WORKOUT PLAYLIST GENERATOR

-Edition

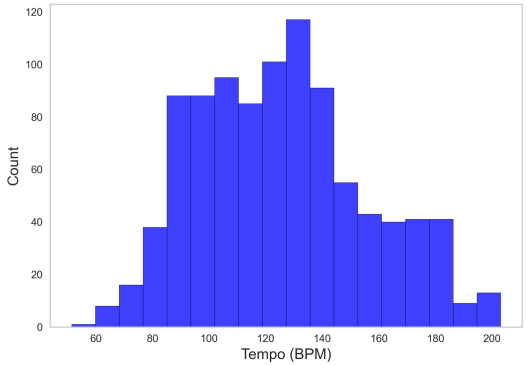
PROJECT OVERVIEW

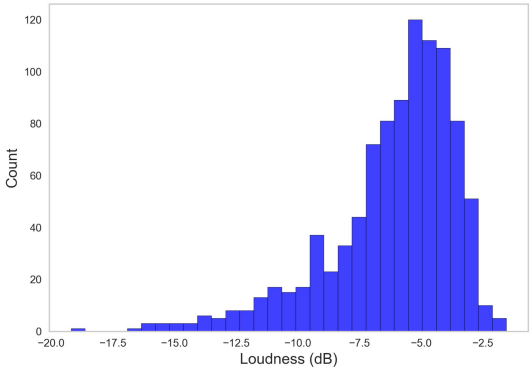
- We all know the problem of running out of new songs for your workout or gym visit…
- What if you could enter a song you love with the right energy for your workout, and you would get a playlist curated to your taste?
- We used Spotify API’s audio features to create a song recommendation app that generates a playlist based on your song input!

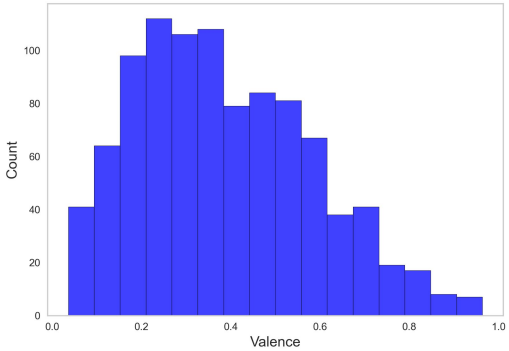
SOURCES & DATA

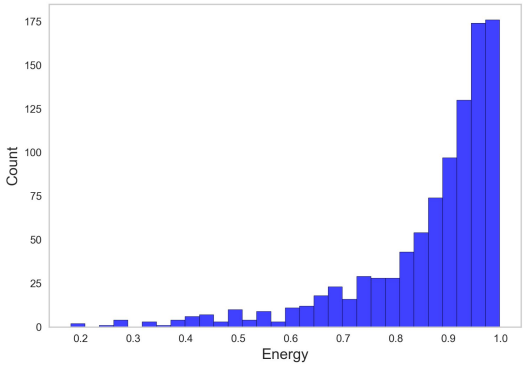
- We used Spotify's API to download a large and varied selection of Heavy Metal Songs
  - **Started from a Spotify-curated Metal Essentials Playlist (100 Songs)**
  - **Used Spotify API's related artists endpoint to find the top related bands to each artist from that playlist**
  - **Gathered the top 5 songs of each artist using Spotify's popularity index**
- After removing duplicates we had about 1000 Songs
- Downloaded the audio features for each Song (containing information about the tempo, energy, loudness, mood etc.)

AUDIO FEATURES







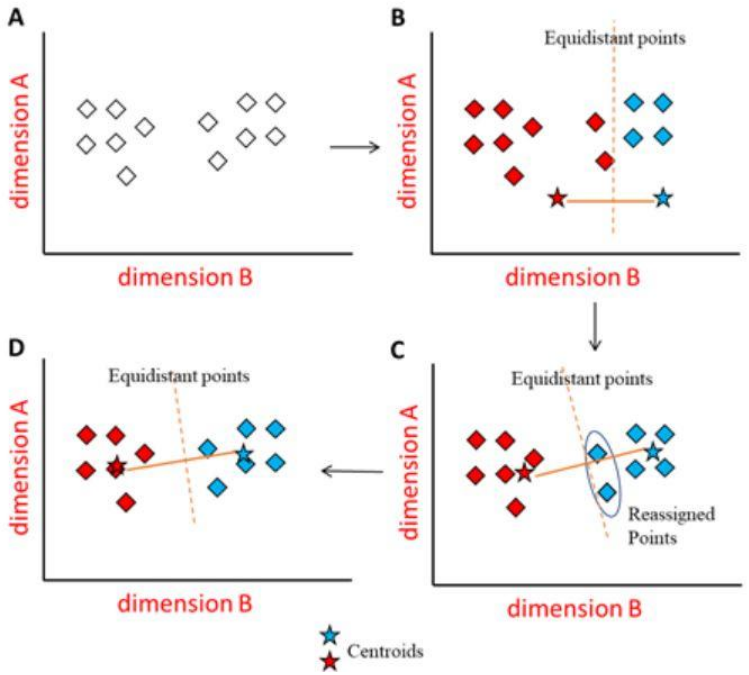


We removed non-relevant audio features and narrowed it down to:

- Tempo
- Loudness
- Valence
- Energy

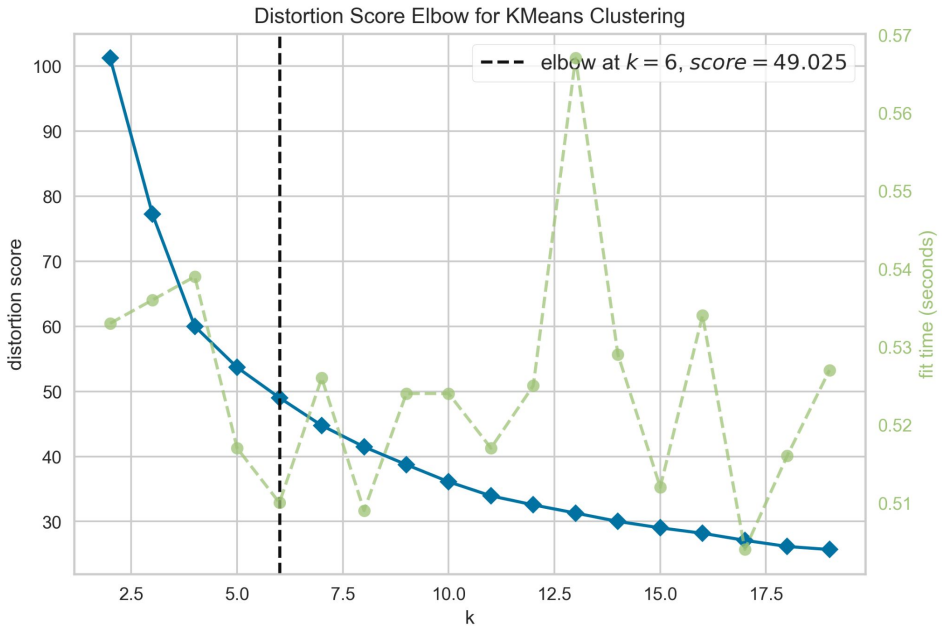
SONG CLUSTERING

After MinMax-Scaling we used KMeans clustering to separate the songs into meaningful clusters



SONG CLUSTERING

Distortion score Elbow suggested 6 clusters but going by domain knowledge that would not be enough to reflect all the different flavors

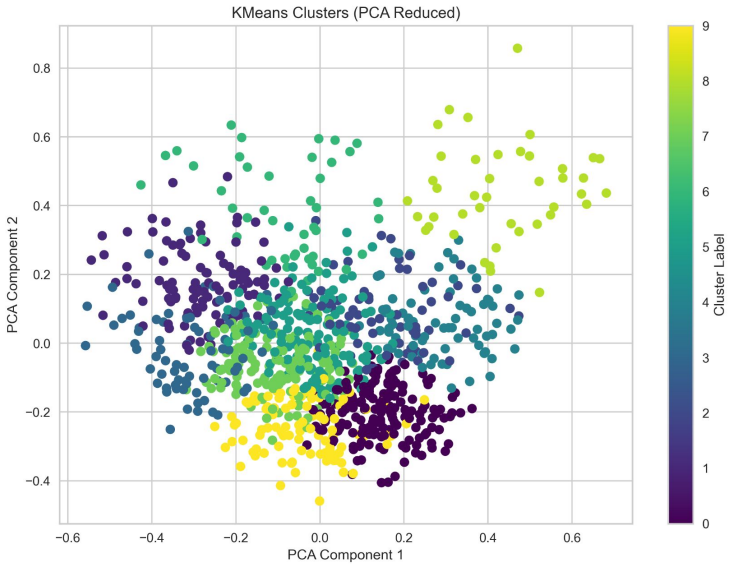


SONG CLUSTERING

- After a lot of finetuning the most satisfying separation and diversity was reached with 10 clusters and 4 features for KMeans Clustering
- Unfortunately the highest Silhouette Score we reached was ~0.242 as Heavy Metal music is not easily separable by the features provided by Spotify
- Different clustering methods like DBSCAN or Gaussian Mixture Models did not yield better results

SONG CLUSTERING VISUALISATION

PCA



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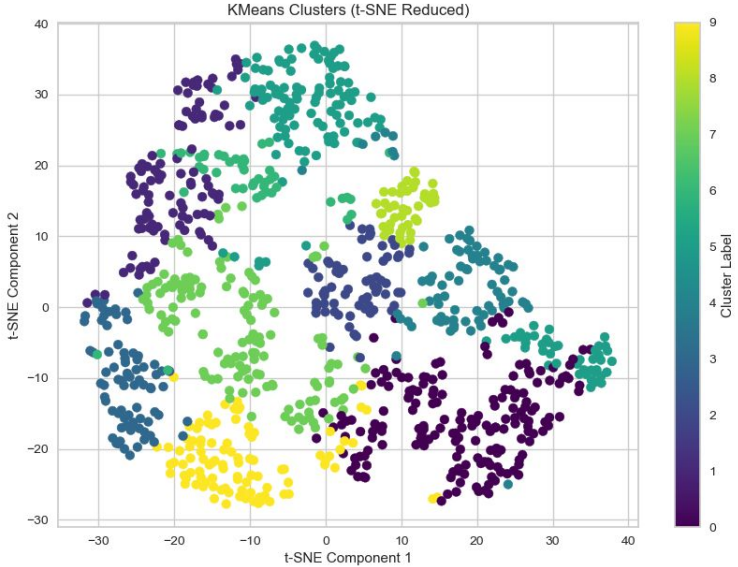

STREAMLIT WEB APP

—> Streamlit Demonstration

CONCLUSION & OUTLOOK

- A larger dataset could improve clustering
- Additional factors like genre tags could be used to enhance separation
- Implement more genres to get an app for any taste!


THANK YOU!
Henning Claussen