
1	I love it when professors draw a big question ...	1	I do not like when professors don't write out ...	1.0
2	Remember the hundred emails from companies whe...	1	I, at the bare minimum, wish companies actuall...	0.0
3465	I'm finally surfacing after a holiday to Scotl...	0	NaN	NaN
3466	Couldn't be prouder today. Well done to every ...	0	NaN	NaN
3467	Overheard as my 13 year old games with a frien...	0	NaN	NaN

Sarcasm labels are provided by the authors themselves.

Authors also rephrased the sarcastic text to convey the same intended message without using sarcasm.

Task

The main goal of this project is to determine the sarcasm in a tweet.

The task is to build up a model to determine sarcasm given a sarcastic text and its non-sarcastic rephrase while two texts convey the same meaning

	tweet	sarcastic	rephrase	sarcasm
0	The only thing I got from college is a caffein...	1	College is really difficult, expensive, tiring...	0.0
1	I love it when professors draw a big question ...	1	I do not like when professors don't write out ...	1.0
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Baseline

Several common mature methods on binary classification are listed as follows:

1. LogisticRegression
2. GaussianNB
3. KNeighborsClassifier
4. SVC
5. DecisionTreeClassifier
6. Random

Methodology

For the task, we consider the main metrics the same as in iSarcasmEval, which is accuracy.

Because recognition occurs within pairs, where everything is balanced by definition and accuracy = the proportion of pairs where we correctly identified sarcasm.

1. data preprocess
2. models
3. benchmark/evaluation

Experimental Plan

1. Fine-tuning pre-trained language models like BERT and GPT2 can be effective for sarcasm detection in tweet pairs.
2. Logistic Regression and Support Vector Machines (SVM) trained on pre-trained language model embeddings can also achieve reasonable results.
3. Using GPT-3.5 turbo.

Expectation:

Pre-trained language models like BERT and GPT2 even GPT3.5-turbo will be the most effective methods for sarcasm detection.

References

- Project tasks: https://sites.google.com/view/semeval2022-isarcasmeval
- Dataset: https://github.com/iabufarha/iSarcasmEval
- P. Verma, N. Shukla and A. P. Shukla, "Techniques of Sarcasm Detection: A Review," *2021 International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE)*, Greater Noida, India, 2021, pp. 968-972, doi: 10.1109/ICACITE51222.2021.9404585.