IDS 702 - Final Project Proposal
Pranav Manjunath

Title: Prediction of Genre based on Song Characteristics/Features

Objective: The objective of this project is to create an R Shiny Application based on a statistical model that can accurately predict a song's genre based on its musical features and characteristics.

Background: Many musicians incorporate multiple elements of various genres into their music. While composing and creating, there would not have a clear idea as to what genre their music belongs to. Hence this project aims to accurately predict the song's genre by using it's musical characteristics.

Scope: This project will be mainly used by musicians who compose music. The scope of the project would be building an appropriate model that can classify and predict song genres. The next step would be building an R Shiny application where musicians can input their song characteristics and the application would predict the respective genre of the song.

Major Research Questions:

1. What are the most important musical features that impact the genre of a song?
2. Which model would produce better results in predicting the genre of a song?

Data:
The dataset that will be used for this project is taken from Kaggle and consists of 131562 rows (songs) and 15 musical features. There are 2800 Genres present in the dataset. Except for the genre, there are no factor variables present in the data. There are no missing values present in the data. Grouping of similar genres must be done.

Questions to answer when working with the data:

1. How to combine and group genres together?
2. What is the minimum number of songs a genre should have?

Variable	Description
Name	Song Name
Danceability	Danceability describes how suitable a track is for dancing based on a combination of musical elements including tempo, rhythm stability, beat strength, and overall regularity.
Energy	Energy is a measure from 0.0 to 1.0 and represents a perceptual measure of intensity and activity.
Key	The estimated overall key of the track.
Loudness	The overall loudness of a track in decibels (dB).
Mode	Mode indicates the modality (major or minor) of a track.
Speechness	Speechiness detects the presence of spoken words in a track.
Acousticness	A confidence measure from 0.0 to 1.0 of whether the track is acoustic.
Instrumentalness	Predicts whether a track contains no vocals.
Liveness	Detects the presence of an audience in the recording.
Valence	A measure from 0.0 to 1.0 describing the musical positiveness conveyed by a track.
Tempo	The overall estimated tempo of a track in beats per minute (BPM).
Duration_ms	The duration of the track in milliseconds.
time_signature	An estimated overall time signature of a track.
Genre	Genre of the Song

Data Columns

Project Plan:
As the response variable (Genre) is a multiclass factor variable, I will use Multinomial Logistic Regression to build a classifier. I would also plan to use a neural network and compare the results of both models.

Timeline:
Week1 (Oct 18th - Oct 24th): EDA and Understanding the Data
Week2 (Oct 25th - Oct 31st): Model implementation and Assessment
Week3 (Nov 1st - Nov 7th): Model implementation and Assessment
Week4 (Nov 8th – Nov 14th): Working on Front End and Report Writing