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Our Music Playlists

TikTok Versus Spotify

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Motivation

We wanted to explore and analyze the different features of songs on TikTok and Spotify to uncover potential similarities or differences that contribute to song popularity within these two popular platforms.





What is Spotify? What is TikTok?



Similarities

Music Streaming	<ul style="list-style-type: none">Both platforms are used for music streaming, allowing users to access a vast library of songs.
Social Interaction	<ul style="list-style-type: none">Both platforms offer social interaction features. Spotify allows users to share playlists and see what their friends are listening to, while TikTok thrives on user interaction through likes, comments, and shares.



What is Spotify? What is TikTok?

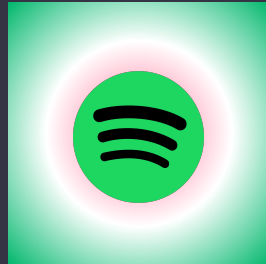


Differences

Content Format	<ul style="list-style-type: none">• Spotify mainly focuses on audio content where people usually do other activities while using Spotify (driving, studying, or exercising)• TikTok is a short-form video platform where users can create and share videos, often set to music.
Algorithm and Discovery	<ul style="list-style-type: none">• Spotify's algorithm focuses on music recommendations based on listening history.• TikTok's algorithm is designed to surface content based on user engagement, preferences, and trends.
Duration of Engagement	<ul style="list-style-type: none">• Spotify caters to longer listening sessions.• Users typically spend short durations on TikTok and only listen to a small part of a song due to the nature of its short-form videos.

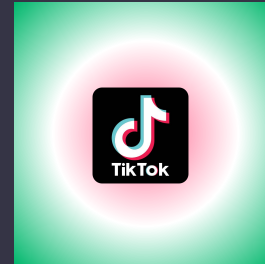


Data Collection



Spotify

We used a Kaggle Spotify dataset of the top songs from the year 2022. Popularity is measured by number of weeks on charts.



TikTok

We used a Kaggle TikTok dataset that had collected the most popular songs on TikTok for the year of 2022. Popularity is given a 0-100 score.



Your Top 5 Spotify Songs



#1

Shape of You

Ed Sheeran



#2

Say You Won't Let Go

James Arthur



#3

Believer

Imagine Dragons



#4

Perfect

Ed Sheeran



#5

goosebumps

Travis Scott





Your Top 5 TikTok Songs



#1

Glimpse of Us

Joji



#2

As It Was

Harry Styles



#3

Running Up That Hill (A Deal With God)

Kate Bush



#4

Late Night Talking

Harry Styles



#5

Jimmy Cooks (feat. 21 Savage)

Drake





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Common Ground

46



Common Songs

After collecting the top 200 songs from each dataset, there were 46 in common



Features to be Considered

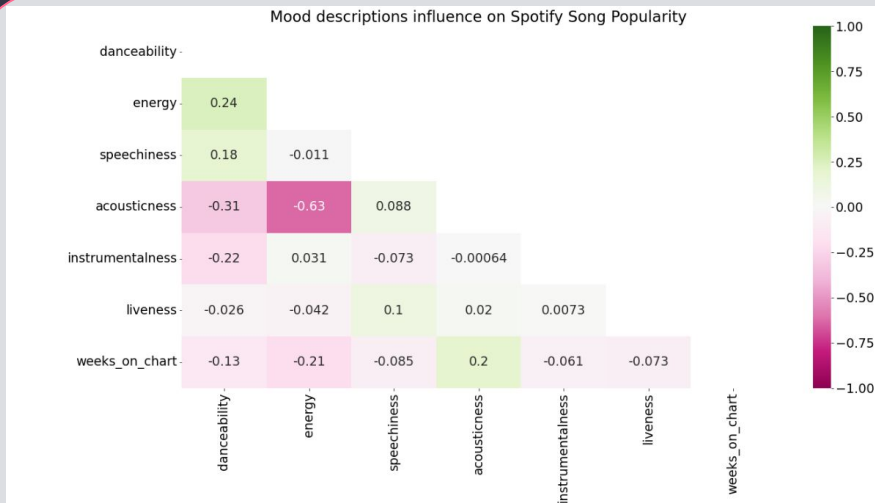


How do the different mood descriptions of the track influence popularity?

We took these features from both Spotify and TikTok datasets

Danceability	How suitable a track is for dancing based on a combination of musical elements
Energy	A measure of 0.0 to 1.0, representing a perceptual measure of intensity and activity
Speechiness	The presence of spoken words in a track
Acousticness	A confidence measure from 0.0 to 1.0 of whether the track is acoustic
Liveness	Detects the presence of an audience in the recording
Instrumentalness	Predicts whether a track contains no vocals

Mood Features of Spotify



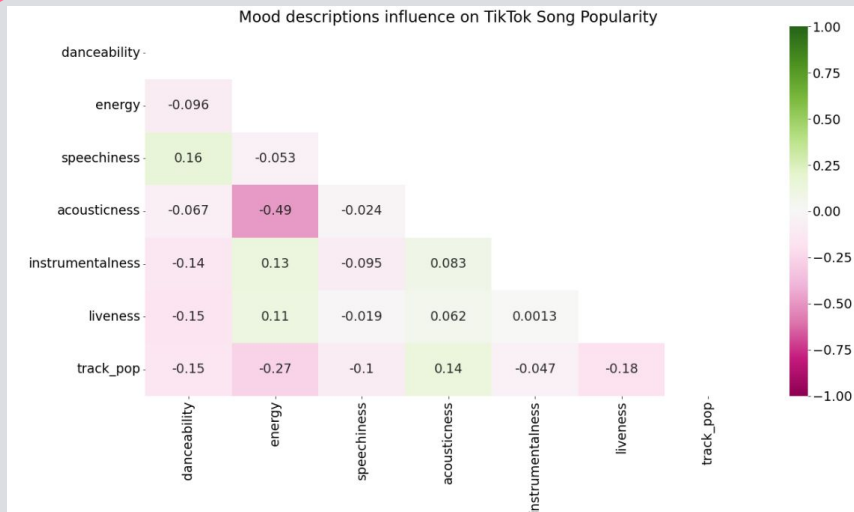
Most Correlated w/ Popularity

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Acousticness and Energy

- As acousticness increases, popularity increases.
- As energy decreases, popularity increases.

Mood Features of TikTok



Most Correlated w/ Popularity

Follow

Energy and Liveness

- As liveness decreases, popularity increases.
- As energy decreases, popularity increases.



Features to be Considered

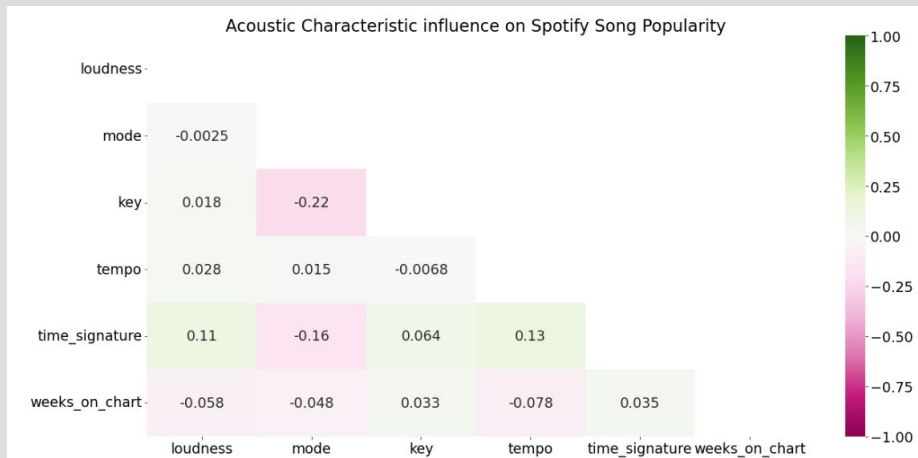


How do the different acoustic descriptions of the track influence popularity?

We took these features from both Spotify and TikTok datasets

Loudness	The overall loudness of a track in decibels (dB)
Mode	The modality (major or minor) of a track, the type of scale from which its melodic content is
Key	The key the track is in, map to pitches using standard Pitch Class notation (C#)
Tempo	The overall estimated speed of a track in beats per minute (BPM)
Time Signature	A notational convention to specify how many beats

Acoustic Features of Spotify

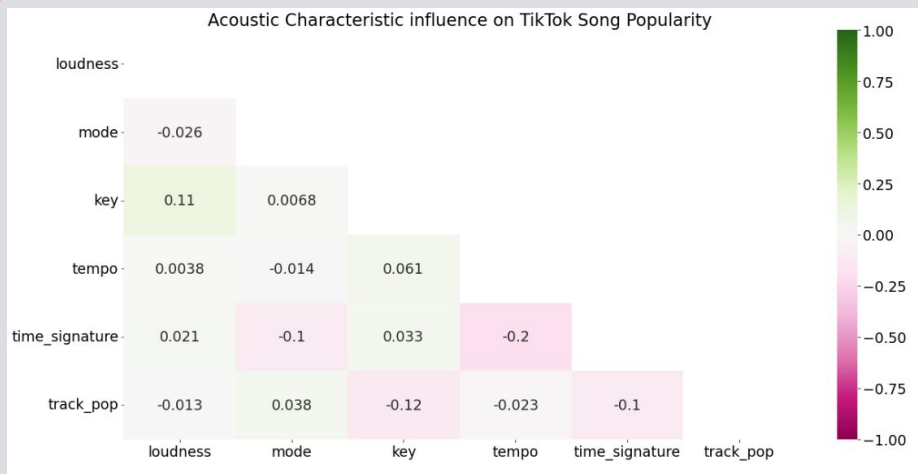


Most Correlated w/ Popularity

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None of these features are correlated with popularity.

Acoustic Features of TikTok



Most Correlated w/ Popularity

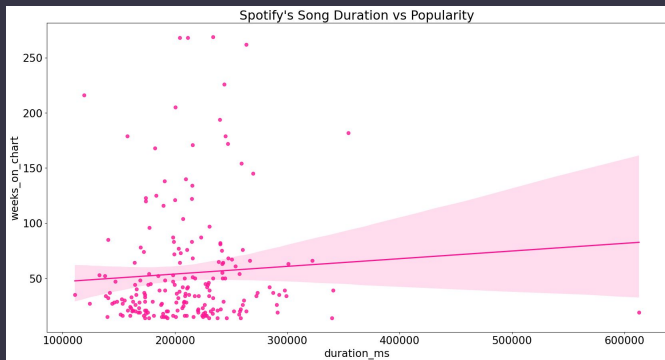
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Time and Key

- As number of beats per bar decreases, popularity increases.
- As key decreases, popularity increases.



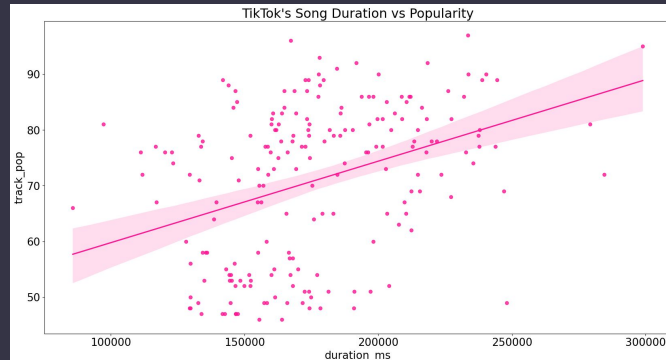
Duration vs Popularity



Spotify

~150,000 - 250,000ms

The average Spotify song duration from the top 200 set lies at about 200,000ms, with the most weeks on the chart lying in that range



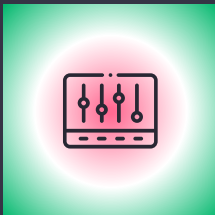
TikTok

~140,000 - 220,000ms

The average TikTok sound lasts around 180,000ms, with the most popular sounds lying in that range



Feature Conclusions



Duration

1h4min



There not a link between the duration of the track and popularity, but we did discover that popular TikTok songs are slightly shorter than popular Spotify songs.



Spotify

30min



Acousticness and energy are the features most correlated with popularity for Spotify songs.



TikTok

1h15min



Energy, liveness, time, and key are most correlated with popularity for TikTok songs.

Machine Learning



track_name	acousticness	energy	speechiness	liveness	key	time_signature	duration_ms	popularity_label
Shape of You	0.5810	0.652	0.0802	0.0931	1	4	233713	1
Say You Won't Let Go	0.6950	0.557	0.0590	0.0902	10	4	211467	1
Believer	0.0622	0.780	0.1280	0.0810	10	4	204347	1
Perfect	0.1630	0.448	0.0232	0.1060	8	3	263400	2
goosebumps	0.0847	0.728	0.0484	0.1490	7	4	243837	2
Jocelyn Flores	0.4690	0.391	0.2420	0.2970	0	4	119133	2
lovely (with Khalid)	0.9340	0.296	0.0333	0.0950	4	4	200186	2
Lucid Dreams	0.3490	0.566	0.2000	0.3400	6	4	239836	1
Bohemian Rhapsody - Remastered 2011	0.2710	0.404	0.0499	0.3000	0	4	354320	1
Sunflower - Spider-Man: Into the Spider-Verse	0.5330	0.522	0.0575	0.0685	2	4	157560	1

Goal:

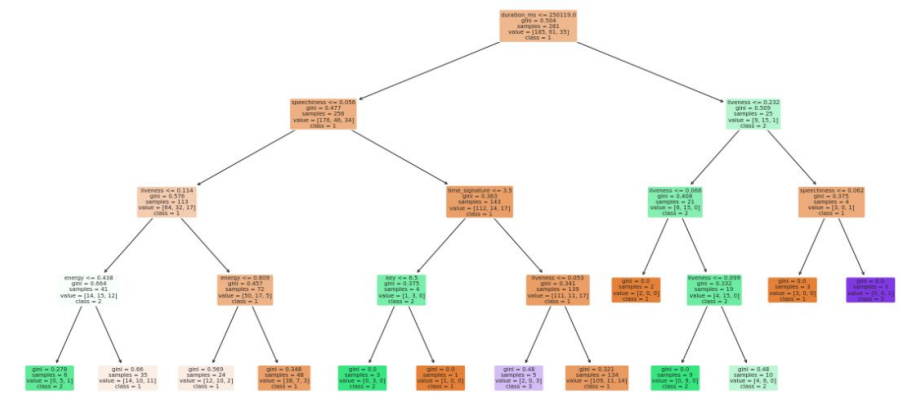
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Utilized correlated features of popular songs on Spotify and TikTok to develop a model capable of predicting if a song will become popular on either platform or on both platforms

- Merged the two datasets
- Added a popularity_label column
 - 1 = popular on TikTok
 - 2 = popular on Spotify
 - 3 = popular on both platforms

Decision Tree Classifier

Training Accuracy: 0.7330960854092526
Test Accuracy: 0.5492957746478874



Lessons:

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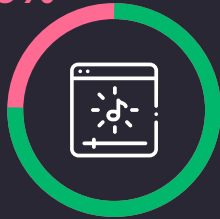
- Dataset is too small
- Dataset is imbalanced with only 46 songs that are popular on both platforms
- Features used might be too weakly correlated to discern meaningful patterns



Overall Conclusion



25%



75%

- TikTok
- Spotify

Top Findings



Duration

Shorter songs tend to be more popular on TikTok due to it being a short-form video platform.



Popularity

Our data analysis sheds light on to the difficult concept of popularity in the dynamic landscape of music by analyzing the correlated features of popular songs.

Our findings show potential to help artists to tailor their music for specific platforms.