- Spotify API & Indicators:

Charts must also be presented on a “Spotify” tab

Data source:

- The user must have the option to connect with API from the following platform: Spotify
  https://developer.spotify.com/documentation/web-api/reference/

- (Remember the OAuth permission token to call the API)

Output needed from API

1. User Saved Tracks:
   (https://developer.spotify.com/documentation/web-api/reference/library/get-users-saved-tracks/)

KEY	VALUE TYPE	VALUE DESCRIPTION
added_at	a timestamp	The date and time the track was saved.
track	a track object	Information about the track.

1.1 Timestamp
1.2 Audio features
(https://developer.spotify.com/documentation/web-api/reference/object-model/#context-object)

- Danceability

danceability	float	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. A value of 0.0 is least danceable and 1.0 is most danceable.

- Energy

energy	float	Energy is a measure from 0.0 to 1.0 and represents a perceptual measure of intensity and activity. Typically, energetic tracks feel fast, loud, and noisy. For example, death metal has high energy, while a Bach prelude scores low on the scale. Perceptual features contributing to this attribute include dynamic range, perceived loudness, timbre, onset rate, and general entropy.

- Instrumentalness

instrumentalness	float	Predicts whether a track contains no vocals. “Ooh” and “aah” sounds are treated as instrumental in this context. Rap or spoken word tracks are clearly “vocal”. The closer the instrumentalness value is to 1.0, the greater likelihood the track contains no vocal content. Values above 0.5 are intended to represent instrumental tracks, but confidence is higher as the value approaches 1.0.

- Liveness

liveness	float	Detects the presence of an audience in the recording. Higher liveness values represent an increased probability that the track was performed live. A value above 0.8 provides strong likelihood that the track is live.

- Acousticness

acousticness	float	A confidence measure from 0.0 to 1.0 of whether the track is acoustic. 1.0 represents high confidence the track is acoustic.

1.3 Popularity from track object: (saved tracks)
https://developer.spotify.com/documentation/web-api/reference/object-model/#context-object

popularity	integer	The popularity of the track. The value will be between 0 and 100, with 100 being the most popular. The popularity of a track is a value between 0 and 100, with 100 being the most popular. The popularity is calculated by algorithm and is based, in the most part, on the total number of plays the track has had and how recent those plays are. Generally speaking, songs that are being played a lot now will have a higher popularity than songs that were played a lot in the past. Duplicate tracks (e.g. the same track from a single and an album) are rated independently. Artist and album popularity is derived mathematically from track popularity. Note that the popularity value may lag actual popularity by a few days: the value is not updated in real time.

1.4 Genre
https://developer.spotify.com/documentation/web-api/reference/object-model/#artist-object-simplified

genres	array of strings	A list of the genres the artist is associated with. For example: `"Prog Rock"` , `"Post-Grunge"`. (If not yet classified, the array is empty.)

2. Played tracks (https://developer.spotify.com/documentation/web-api/reference/player/get-recently-played/)

2.1 Audio features (https://developer.spotify.com/documentation/web-api/reference/object-model/#context-object)

- Danceability
- Energy
- Instrumentalness
- Liveness
- Acousticness

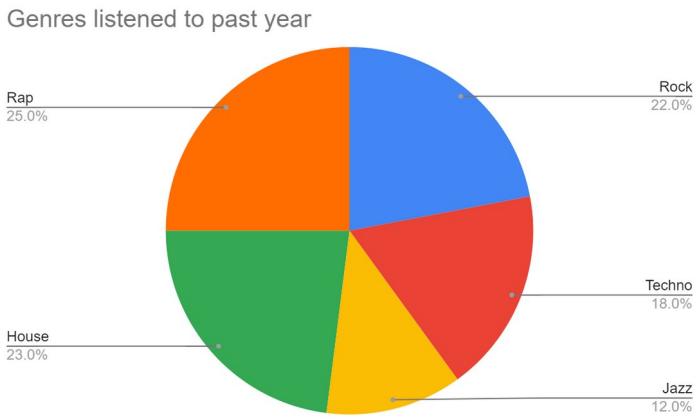
Charts to be visualised: 4 indicators

- Indicator 1: Genre over time

Track object > Artist object (full) > Genres

Count Total Saved Tracks in the previous year

Count total of each genre saved

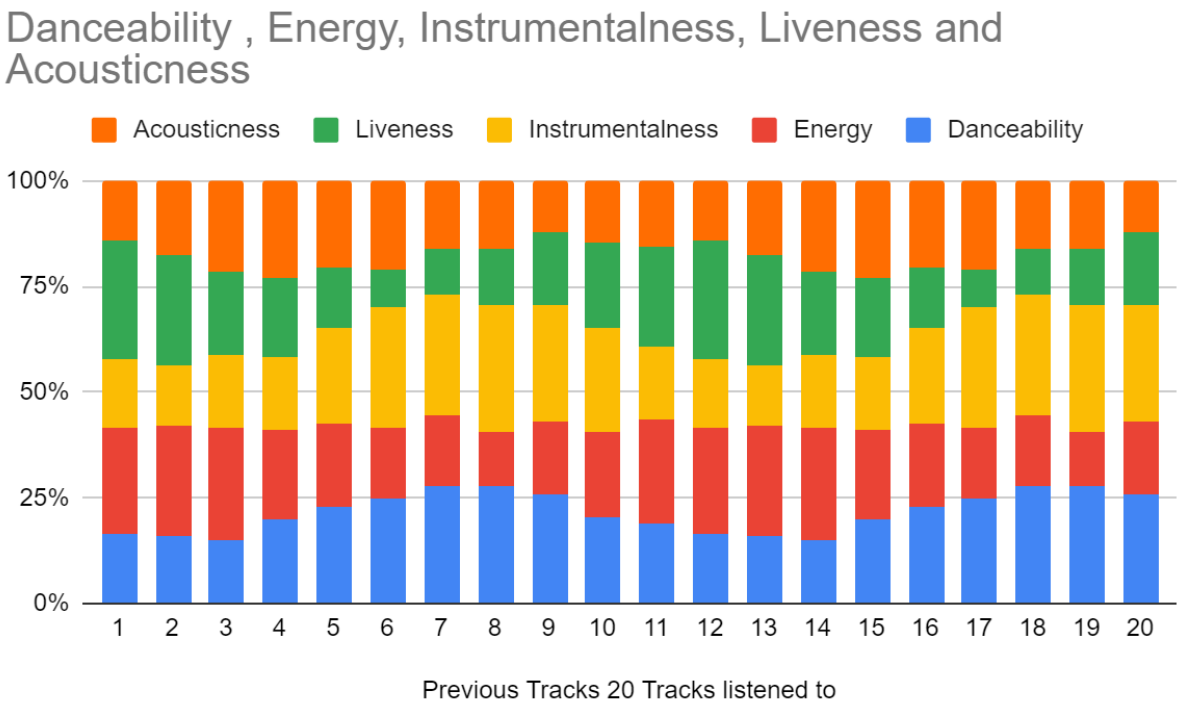


- Indicator 2: Detailed mood analysis of **20 previously played tracks**

    - https://developer.spotify.com/documentation/web-api/reference/player/get-recently-played/

- Count audio features of previous 24 tracks listened to
    - Scale of 0-100
    - Danceability
    - Energy
    - Instrumentalness
    - Liveness
    - Acousticness

- Take a Moving average of 5 tracks (view spreadsheet example)
- https://docs.google.com/spreadsheets/d/13LtH7BsxJAtgKcoGfyucT9OHo6WCeu5ckGEomVK1Yko/edit?usp=sharing
- Visualise moving averages of past 20 songs



- Indicator 3: Spotify mood of **saved tracks**

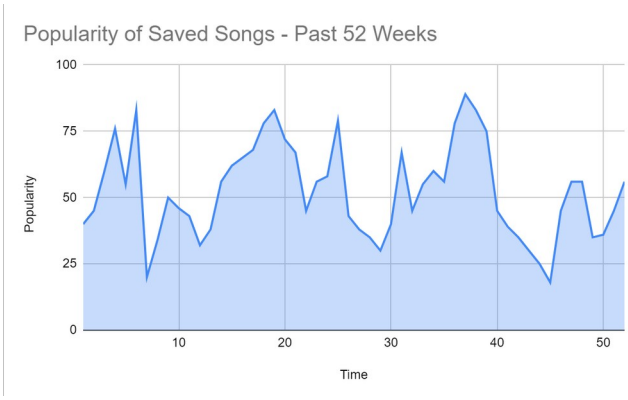
- Get Saved songs for past 26 weeks
- Count audio features of saved songs listened to
    - Scale of 0-100
    - Danceability
    - Energy
    - Instrumentalness
    - Liveness
    - Acousticness

- Take the mean and median values for each week
- Visualise mean and median values of each week of the past 26 weeks

- Indicator 4: Popularity graph

X-axis: Timestamp saved songs
Y-axis: Popularity of song

Graph = Average Popularity of saved track (0-100) within a week (show for last 52 weeks)



Every functionality which is written will first have to be put in pull requests on GitHub before being merged. Due to the fact that we need to optimise the code and decrease processing time, we will give you comments on the writing style before merging. Please think carefully about the optimal way to design the functionalities and then put each of them in a separate pull request.