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Final Capstone Project for Flatiron Data Science Bootcamp

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Flatiron - Capstone Project by Vi Bui

DISCO DUO

Building Deep Nueral Networks using music data and Tensorflow to predict metrics such as danceability



Overview

Client: Existing or new music streaming services. Existing: Spotify, Pandora, Amazon Music, etc. New: companies interested in building new platforms to connect people through music.

Objective: Create a platform where listeners of the same song are connected and able to discover new songs through their “connector song” by requesting another song based on a musical metric such as: danceability, loudness, acousticness, valence, etc.

Data, Methodology, and Models

Data source: Spotify

1. Spotify Song Data - <https://www.kaggle.com/akiboy96/spotify-dataset>
2. Spotify Genre Data - https://www.kaggle.com/code/akiboy96/spotify-song-popularity-genre-exploration/data?select=genre_music.csv

Methodology: Pull sample from data; create spectrogram images for songs; train model to predict danceability

Models: Sequential Models (Keras)

1. Layers
2. Stochastic
3. Add layers

Target for first model: danceability

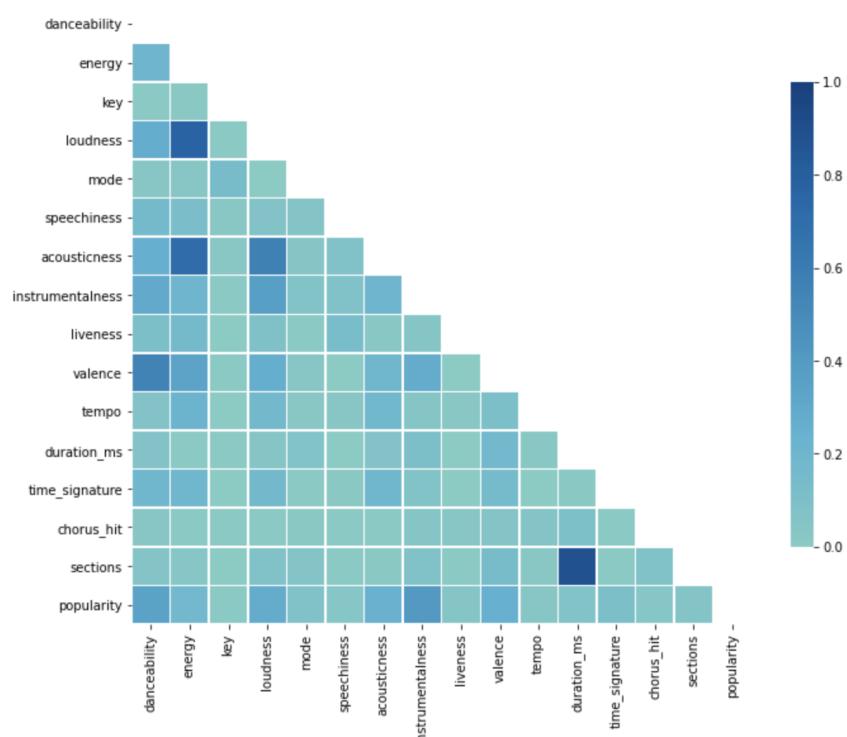
Danceability: A value of 0.0 is least danceable and 1.0 is most danceable. Danceability describes how suitable a track is for dancing based on a combination of musical elements including tempo, rhythm stability, beat strength, and overall regularity.

BUSINESS VALUE

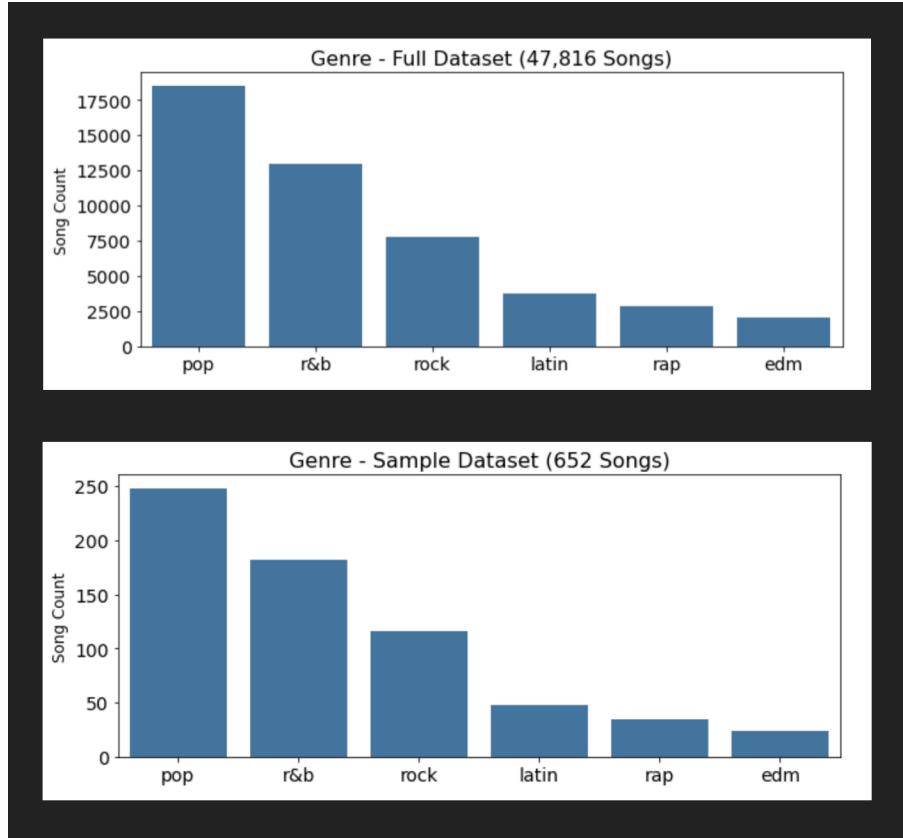
Connect people through music in a new way // connect people in a new way through music

OBSERVATIONS ABOUT THE DATA

Danceability is most strongly correlated with valence (happiness), popularity, loudness, and energy

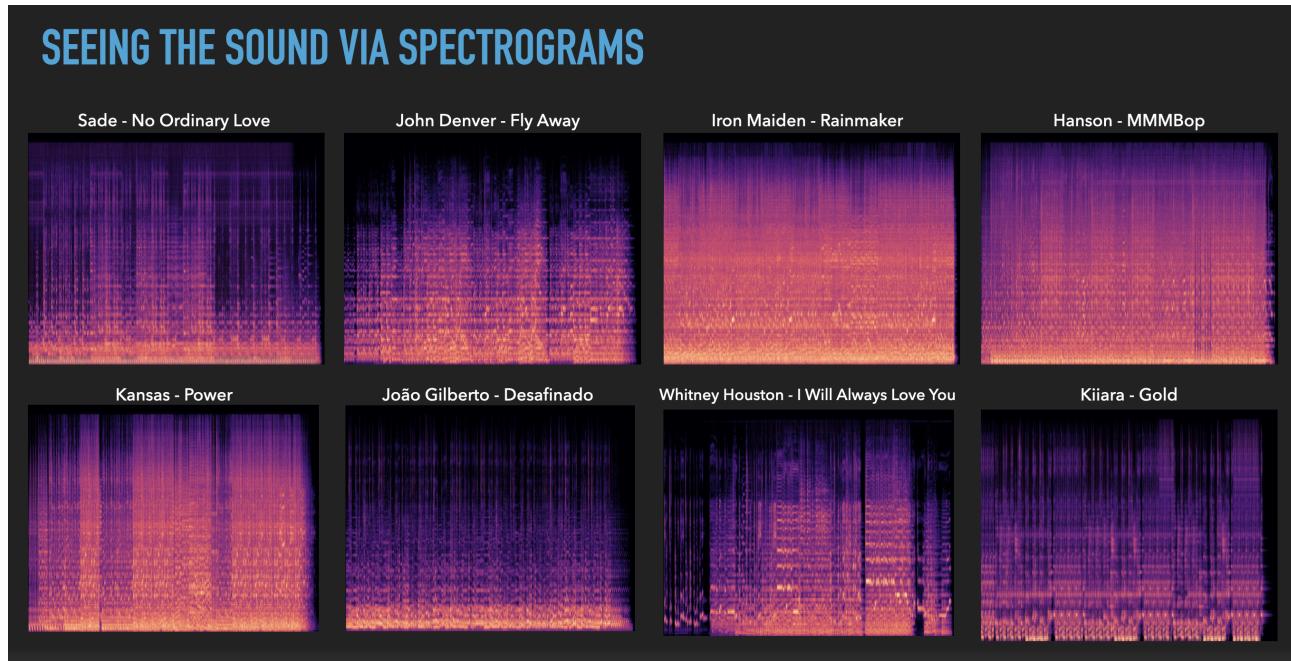


Sample dataset has similar genre distribution as full dataset



Methodology

Spectrograms were used as images to model the data



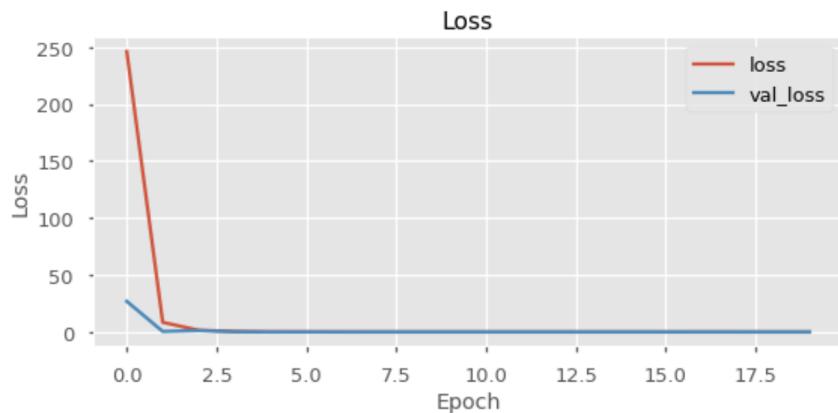
Models & Metrics

We ran three models and used MSE (mean squared error) as our performance metric. The loss function (Mean Squared Error) is used to indicate how far our predictions deviate from the target values.

While all models showed strong results and predictions, we chose Model 3 as our Final Model. Our final model's MSE (Mean Squared Error) shows it will be a strong predictor of "danceability" of songs

Final Model MSE:

- loss (MSE): 0.0191
- val_loss: 0.0183 (validation MSE)



RESULTS & RECOMMENDATIONS

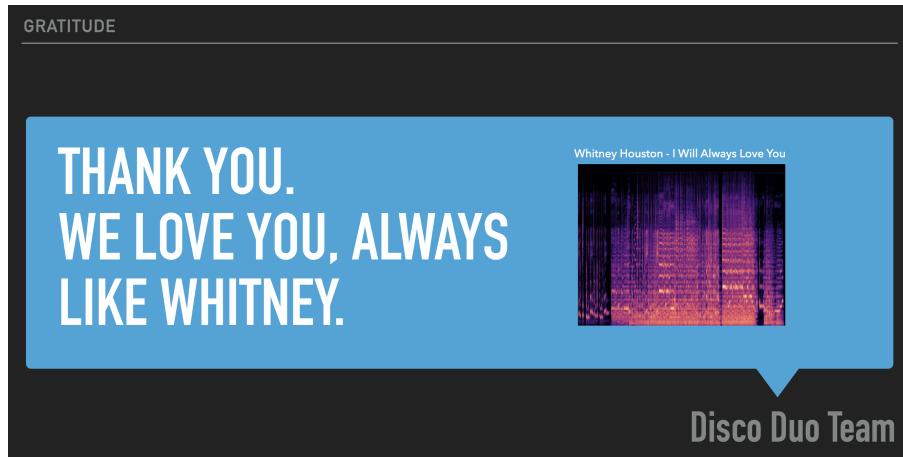
Summary of recommendations

- All three Sequential Models performed well, and we feel most confident with Model 3
- With Model 3's MSE (mean squared error) = loss: 0.0191 & val_loss: 0.0183, our model shows it will be a strong predictor of "danceability" of songs
- We will use the same approach in our Future Work with other metrics in the dataset

FUTURE WORK

- Run models for all remaining metrics:
 1. Energy
 2. Speechiness
 3. Acousticness
 4. Instrumentalness
 5. Liveness
 6. Valence
- Build platform to connect users listening to the same song and apply Disco Duo
- Expand ways to use Disco Duo (disco dates, silent disco games, etc.)

THANK YOU!!



Repository Structure

- Images
- .gitignore
- README.me
- Vi_Bui_Capstone_Presentation.key
- Vi_Bui_Capstone_Presentation.pdf
- Vi_Bui_Capstone_Submission_Jupyter Notebook.pdf
- Vi_Bui_Capstone_Submission.ipynb
- viiiiiiiii_Flatiron_Capstone_Final_Vi_Bui.pdf

Releases

No releases published

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Packages

No packages published

[Publish your first package](#)

Languages

 **Jupyter Notebook** 100.0%