

Music Prediction and Recommendation using Machine learning Algorithms

Claudia Avittampilly¹,

¹(Information technology, ST Francis Institute of technology , Mumbai
Email: claudia.michael877@gmail.com)

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Abstract:

Music is a kind of content that has similar issues and challenges. Sales in digital music have been seen to increase significantly. Paid subscriptions and industry revenues from streaming have tripled between the years 2011 and 2014. The popularity of songs differ in this large market. Popularity of a particular song can be measured using the total sales or exposure to the public, and it is often summarized in a music chart. For instance, the Billboard charts determine the ranking of songs based on online streaming counts ,total sales etc. on a weekly basis. The information such as top tracks and artists from live radio plays are provided on the website Last.fm In our project, we are going to make a system for music prediction success to decide which music will be more hit than the other. Once we begin the project we will select the appropriate technology and framework. The framework that we will use for this system is the Flask and Tkinter Framework. We will use Advanced Data science and Machine Learning Algorithms. The aim of this paper is to give a unified modelling implementation of a music prediction and recommendation system.

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INTRODUCTION

Music trends undergo rapid changes in short periods. The success of any track released depends on various factors. Everyone likes to hear music and there are several applications based on music playlists and searching for music. There are not many applications for aspiring musicians based on predicting the type of music they might want to take up. The system has many functionalities like predicting genre , predicting mood, predicting popularity and recommending music to listeners based on their popularity. The listeners are mainly new aspiring musicians who are being guided by our system to help them predict what type of music they generally make and it also gives them a platform to post their music on the system. Thereafter, the music gets classified based on the genre and mood. The genre includes Hip-Hop, Pop, Jazz, Classical, Country, band/Rock, Reggae. The mood includes happiness , sadness, Anger, Calm, Energetic and Dreaminess. The system also provides a part for music composers to post their lyrics. Music Composers, Music Directors and Singers can easily collaborate with each other as we have implemented RDBMS too. The system also has a MBOX exe file which simply acts like a playlist for users. Users can also edit their profile including their profile image. There is also a Top rank chart known as Mboard for ranking artists according to their likes for music

MAJOR CHALLENGES IN THE DOMAIN

In our project, we are going to make a system for music prediction success to decide which music will be more hit than the other. We will use Machine learning Algorithms like Classification and Regression Trees . Once we begin the project we will select the appropriate technology and framework. The framework that we will use for this system is Flask Framework. We will first classify data based on the artists , the genre and the mood of the music. Then this data will be clustered and associated to know more similarities of the similar music that the users will like and the analytics of which music might go hit.

We will also compare music on the basis of the background music with different instruments. There are various attributes of music that we can be compared with and can be used to find the best within it. The dataset for music will be taken from data world million song dataset and github . We will also predict how the remix of the music could be and how high will it hit Keep your text and graphic files separate until after the text has been formatted and styled accordingly. Avoid the use of hard tabs, and limit the use of hard returns to only one return at the end of a paragraph. Never add any kind of pagination anywhere in the paper. The template will number the text heads so you don't have to .

A. MOTIVATION

Need of the project To help aspiring Musicians to grow in music by predicting the type of music they want. To create an automatic identification system for retrieval and recommendation of music information. To develop a system for music prediction and classify accordingly. To construct the recommendation model for music. To do better recording of music.

B. PROBLEM STATEMENT

To evaluate and compare data mining algorithms based on parameters. Advanced Data Science algorithms like Naive Bayes, Forest random trees, decision tree, CART, Logistic regression and ensemble algorithms can be used for data analytics in this project. For the collection of music datasets we do the survey for one or more fields ,and also take a reference from the UCI Repository System or github repository. By doing literature survey we will find out which Data Mining Association Algorithms are frequently used for the data set which we have selected. We will study the apriori and other classification algorithms.

METHODOLOGY

A. PROPOSED METHODOLOGY

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B. PROPOSED ALGORITHM

We will be using various machine learning algorithms and will compare them to find the better accuracy among them all. We will be comparing Decision Trees, Support Vector Machine and K-means clustering.

C. FEATURES OF THE PROPOSED SYSTEM

The system has many functionalities like predicting genre , predicting mood, predicting popularity and recommending music to listeners based on their popularity. The listeners are mainly new aspiring musicians who are being guided by our system to help them predict what type of music they generally make and it also gives them a platform to post their music on the system. The system will be built using Flask and SQLAlchemy.

IV. IMPLEMENTATION

The proposed system uses Machine learning Algorithms and Flask Framework to enhance the user experience for predicting music genre and mood and to recommend users based on popularity. Supervised machine learning builds a model that predicts based on evidence in the presence of uncertainty. A supervised learning algorithm takes a known set of input data and known responses to the data (output) and trains a model to generate reasonable predictions for the response to new data. Implementation involves the following steps:

Step 1: Data Gathering - First , the data is gathered. We downloaded the data from kaggle known as mood data for predicting mood and df1 for predicting genres. We have also used the online GTAN dataset for music clustering and ensembling algorithms and apply them on the data sets. To determine

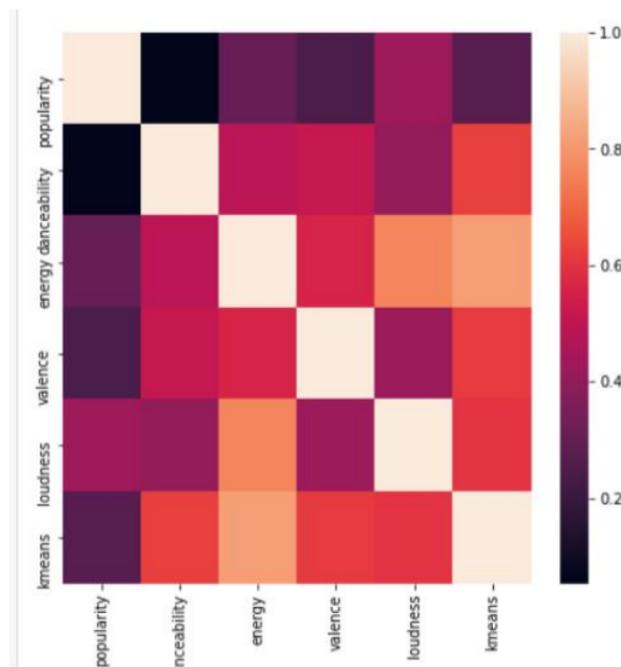
the best hit song of the year using data mining algorithms with more special features like the user can record his/her own music , describe sentiments about a specific music.

Step 2: Model Designing In this step , we loaded the datasets into a jupyter notebook for building the prediction model. Different Machine learning algorithms of classification and clustering were tried and the algorithm that got the best accuracy score was selected. For predicting mood and popularity, SVM gave 80 percent accuracy and for recommendation, K-means clustering gave better accuracy.

Step 3: Importing pickle files into website After we got the best predicted accuracy, the .ipynb file was converted to pickle file and .json for attribute names and we imported these files to a local website using Python Flask Framework and SQLAlchemy for database connectivity. We then created a GUI with Jinja template for inputting values and predicting mood, genre and popularity

V. DESIGN

7.1 Algorithms/Methods Used In this project, we have used various Data Mining Algorithms to classify data , predict and recommend music to users. Some of the algorithms used in the project are:
Algorithm 1: Support Vector Machine “Support Vector Machine” (SVM) is a supervised machine learning algorithm which can be used for both classification or regression challenges. However, the algorithm is mostly used in classification problems. In the SVM algorithm, we plot each data item as a point in n-dimensional space (where n is the number of features you have) with the value of each feature being the value of a particular coordinate. Then, we perform classification by finding the hyper-plane that differentiates the two classes very well.



VI. CONCLUSION

In the project, we successfully implemented a prediction system that predicts the genre of the music, mood of the music and popularity of the music. We also successfully created the Top chart ranking list and performed Classification through Uploading songs and posting Lyrics. We also created a commendation system that recommends music that is popular with a limit of 100. We also recommend music of famous artists that were in the data set. Through the project, we learned to create templates in Flask and also use SQLAlchemy with Flask. We successfully generated the pickle files and models and integrated them in the project template in flask. In the project we successfully implemented an uploading system for music for artists and lyrics for music composers that will be saved in the database and be retrieved in the timeline and classification tab. We also created a recording system where the user can record his/her music and can download and upload the music too. The music gets classified according to the genre and mood provided. We have also created a social media handle where the Music Composers and Artists and Directors can collaborate with each other and check each other's posts.

VI. ACKNOWLEDGMENT

The success and final outcome of this project required a lot of guidance, assistance and supervision of Ms. Monika Pal. I would like to express our deep appreciation to her for the same. I am thankful and fortunate enough to get constant encouragement and support from Dr. Joanne Games, HOD INFT and the Director and Principal of ST Francis Institute of technology.

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