Reddit Project: Web API and NLP (Harry Potter and Marvel)

Mohona Yesmin


MARVEL


Harry Potter
AND THE PRISONER OF AZKABAN

01 - Introduction

Problem Statement

Identify the preferences of Harry Potter and Marvel fans on social media platforms to inform targeted advertising strategies for Halloween merchandise

Marketing companies seek to better understand the preferences of Harry Potter and Marvel fans on social media to optimize targeted Halloween merchandise ads. This understanding enables more effective advertising, leading to increased engagement and conversions for Halloween sales.

01 - Data Introduction

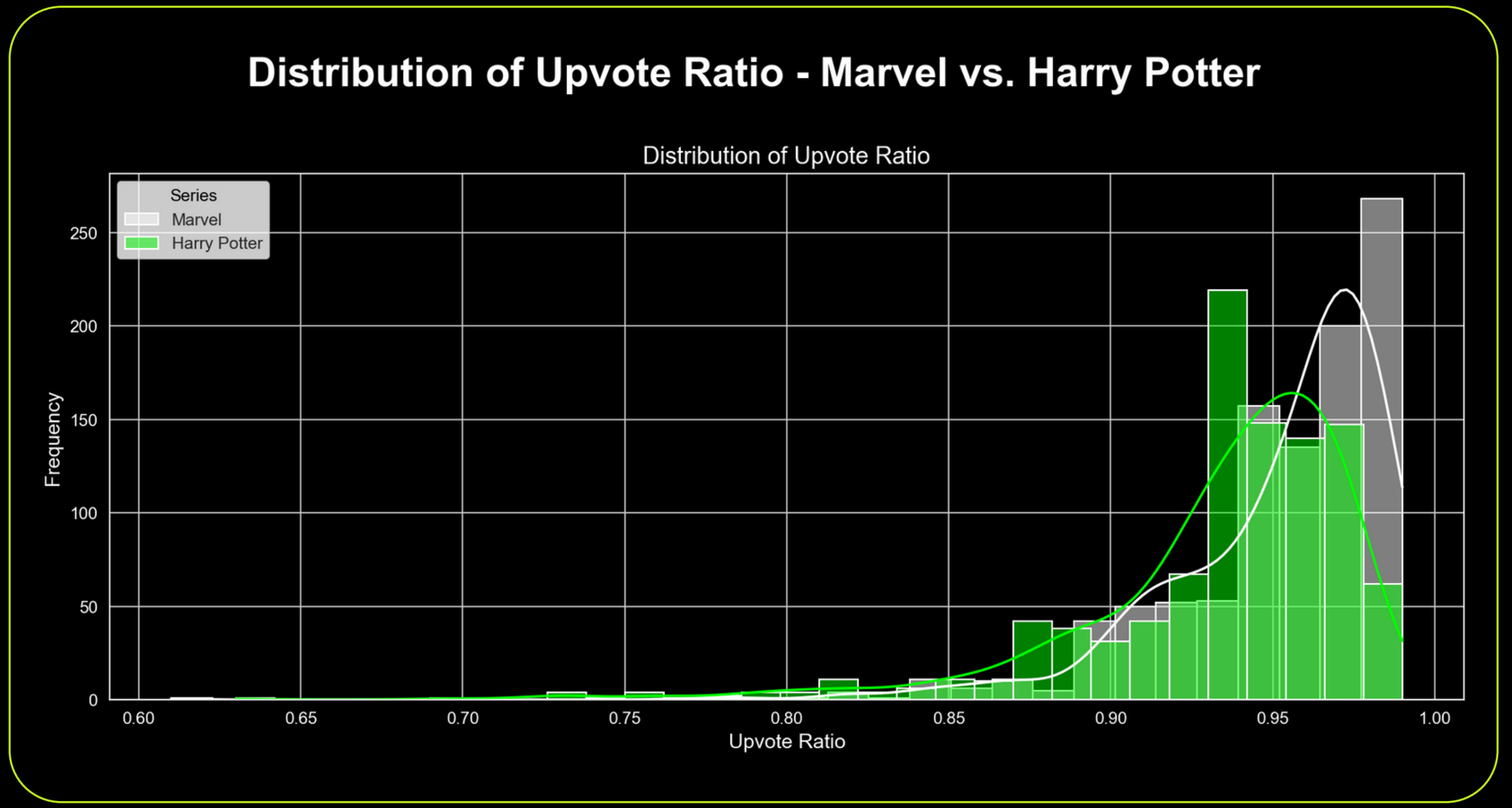
Data set

1. marvel.csv
2. harrypotter.csv

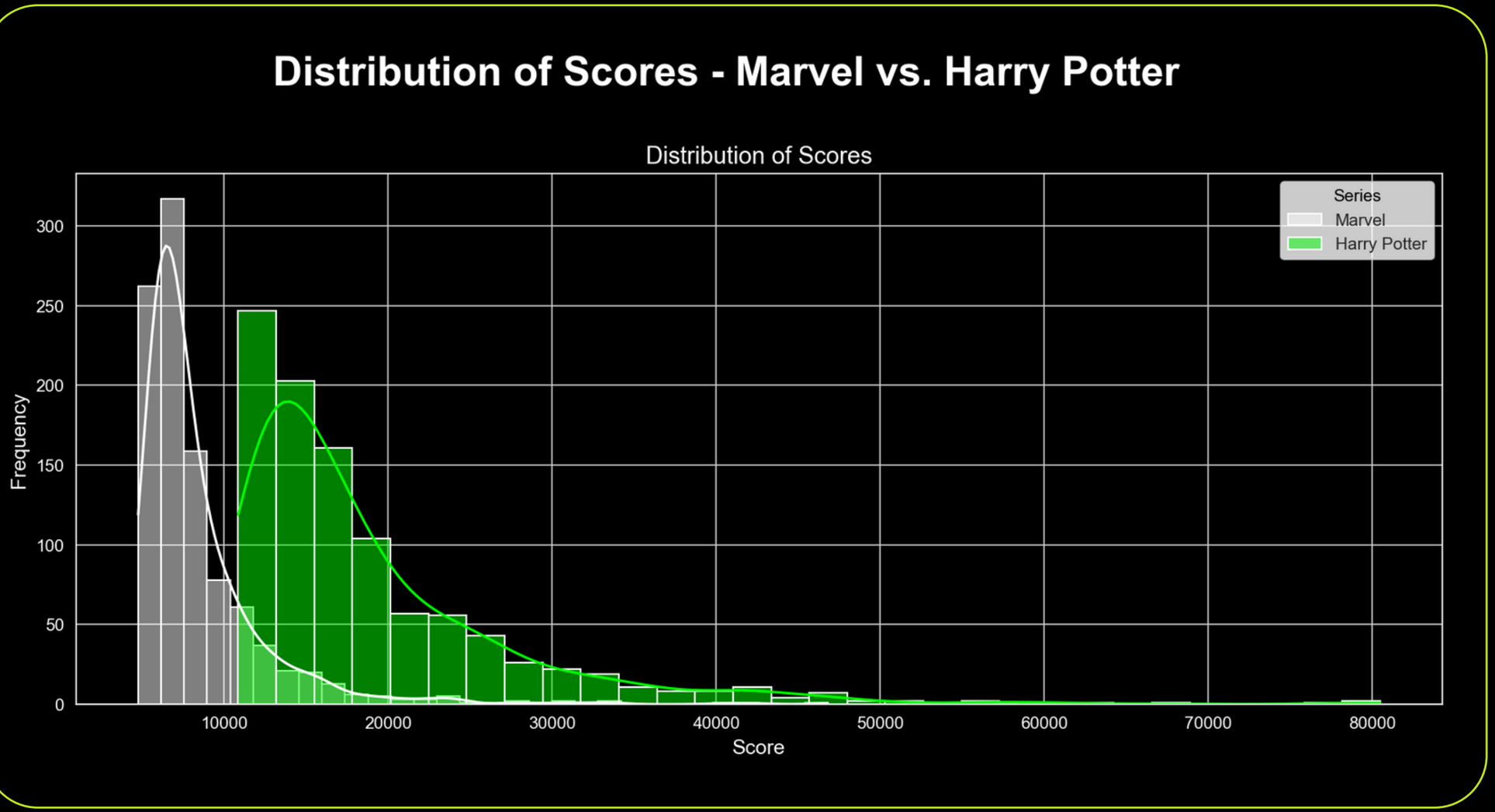
Data

1. 'id',
2. 'title',
3. 'content',
4. 'score',
5. 'num_comments',
6. 'author',
7. ‘created_utc',
8. 'upvote_ratio',
9. 'subreddit_flair',
10. 'submission_datetime',
11. 'post_type',
12. 'entity_recognition',
13. 'text_sentiment'

02 - Data Visualization

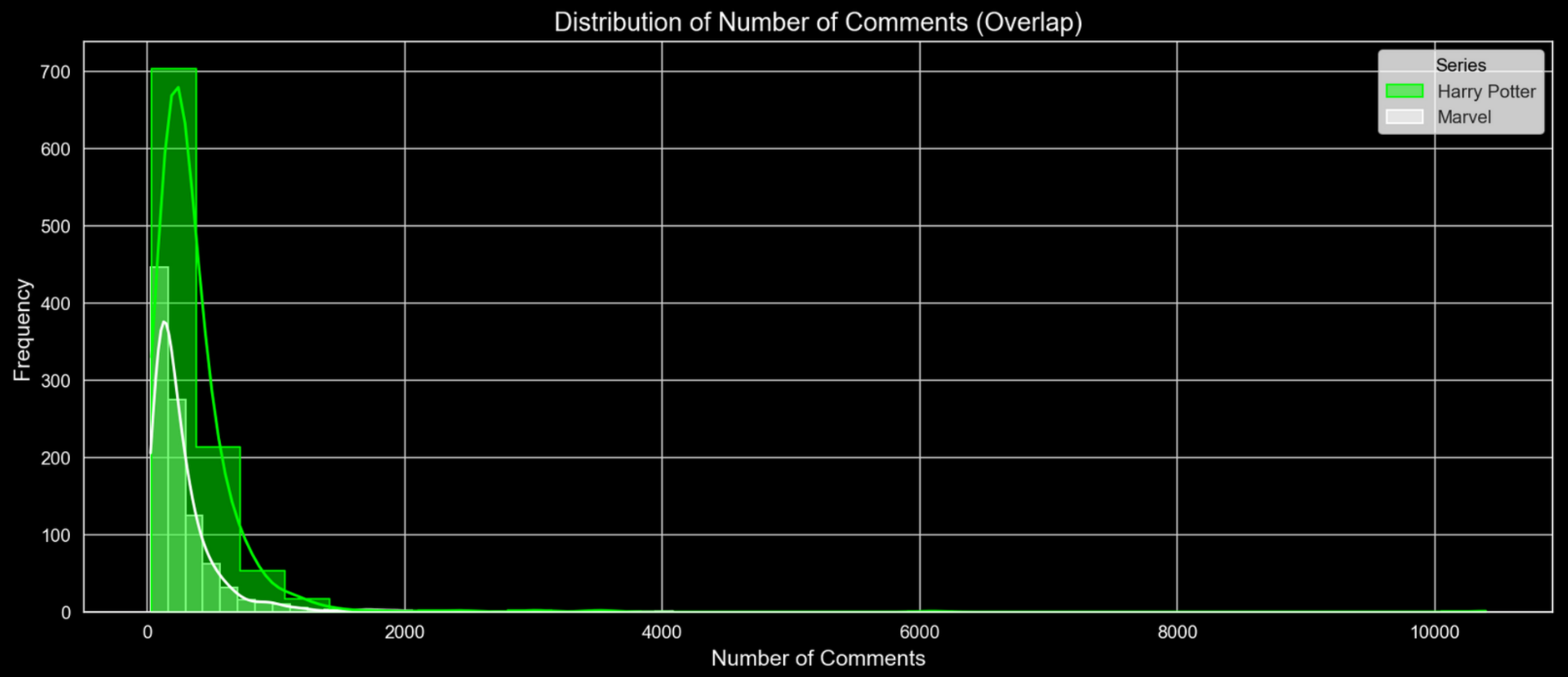


02 - Data Visualization

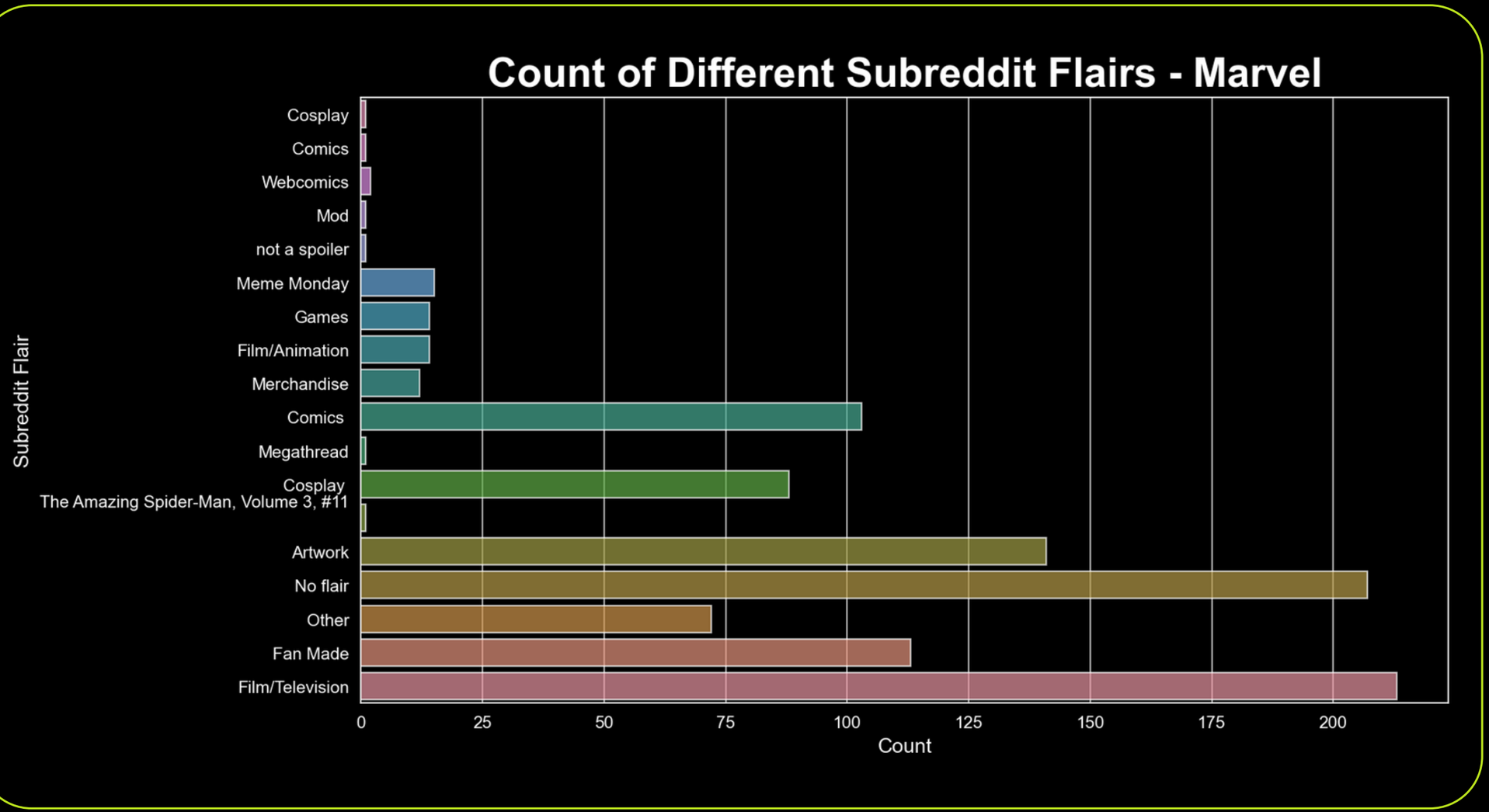


02 - Data Visualization

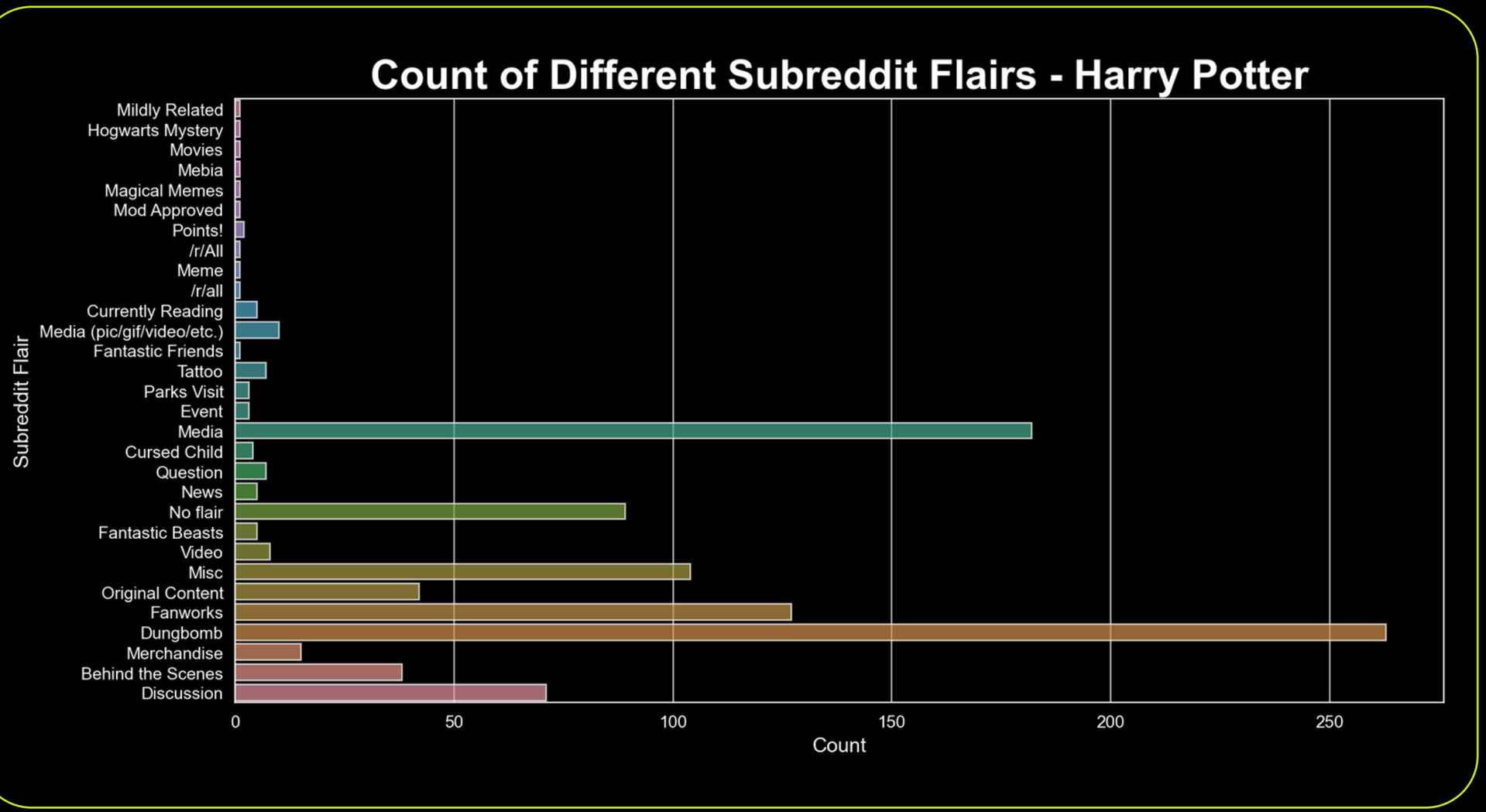
Distribution of Number of Comments - Marvel vs. Harry Potter



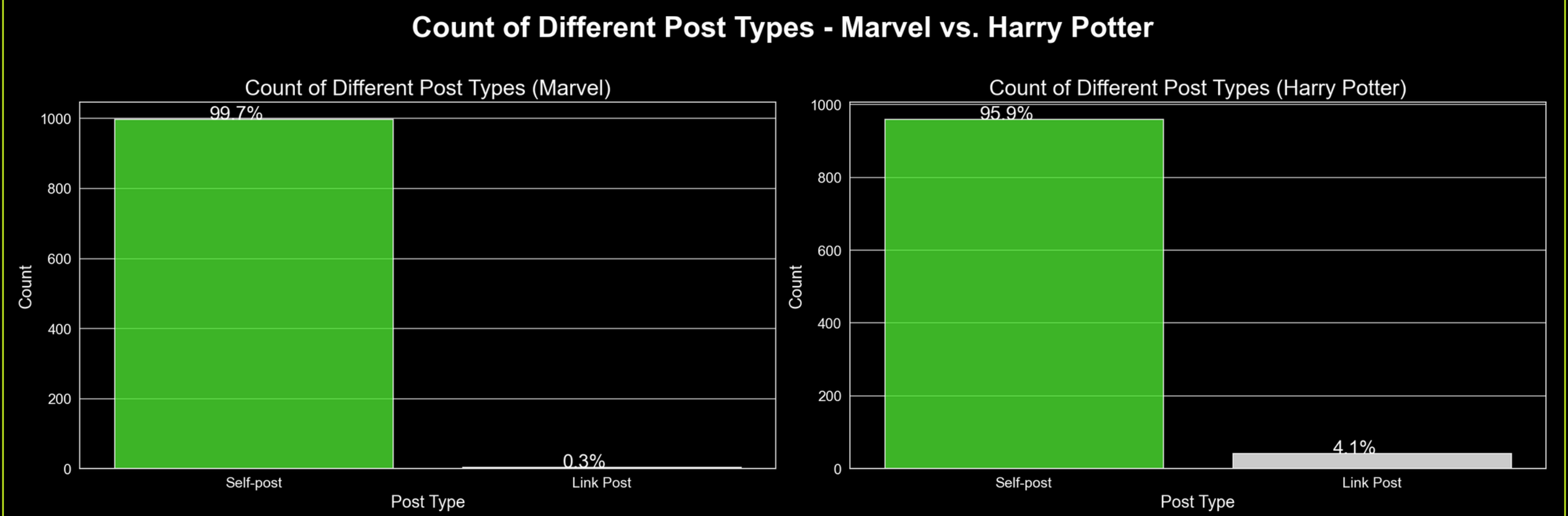
02 - Data Visualization



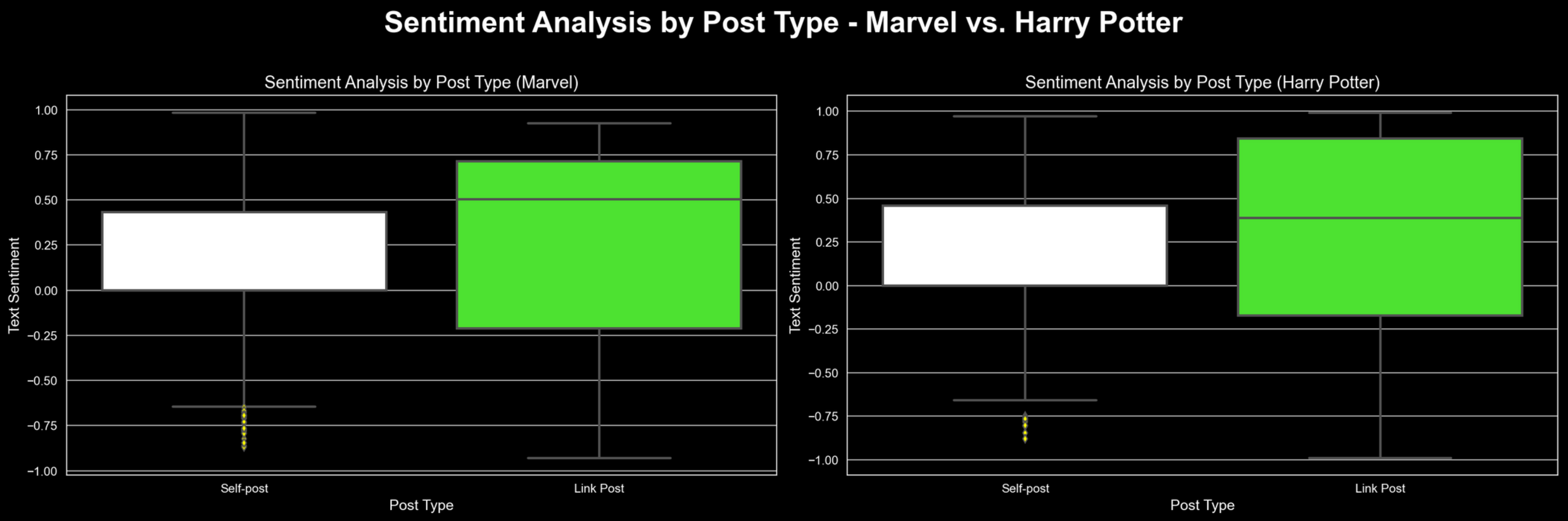
02 - Data Visualization



02 - Data Visualization



02 - Data Visualization



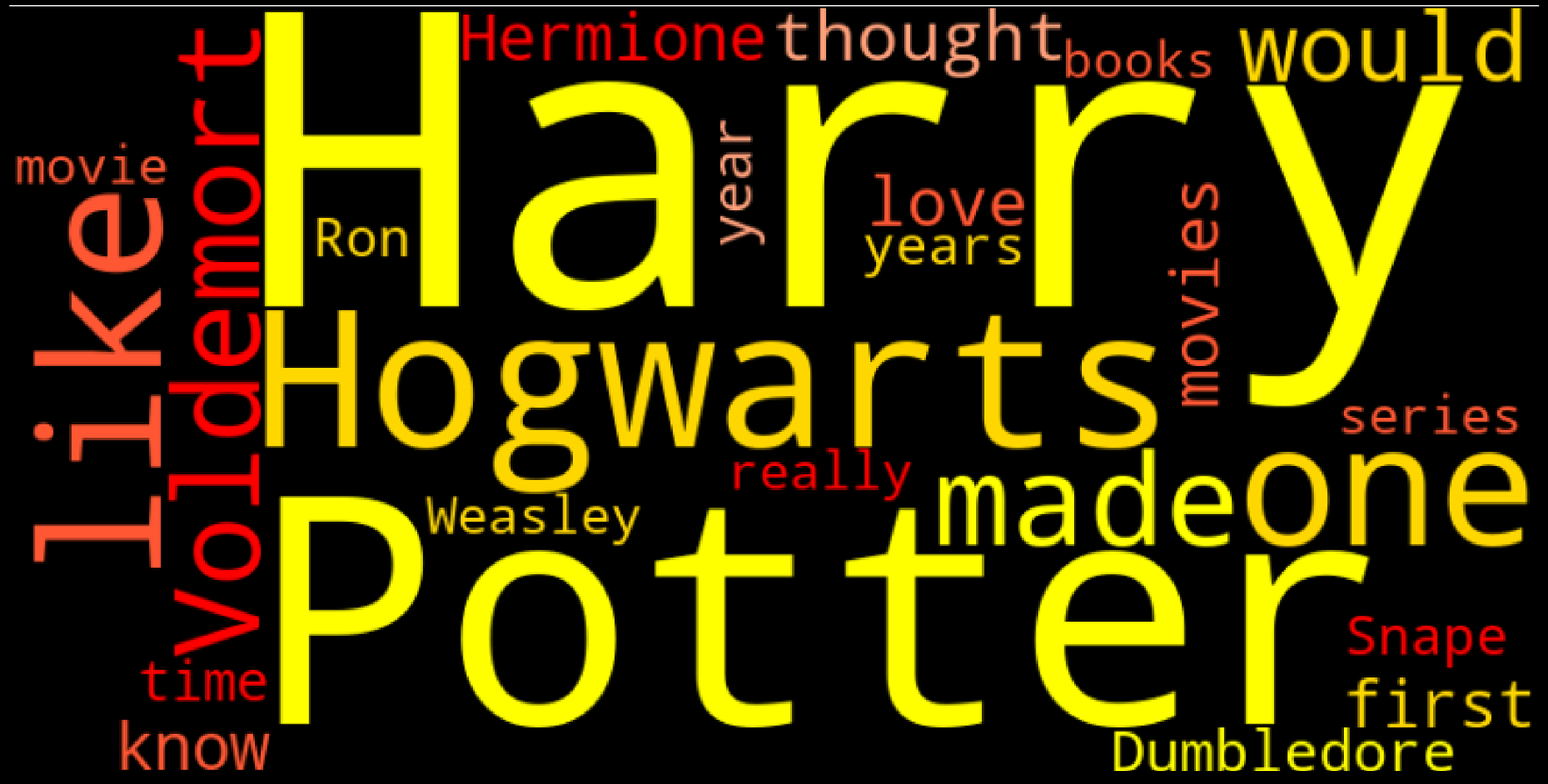
Common Words

Data Columns

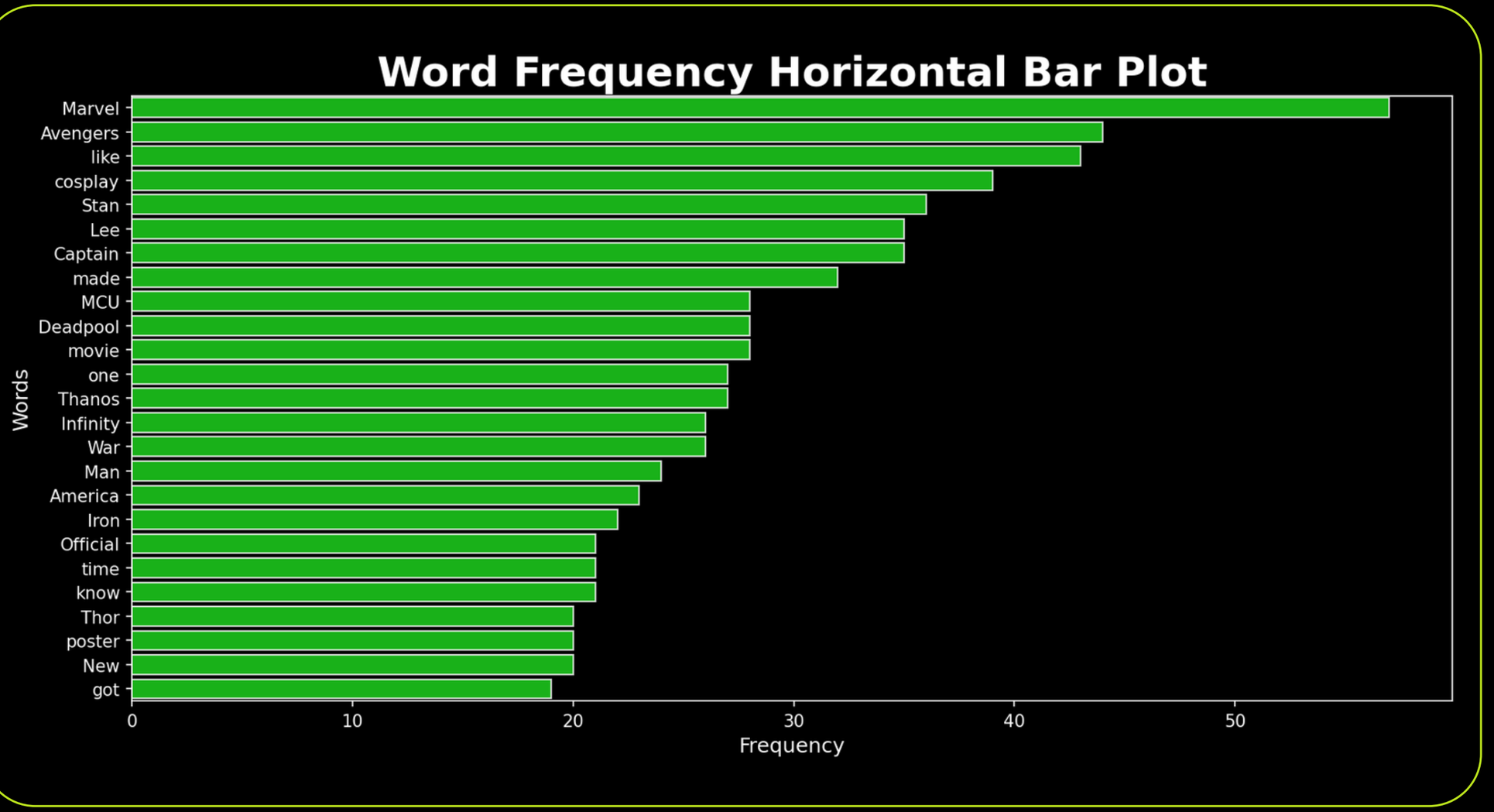
1. *Tittle*
2. *Content*

Harry Potter

Common Words in Title and Content



02 - Data Visualization



1. Marvel
2. Avengers
3. like
4. cosplay
5. Stan

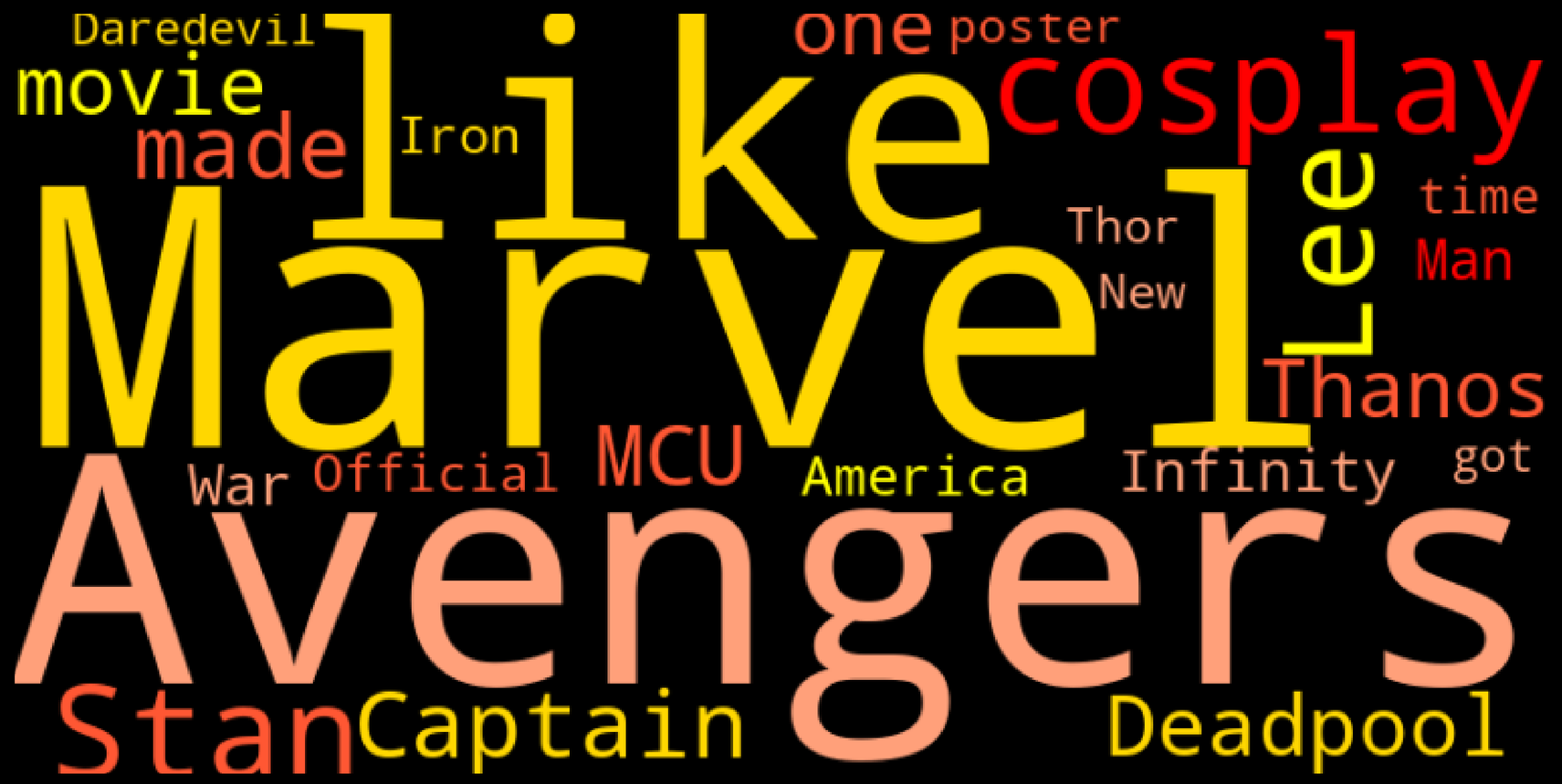
Common Words

Data Columns

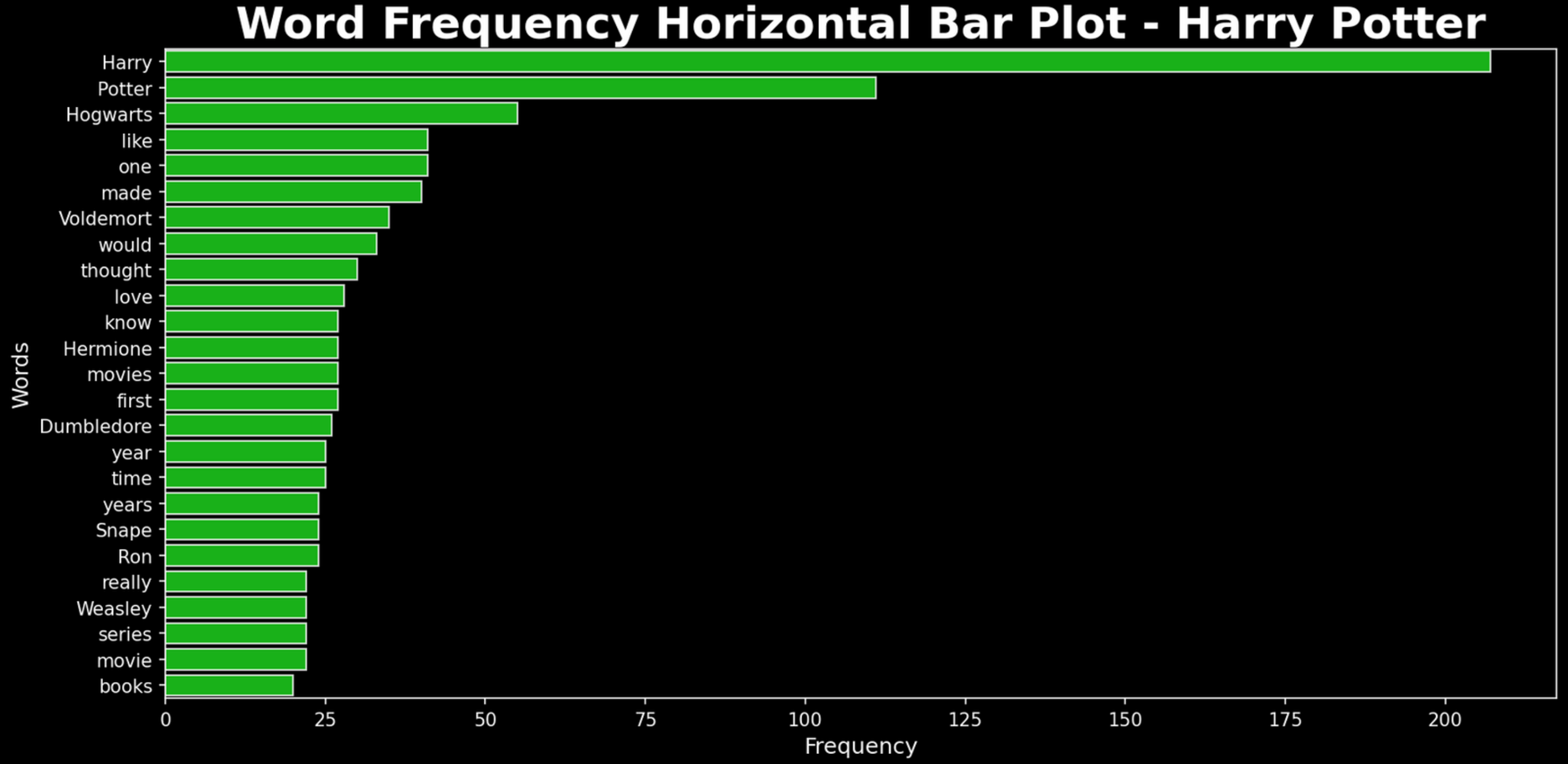
1. *Tittle*
2. *Content*

Marvel

Common Words in Tittle



02 - Data Visualization



1. Harry
2. Potter
3. Hogwarts
4. like
5. one

Logistic Regression Analysis

```
Cross-Validation Scores: [0.771875 0.80625  0.815625 0.815625 0.80625 ]
Mean CV Score: 0.803125
Training Score: 0.90875
Testing Score: 0.825
Accuracy: 0.825
              precision    recall  f1-score   support

Harry Potter       0.80      0.87      0.83       201
      Marvel       0.86      0.78      0.82       199

    accuracy                           0.82       400
   macro avg       0.83      0.82      0.82       400
weighted avg       0.83      0.82      0.82       400
```

Tips

Logistic Regression and TF-IDF model achieved 82.5% accuracy, demonstrating strong subreddit differentiation with balanced precision and recall, consistent cross-validation, and high training performance.

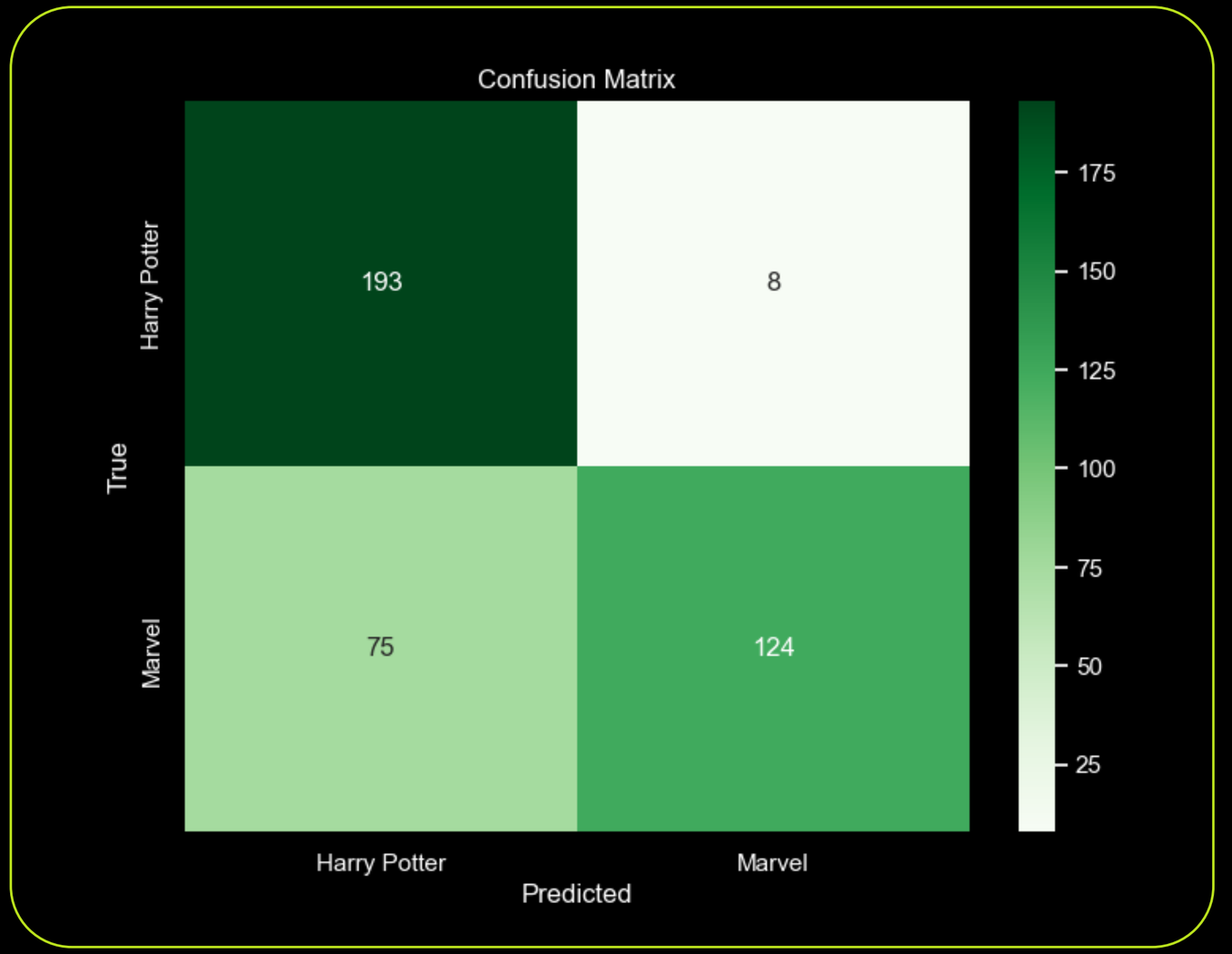
```
Accuracy: 0.8
              precision    recall  f1-score   support

Harry Potter       0.79      0.83      0.81       201
      Marvel       0.81      0.77      0.79       199

    accuracy                           0.80       400
   macro avg       0.80      0.80      0.80       400
weighted avg       0.80      0.80      0.80       400

Cross-Validation Scores: [0.8175 0.8125 0.84   0.8325 0.845 ]
Mean CV Score: 0.8295
Training Score: 0.94625
Testing Score: 0.8
```

Tips

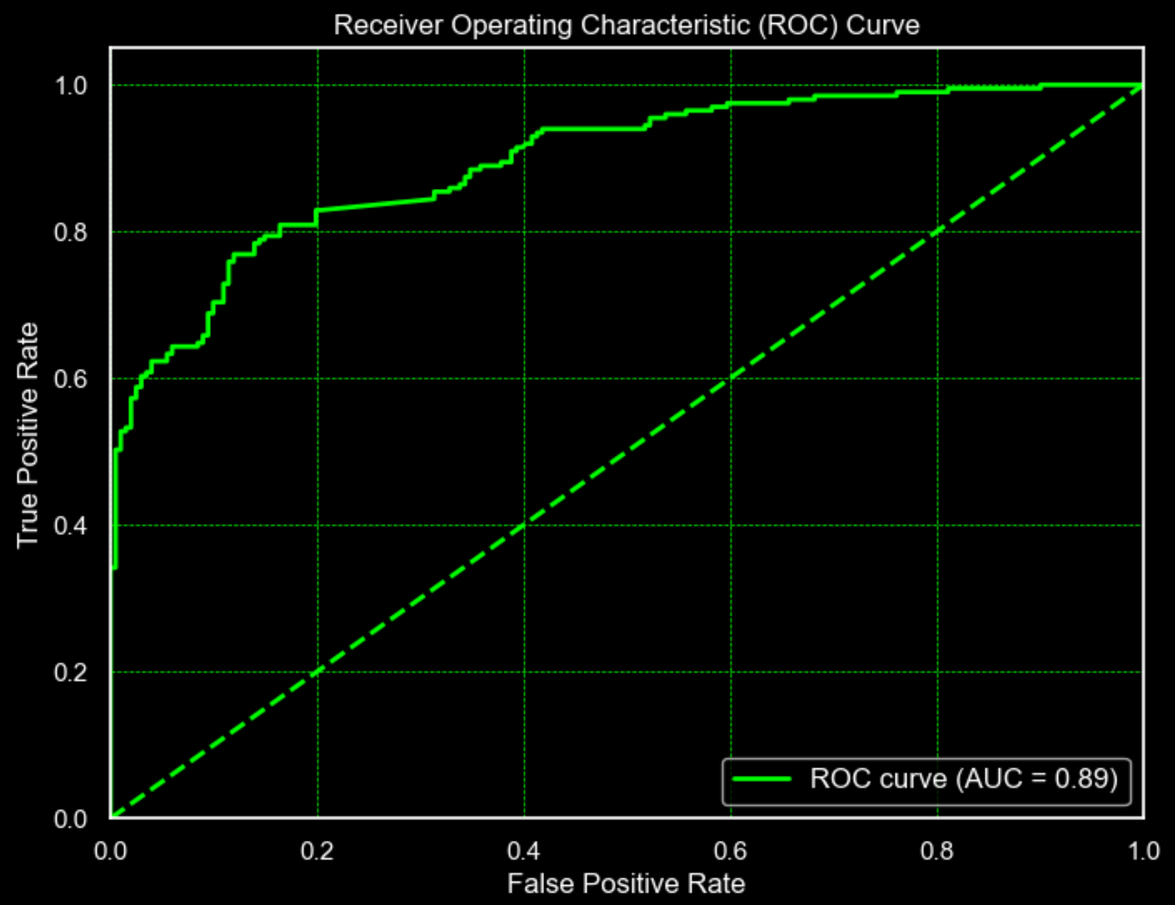
Naive Bayes and TF-IDF model achieved 80% accuracy, demonstrating strong subreddit differentiation with balanced precision and recall, consistent cross-validation, and high training performance.

Naive Bayes Analysis

Prediction


Confusion Matrix
Harry Potter
Marvel
True
193
8
75
124
Harry Potter
Marvel
Predicted
175
150
125
100
75
50
25

Predictions and Inference



ROC AUC 0.89

04 - Conclusions

1. ***Best Classifier Model: Logistic regression Analysis.***
    a. ***Tittle and Content***
2. ***TF-IDF Vectorization (Term Frequency-Inverse Document Frequency)***
3. ***CV = 0.80, Train = 0.91, Test = 0.825***
4. ***ROC AUC = 0.89***

Thanks