Using NLP and modeling Techniques to Determine the Source of Reddit Posts

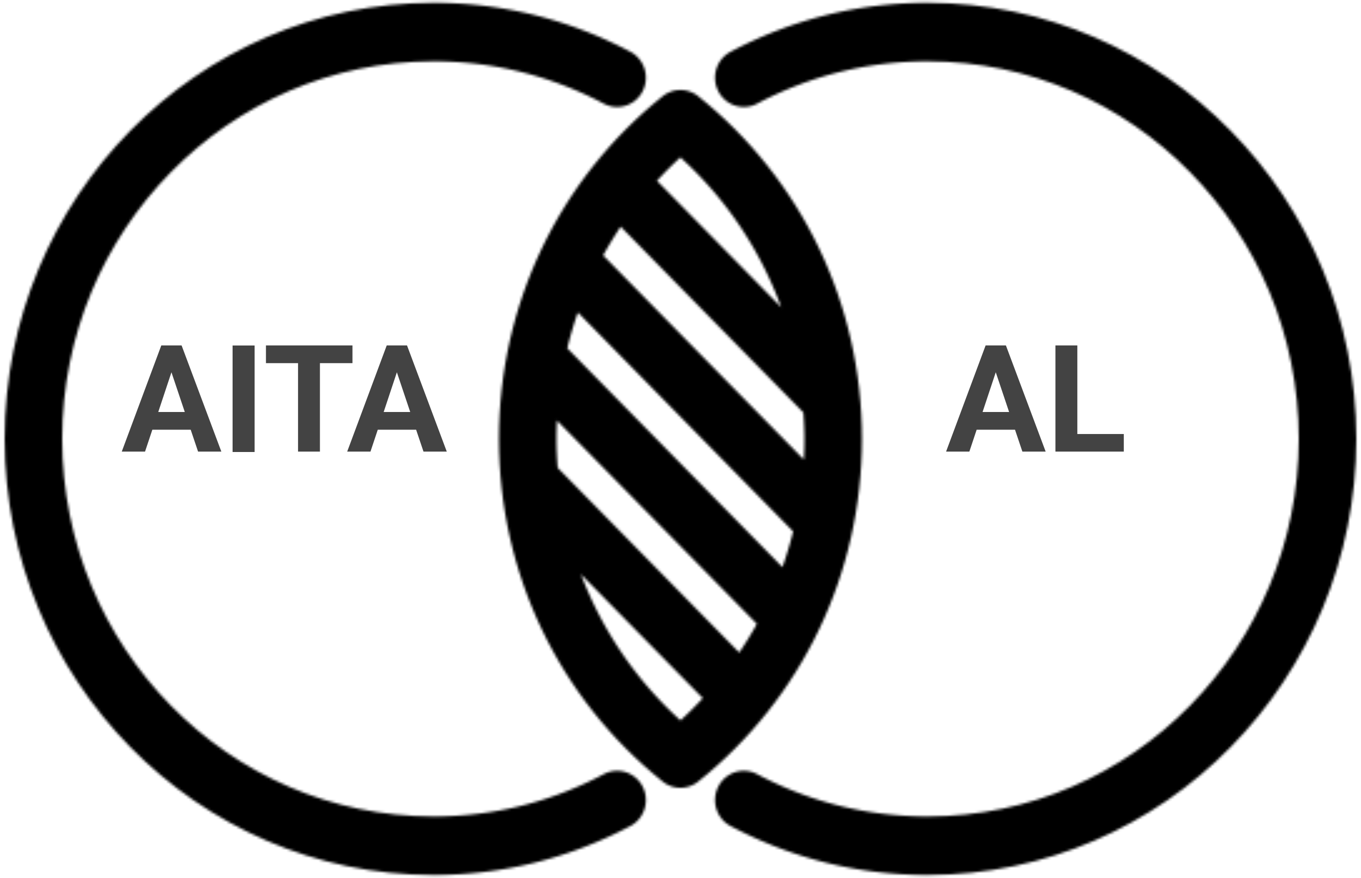
By: Marta Fuentes-Filp

The subreddits

Am I the Asshole?
(AITA)
for bringing my sister in law’s wallet to the restaurant when she conveniently always forgets it…?

Ask Lawyers

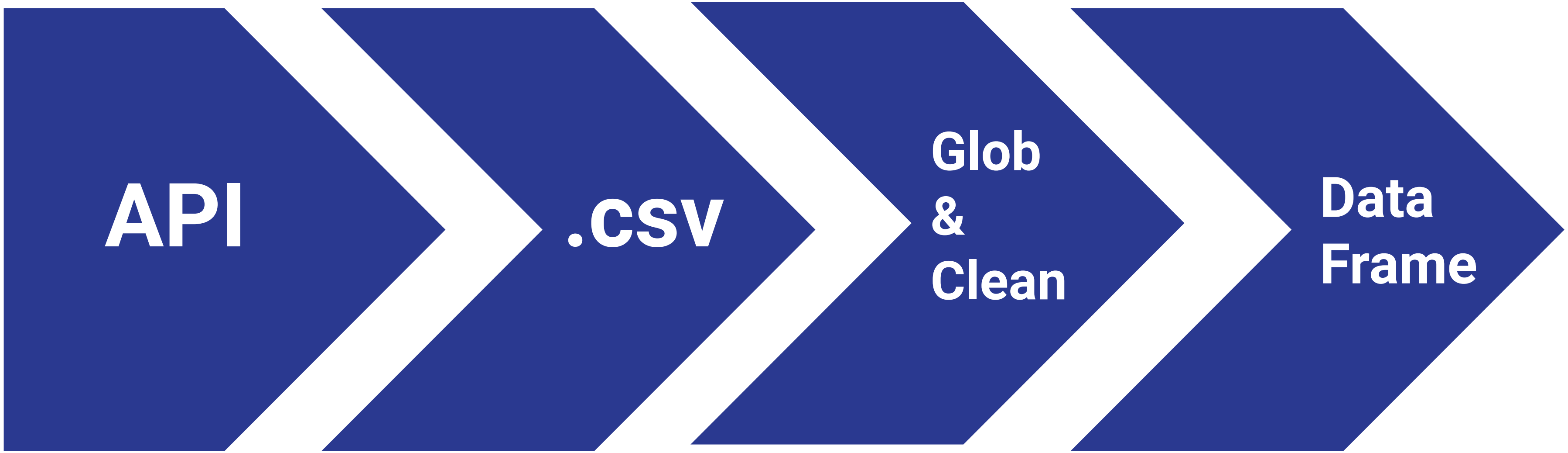
(AL)
Assume somebody found buried treasure on someone else's land, and started dressing up as a ghost to scare people …



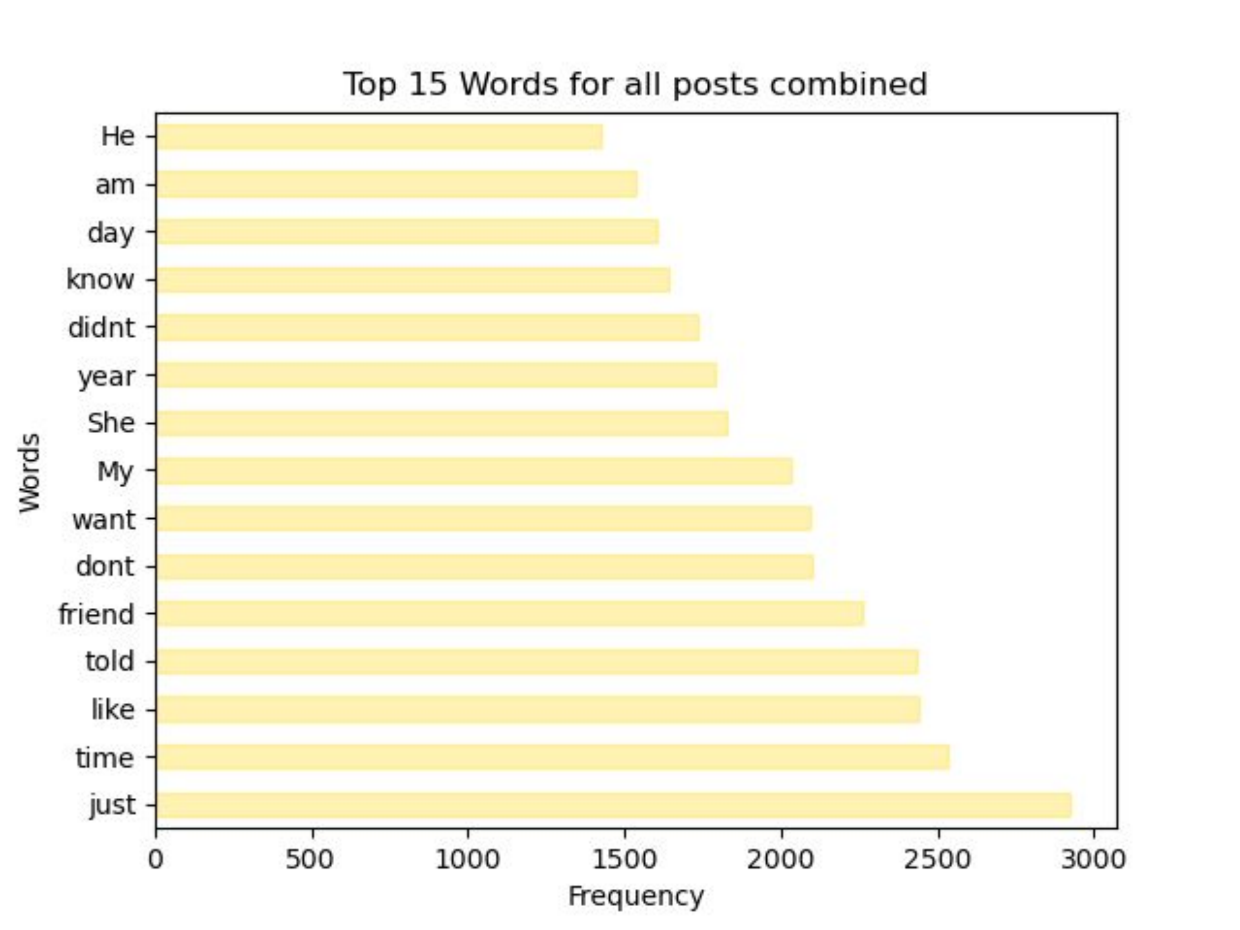
AITA

AL

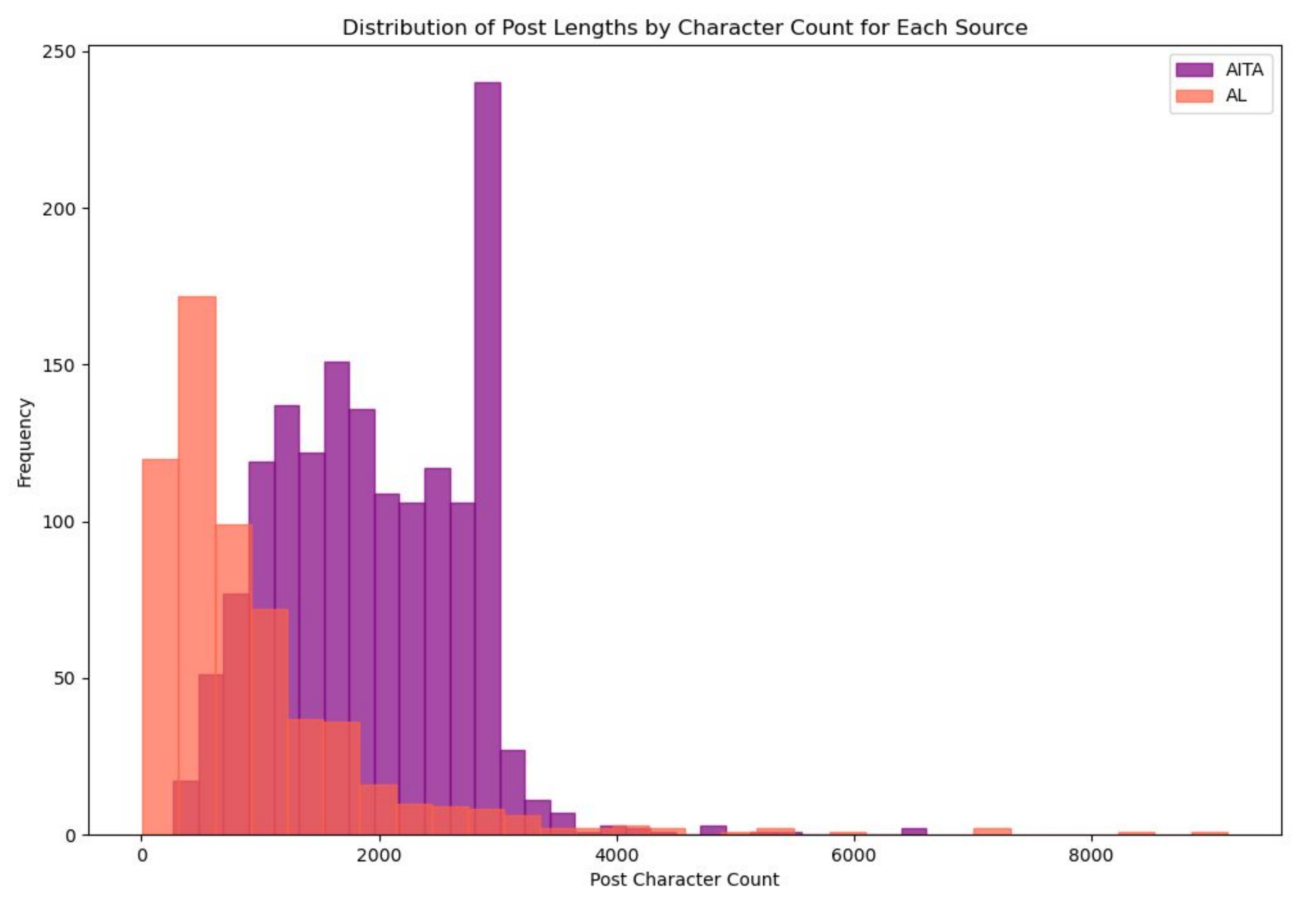
Data Preparation



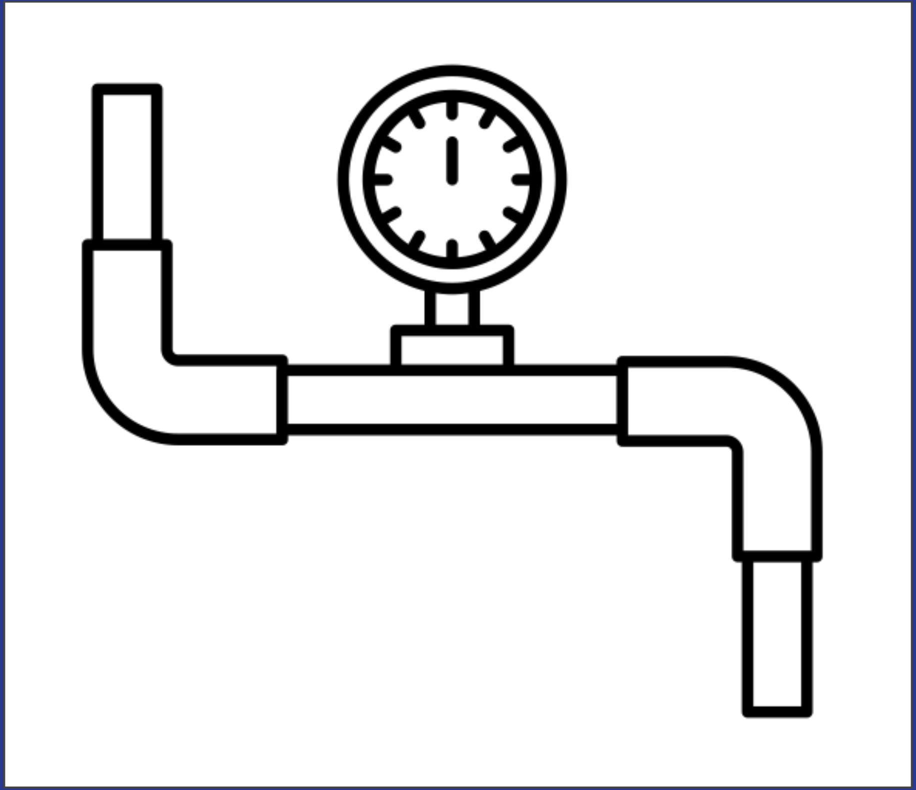
Text Processing & Analysis



Text Processing & Analysis



Text Processing & Analysis



Natural Language Processing

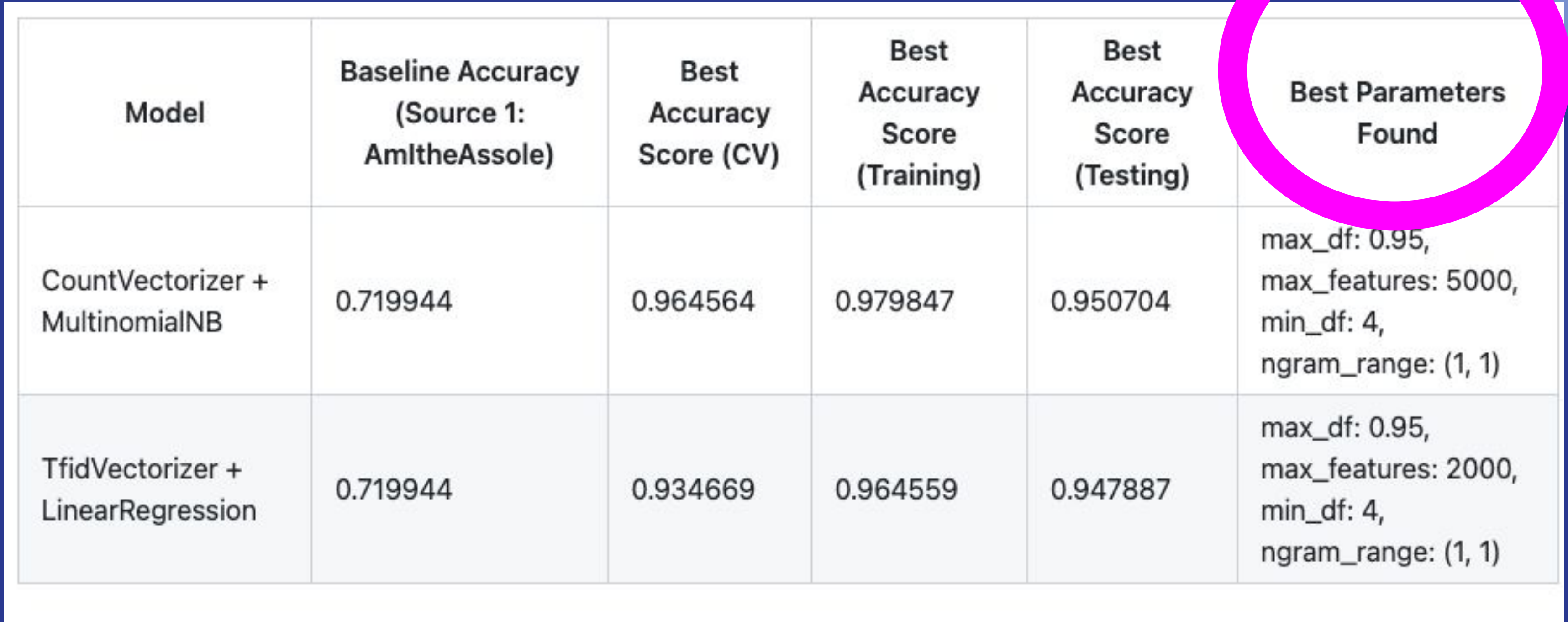
+

Classification Model

+

Hyperparameter Optimization

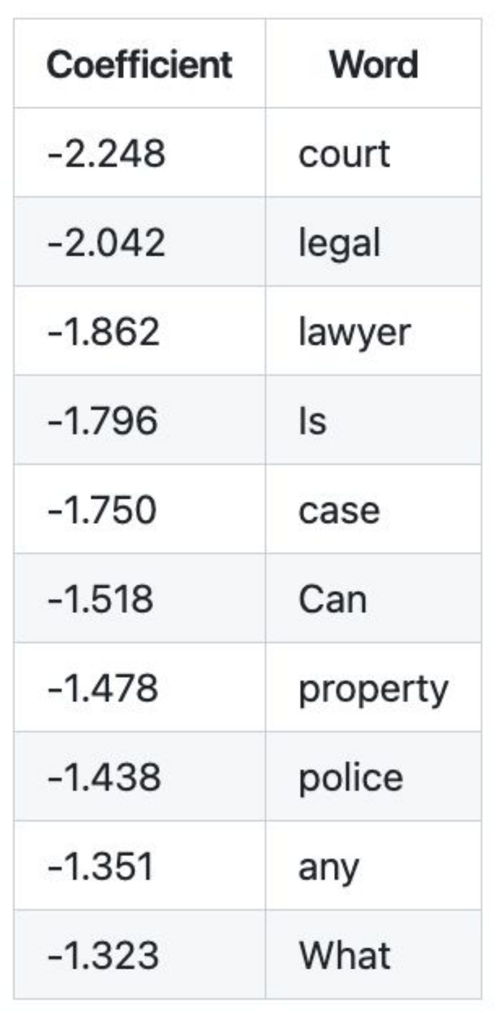
Initial metrics and parameters



Model	Baseline Accuracy (Source 1: AmItheAssole)	Best Accuracy Score (CV)	Best Accuracy Score (Training)	Best Accuracy Score (Testing)	Best Parameters Found
CountVectorizer + MultinomialNB	0.719944	0.964564	0.979847	0.950704	max_df: 0.95, max_features: 5000, min_df: 4, ngram_range: (1, 1)
TfidVectorizer + LinearRegression	0.719944	0.934669	0.964559	0.947887	max_df: 0.95, max_features: 2000, min_df: 4, ngram_range: (1, 1)

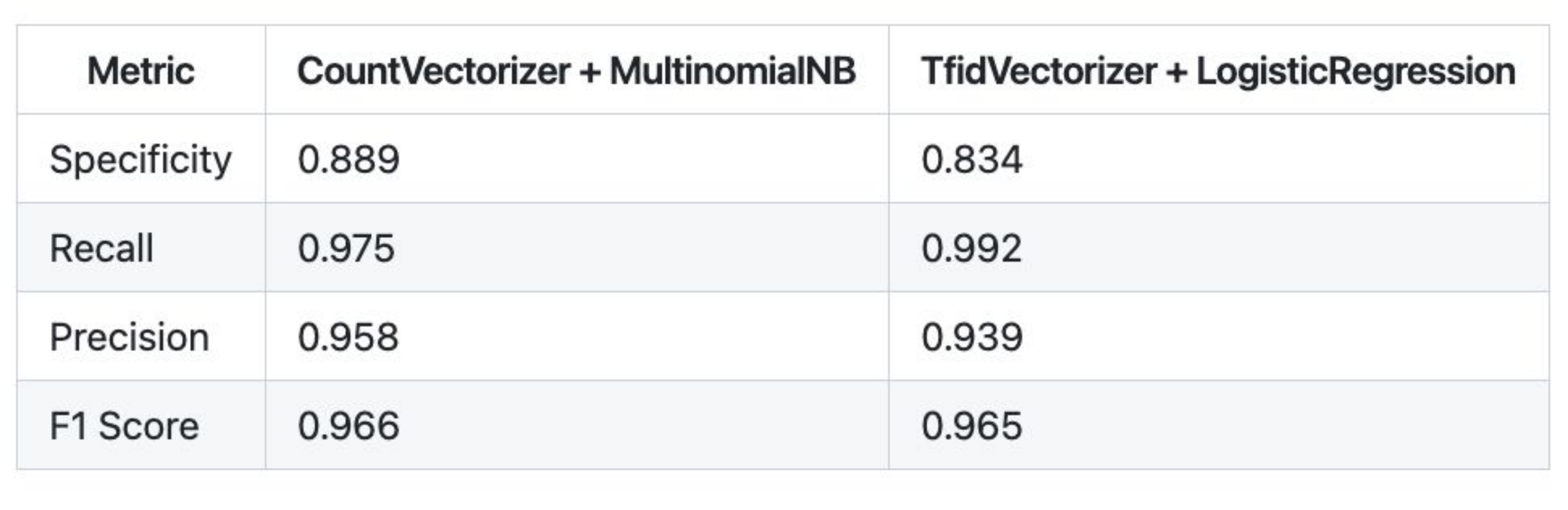
Inferential insights from my Logistic Regression model:

- Negative coefficients suggest words related to…



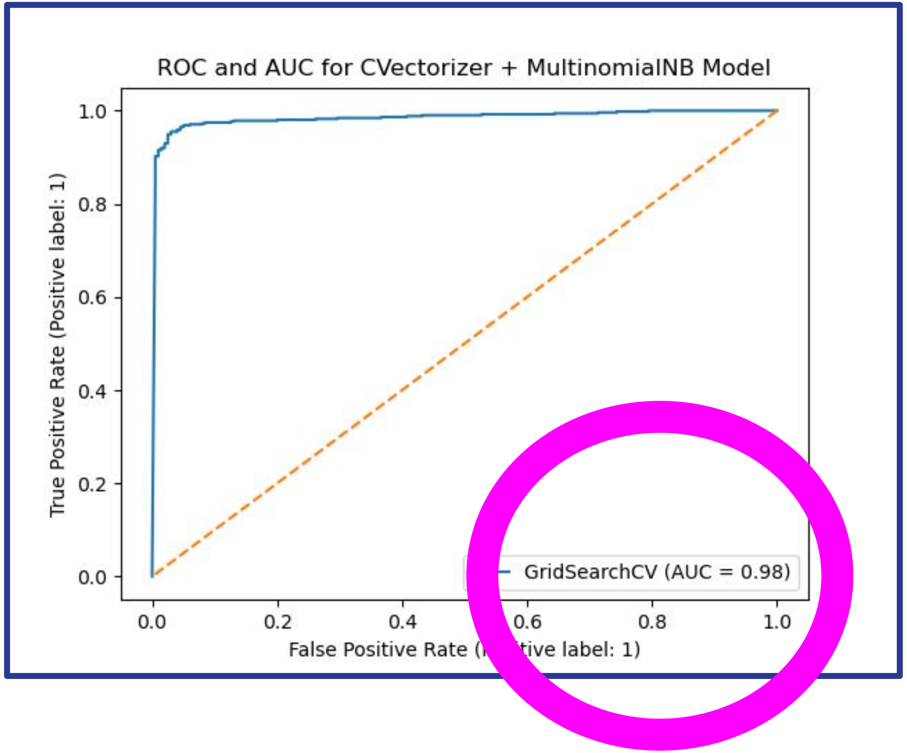
Coefficient	Word
-2.248	court
-2.042	legal
-1.862	lawyer
-1.796	Is
-1.750	case
-1.518	Can
-1.478	property
-1.438	police
-1.351	any
-1.323	What

Metrics beyond Accuracy

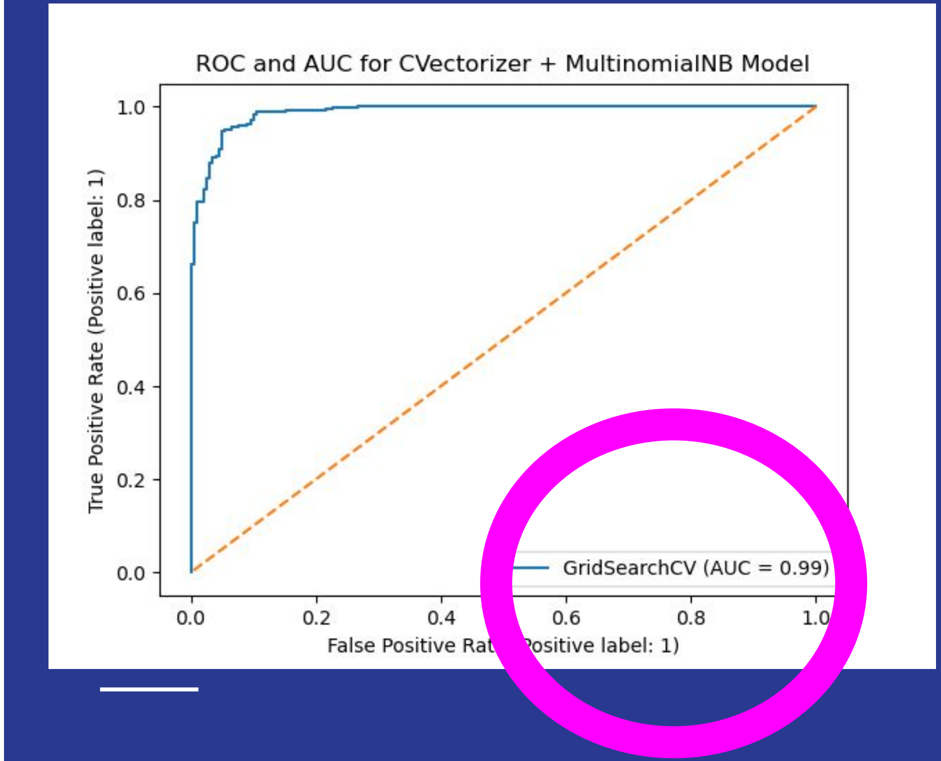


Metric	CountVectorizer + MultinomialNB	TfidVectorizer + LogisticRegression
Specificity	0.889	0.834
Recall	0.975	0.992
Precision	0.958	0.939
F1 Score	0.966	0.965

MODEL 1



MODEL 2



Next Steps...

More Data

Custom Pre-processors

SpaCy & Friends

- What was the effect of the custom preprocessor used?

Beyond:

- CountVectorizer and TFIDFVectorizer...
- MultinomialNB and LogisticRegression

Thank you

What Questions Do You Have?