Brainwave Matrix Solutions Internship – Task 2

Project: Twitter Sentiment Analysis using Python and Power BI

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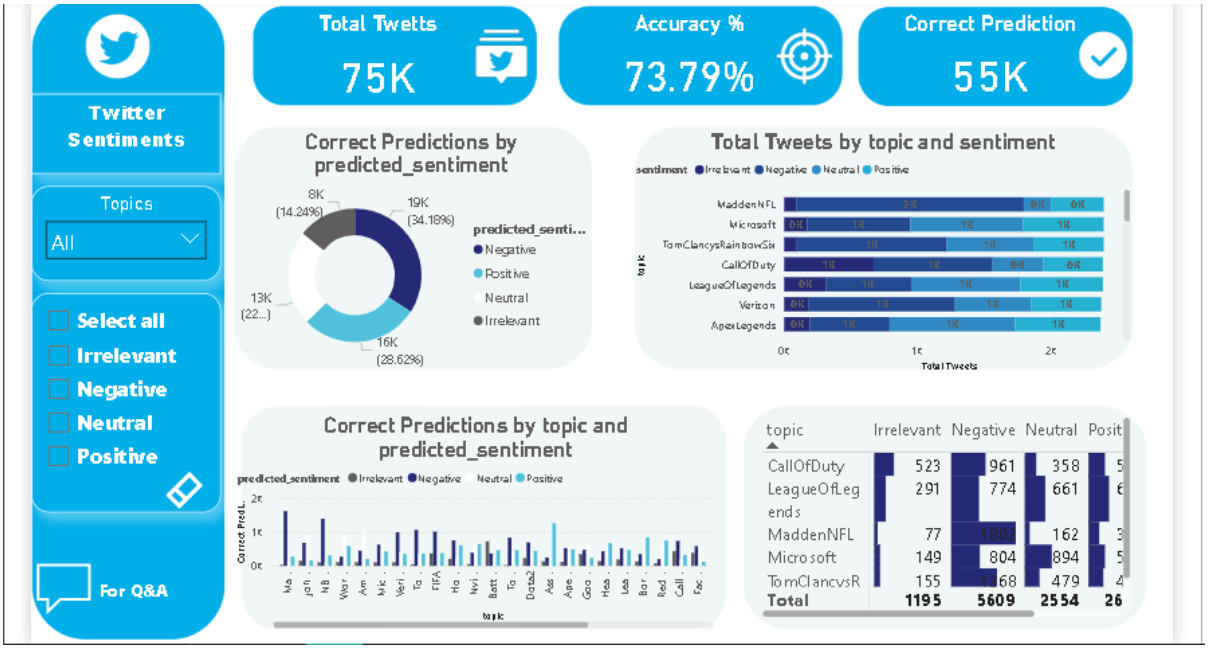
This report presents a detailed overview of Task 2 for the Brainwave Matrix Solutions internship. The objective was to perform sentiment analysis on Twitter data using Natural Language Processing (NLP) techniques and visualize the results through an interactive Power BI dashboard. The project involved building a machine learning model (Logistic Regression) to classify tweets as Positive, Negative, Neutral, or Irrelevant, followed by creating insightful visuals in Power BI.

1. Data Preparation
• Imported Twitter datasets (`twitter_training.csv` and `twitter_validation.csv`).
• Cleaned text data by removing punctuation, URLs, and special characters.
• Encoded sentiments and applied feature extraction using TF-IDF.

2. Model Building
• Used Logistic Regression with scikit-learn for sentiment classification.
• Evaluated model performance on the validation dataset achieving 73.79% accuracy.

3. Power BI Dashboard
• Imported prediction results into Power BI.
• Created visuals such as KPIs, Pie Chart, Clustered Bar Chart, Matrix Table, and Decomposition Tree.
• Applied DAX measures for metrics like Accuracy %, Total Tweets, and Correct Predictions.

Sample DAX Measures:
```
Total Tweets = COUNTROWS('twitter_sentiment_results')
Correct Predictions = COUNTROWS(FILTER('twitter_sentiment_results',
'twitter_sentiment_results'[sentiment] = 'twitter_sentiment_results'[predicted_sentiment]))
Accuracy % = DIVIDE([Correct Predictions], [Total Tweets], 0)
Positive Tweets = CALCULATE(COUNTROWS('twitter_sentiment_results'),
'twitter_sentiment_results'[predicted_sentiment] = "Positive")
```



Key Results:
• Total Tweets: 75K
• Accuracy: 73.79%
• Correct Predictions: 55K
• Positive, Negative, and Neutral distribution clearly visualized through Power BI.

Conclusion:
The dashboard effectively communicates model performance and sentiment distribution across different topics. It provides insights into which topics are viewed positively or negatively by users. Future work may include improving text preprocessing, using deep learning models (like BERT), and integrating live Twitter API data.

GitHub Repository: Brainwave_Matrix_Intern
LinkedIn Post: A short post with dashboard screenshot tagging Brainwave Matrix Solutions.

Thank You!