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Spotify / iTunes

In our project, we want to analyze the most popular songs on the music streaming platform Spotify and try to find out whether there are any particular features that differentiate the top songs from the less popular ones. To accomplish this, we are using a dataset that was uploaded to Kaggle.com and contains 232.000 songs of 26 genres – or about 160.000 unique songs, since some tracks are assigned to multiple genres. The uploader obtained the data using the official Spotify API, which enables developers to get the following attributes of songs:

Popularity is a value between 0 and 100, based on plays that are weighed by their recency.

Duration gives the duration of a song in milliseconds.

Key is an estimation of the overall key of a track.

Mode is the modality or scale: major (German: Dur) or minor (German: Moll).

Time signature (or meter) specifies how many beats are in each measure (bar), e.g. 3/4.

Acousticness (0,0 to 1,0) that describes how "acoustic" a track is.

Danceability (0,0 to 1,0) says how suitable a song is for dancing based on tempo, rhythm, beat, etc.

Energy (0,0 to 1,0) estimates intensity and activity by measuring dynamic range, loudness etc.

Instrumentalness (0,0 to 1,0) aims to predict if a track contains vocals. High value → likely no vocals.

Liveness (0,0 to 1,0) tries to detect sounds made by an audience. High value → likely a live recording.

Loudness is measured as an average across an entire track. Values lie between -60 and 0 dB.

Speechiness describes the portion of a song made up by spoken words. High value → audio book etc.

Valence says how positive a track is. High value → happy or cheerful, low value → sad or angry.

Tempo is an estimate of the tempo measured in BPM (beats per minute).

Additionally, we want to determine features that make a song reach the Top 50 of a certain country and compare the results of five selected countries (Austria, Australia, Brazil, Japan and the United States) to see whether there are any discernible differences between them. The second dataset that we are using for this project, also downloaded from Kaggle.com, contains the data that we need for this analysis: for 53 countries, it lists the 200 most listened songs of every day between January 2017 and January 2018 – making for a total of 3.4 million observations. However, it does not contain any of the song features described above. Therefore, after creating a subset with only the data of the five countries that we want to analyze, we must merge this dataset with the first dataset to get the detailed song information.

Finally, we want to investigate if high worldwide popularity on Spotify leads to higher popularity in terms of worldwide digital purchases of songs on iTunes. This is an interesting issue, as according to some news reports, artists get paid less than 1 cent per play on streaming platforms and therefore need a large number of streams to generate the profit of a single digital sale. For this analysis, we are using a third dataset that we generated using data from Kworb.net, a website listing comprehensive chart rankings and sales statistics about multiple platforms, among them iTunes. The relevant data for our purposes was the worldwide "all-time" (2010-now) iTunes popularity, based on a song's performance in the iTunes Charts and therefore based on digital sales.

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Our main questions:

- Are there features that have an impact on the worldwide popularity of a song?
- Is there a difference between the features that make a song popular in different countries?
  - Comparison of five countries: Austria, Australia, Brazil, Japan, United States
- Does worldwide popularity on Spotify correlate with worldwide sales on iTunes?

Sources:

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