Data Science Toolbox

Improving Music Recommendations through User-Oriented Visualisation Techniques

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Introduction

- Digital music streaming platforms rapidly growing

- Increasing need for effective and personalized music recommendations

- **Challenges** : expanding music libraries, finding new and relevant tracks for users

Hypothesis

Null Hypothesis: Integration of user-oriented visualisation techniques with traditional recommendation algorithms using content-based algorithm will improve accuracy and personalization of music recommendations.

Alternative Hypothesis: There is no significant difference in the accuracy and personalization of music recommendations generated by content-based algorithm that combines user-oriented visualization techniques with traditional recommendation algorithms, compared to content-based algorithms.

Research Objectives

1. Investigate the effectiveness of integrating user-oriented visualisation techniques with traditional recommendation algorithms

2. Assess the accuracy and personalization improvements in the hybrid approach

3. Examine the compatibility of the developed recommendation engine with data visualisation

4. Evaluate user satisfaction and engagement with the enhanced music recommendation system

Research Question

1. How can user-oriented visualisation techniques be effectively integrated with traditional recommendation algorithms in a music recommendation system?
2. To what extent does the hybrid approach improve the accuracy and personalization of music recommendations compared to content-based alone?
3. How compatible is the developed recommendation engine with the data visualisation provided by the Tableau dashboard?
4. Does the enhanced music recommendation system lead to a more engaging and personalized music listening experience for users?

Methodology

- Create a dashboard using Tableau

- Visualise personal Spotify data

- Develop a recommendation engine to assess compatibility
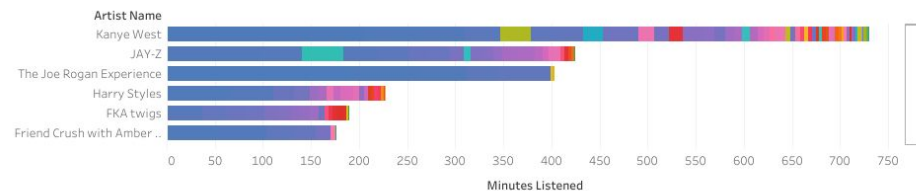
  with data visualisation

Methodology Overview

- Data Collection

- Data Preprocessing

- Visualization Development
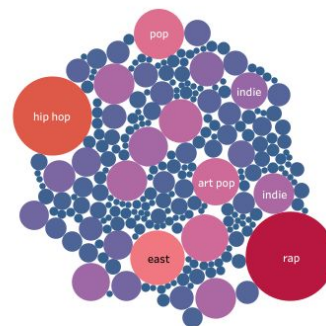
- Recommendation Engine Development
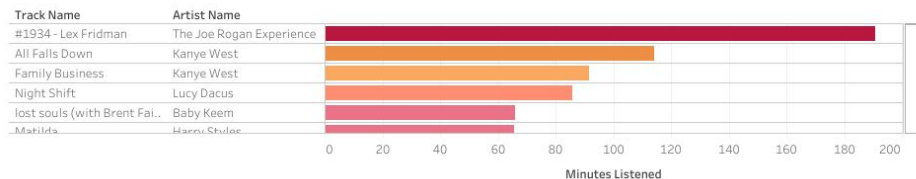
- Evaluation

Tableau Dashboard

Demonstration

Results

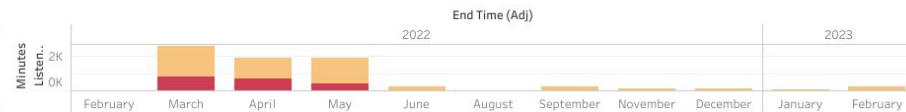|	Model	Accuracy	F1_Score
0	RandomForestClassifier	0.929062	0.815476
4	NaiveBayes	0.925629	0.823848
3	XGBClassifier	0.924485	0.801205
5	SGDClassifier	0.922197	0.793939
1	KNeighborsClassifier	0.914188	0.764890
2	DecisionTreeClassifier	0.902746	0.752187

Discussion

- **Results may not be generalizable to other datasets**

- **Did not evaluate the performance of the hybrid approach against pure content-based methods**

Conclusion

The integration of user-oriented visualisation techniques with traditional recommendation algorithms can improve the accuracy and personalization of music recommendations based on individual listening habits.

This study's findings provide strong evidence supporting this hypothesis, and the Random Forest and Naive Bayes classifiers demonstrated the highest accuracy and F1 scores. While the study has some limitations, this approach shows great potential for providing highly personalised and accurate music recommendations to users.

Thank you 🙏🙏