Sentiment Analysis (Classification)

Twitter Airline Sentiment Dataset

Project Overview

- Goal: Classify tweets into positive, neutral, negative
- Dataset: Airline Twitter Sentiment
- Models compared: Logistic Regression, Naive Bayes, Random Forest, SVM
- Features: Bag-of-Words and TF-IDF
- Evaluation: Accuracy, Precision, Recall, F1

Steps

- Load and clean text data
- Tokenization and preprocessing
- Vectorization (BoW, TF-IDF)
- Train multiple classifiers
- Evaluate using classification reports and confusion matrices

Method

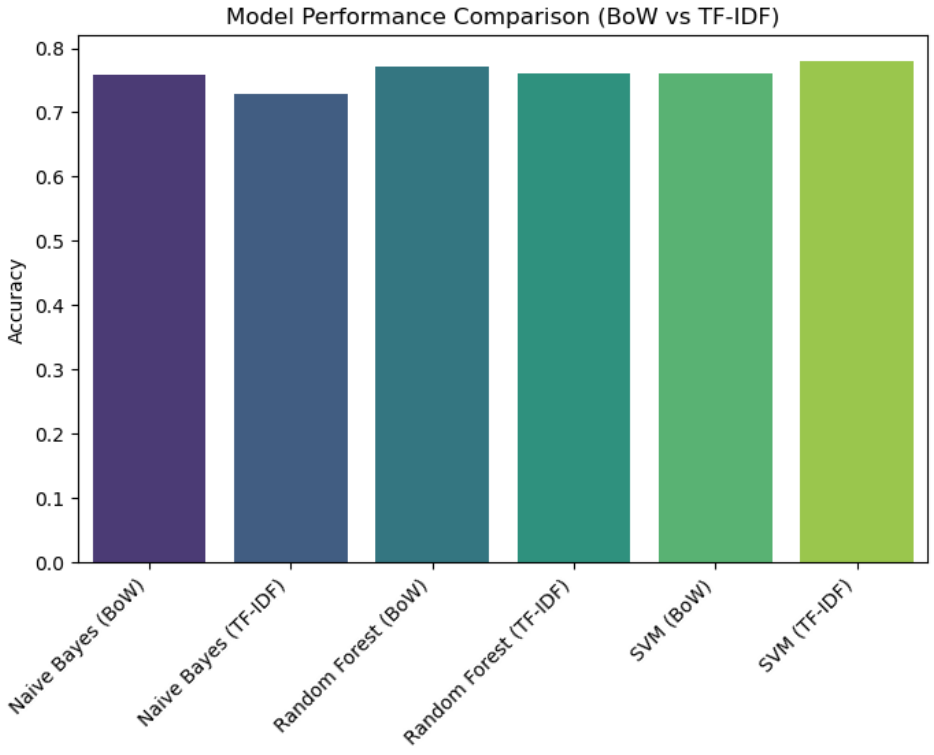
- Logistic Regression, Naive Bayes, Random Forest, SVM
- Preprocessing: Lowercasing, stopword removal, tokenization
- Features: Bag-of-Words and TF-IDF

Results

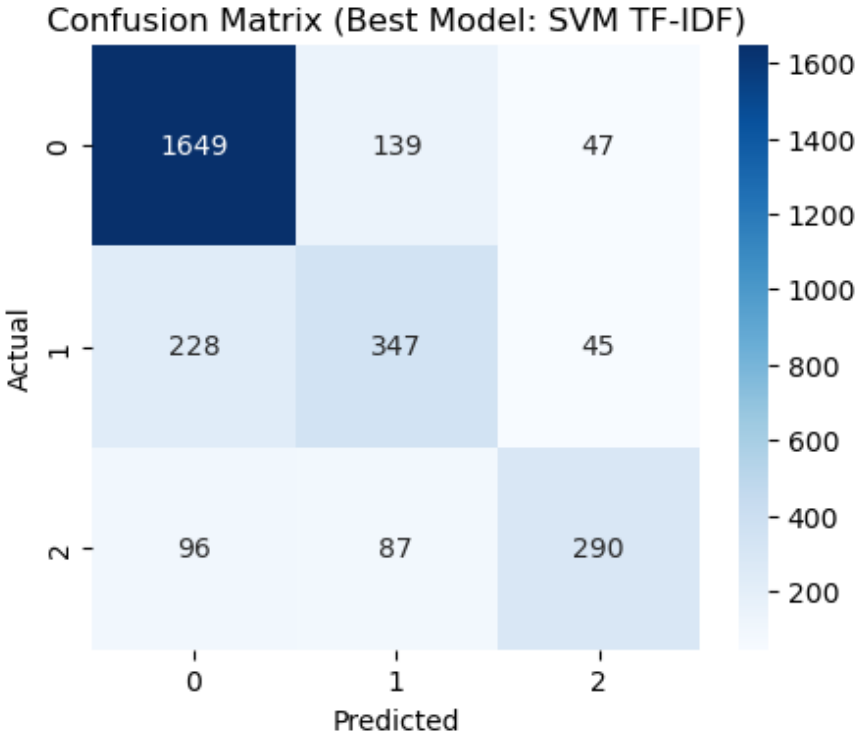
- Latest classification report:

	precision	recall	f1-score	support
negative	0.80	0.94	0.86	1835
neutral	0.66	0.47	0.55	620
positive	0.82	0.57	0.67	473
accuracy			0.78	2928
macro avg	0.76	0.66	0.69	2928
weighted avg	0.77	0.78	0.77	2928

Performance Comparission



Confusion Matrix



Frequent Words

Conclusion

- Best performance: SVM with TF-IDF (~78% accuracy)
- Negative sentiment predicted best
- Neutral class remains most difficult
- Future: Handle imbalance, try deep learning models