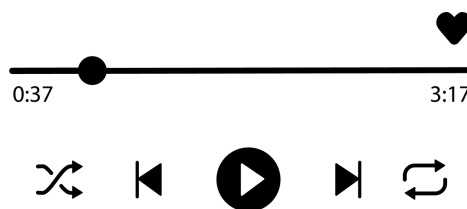By: Anisa Mohamed

Spotify Songs

0:37   3:17

Introduction

Through playlists, customized recommendations, and genre-specific trends influencing the listening experience, Spotify has completely changed how people listen to music. Understanding the factors that influence a songs popularity is useful not only for streaming services, but also for artists and producers looking to create music that resonates with their target audience. Understanding genre defining traits allows us to identify patterns that reflect changing cultural and musical interests.

I chose to explore the Spotify Songs dataset, which is an extensive dataset that contains <u>32,833</u> songs in well-known genres such as pop, EDM, Rap, Rock, Latin, and R&B. This dataset offers a unique angle for examining the relationship between song popularity and certain musical elements like tempo, energy, and danceability. It also enables us to identify trends that demonstrate how listeners' musical and cultural tastes are changing. These insights not only enhance our understanding of current trends but can also influence how music is created and produced in the future.

In this project, i am to uncover 2 questions:

 1) How do audio features like tempo, energy, and danceability affect song popularity across genres?

2) Are there seasonal trends in music popularity based on genre?

This analysis, which examines the relationship between audio elements and song popularity as well as seasonal trends, can give useful data for all stakeholders in the music industry, from artists and producers to streaming platforms and consumers. I will use visualizations like linecharts to highlight patterns.

Data Preparation

I first Identified variables relevant to my questions and removed the ones that were not:

Question 1: How do audio features affect song popularity?

- **Variables:** danceability, energy, tempo, track_popularity, playlist_genre.

Question 2: Are there seasonal trends?

- **Variables:** track_album_release_date, playlist_genre, track_popularity.

Then, I standardized text-based columns like (playlist_genre) to ensure consistent formatting and bold them, i also expanded the rows so the text can viewed. I Checked for missing values in relevant variable columns. I Identified and removed tracks with exceptionally low popularity (track_popularity = 0) as they may represent anomalies or unplayed songs. I Examined the dataset for missing values, particularly in columns like track_name, track_artist, and track_album_name. I also removed rows where both track_name and track_artist were missing, as these entries were deemed unimportant for the analysis.
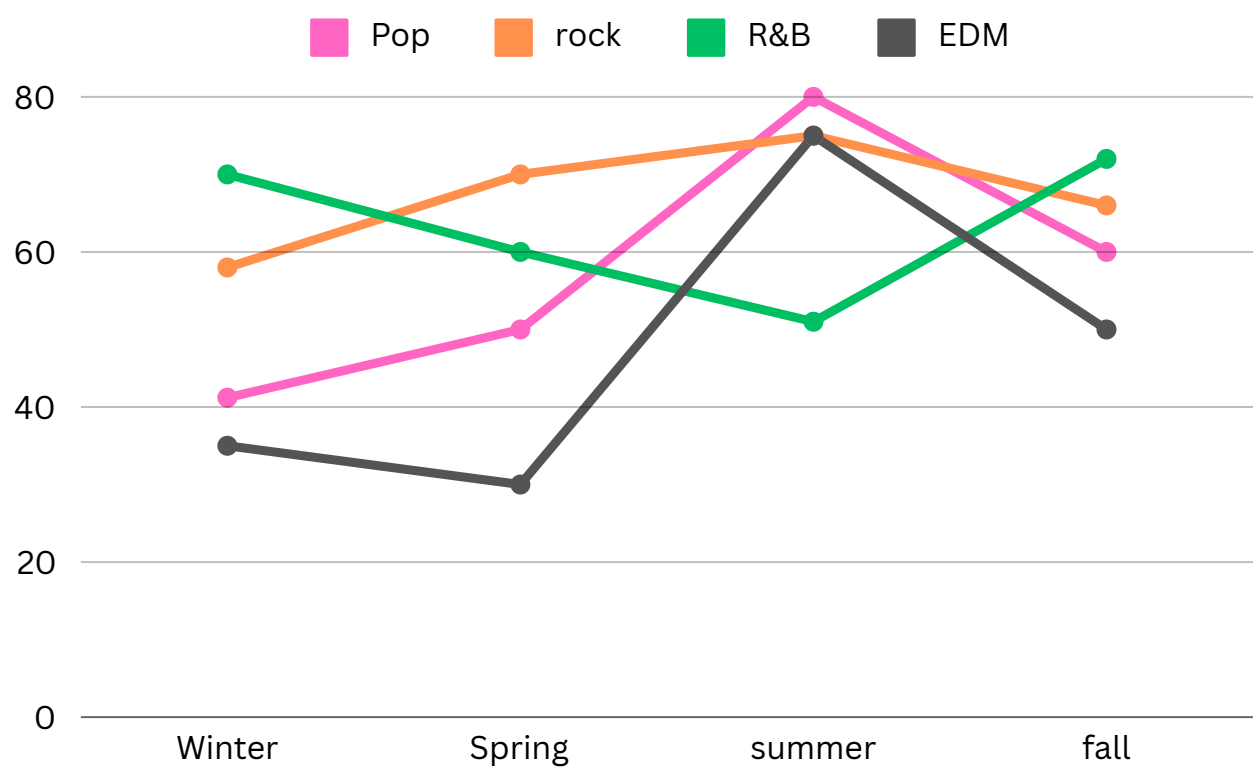
	Track Artist	Track Popularity	Track Album Name	Track Album Release Date	Seasons	Playlist Genre	Danceability	Energy	Valence	Tempo	Duration ms	Durati
with Justin Bieber) - Loud Luxury Remix	Ed Sheeran	66	I Don't Care (with Justin Bieber) [Loud Luxury Remix]	6/14/19	spring	pop	0.748	0.916	0.518	122.036	194754	
illon Francis Remix	Maroon 5	67	Memories - Dillon Francis Remix	12/13/19	winter	pop	0.726	0.815	0.693	99.972	162600	
Don Diablo Remix	Zara Larsson	70	All the Time (Don Diablo Remix)	7/5/19	summer	pop	0.675	0.931	0.613	124.008	176616	
: - Keanu Silva Remix	The Chainsmokers	60	Call You Mine - The Remixes	7/19/19	Summer	pop	0.718	0.93	0.277	121.956	169093	2.8
u Loved - Future Humans Remix	Lewis Capaldi	69	Someone You Loved (Future Humans Remix)	3/5/19	Winter	pop	0.65	0.833	0.725	123.976	189052	3.1
ople (feat. Khalid) - Jack Wins Remix	Ed Sheeran	67	Beautiful People (feat. Khalid) [Jack Wins Remix]	7/11/19	Summer	pop	0.675	0.919	0.585	124.982	163049	2.7
Over - R3HAB Remix	Katy Perry	62	Never Really Over (R3HAB Remix)	7/26/19	Summer	pop	0.449	0.856	0.152	112.648	187675	3.1
(feat. RANI) - GATTUSO Remix	Sam Feldt	69	Post Malone (feat. RANI) [GATTÜSO Remix]	8/29/19	Summer	pop	0.542	0.903	0.367	127.936	207619	3.4
Tiesto Remix / Radio Edit	Avicii	66	Tough Love (Tiësto Remix)	6/14/19	spring	pop	0.594	0.935	0.366	127.015	193187	3.2
e You - Gryffin Remix	Shawn Mendes	67	If I Can't Have You (Gryffin Remix)	6/20/19	summer	pop	0.642	0.818	0.59	124.957	253040	4.2
st. Chance the Rapper & PnB Rock) - M-22 Remix	Ed Sheeran	58	Cross Me (feat. Chance the Rapper & PnB Rock) [M-22 Remix]	6/21/19	summer	pop	0.679	0.923	0.752	121.984	207894	
HAB Remix	Ellie Goulding	67	Hate Me (R3HAB Remix)	8/16/19	summer	pop	0.437	0.774	0.329	123.125	203733	
	Loud Luxury	67	Body On My	3/29/19	spring	pop	0.744	0.726	0.687	121.985	192507	
ck Luke Tribute Remix / Radio Edit	Avicii	68	SOS (Laidback Luke Tribute Remix)	5/17/19	spring	pop	0.572	0.915	0.678	123.919	164516	2.7
s (feat. Macklemore & Patrick Stump of Fall Out Boy) - Tiesto Remix	Martin Garrix	63	Summer Days (feat. Macklemore & Patrick Stump of Fall Out Boy) [Remixes]	7/12/19	summer	pop	0.69	0.78	0.238	126.07	255238	4.2
Border (feat. Camila Cabello & Cardi B) - Andy Jarvis Remix	Ed Sheeran	66	South of the Border (feat. Camila Cabello & Cardi B) [Andy Jarvis Remix]	12/11/19	winter	pop	0.805	0.835	0.722	125.028	188230	3.1
s - Eden Prince Remix	AJ Mitchell	60	All My Friends (Eden Prince Remix)	5/3/19	spring	pop	0.694	0.901	0.368	118.051	173548	2.8
s (feat. Bebe Rexha & J Balvin) - Lucas & Steve Remix	David Guetta	65	Say My Name (feat. Bebe Rexha & J Balvin) [Lucas & Steve Remix]	12/28/18	Winter	pop	0.678	0.747	0.516	120.002	189375	
A Stranger (With Normani) - Cheat Codes Remix	Sam Smith	69	Dancing With A Stranger (With Normani) [Cheat Codes Remix]	3/8/19	Winter	pop	0.746	0.557	0.324	111.961	159404	2.6
Sondr Remix	Steve Aoki	35	Let It Be Me (Remixes)	10/18/19	fall	pop	0.467	0.821	0.232	122.676	185366	3.0
id Guetta & MORTEN Remix	Avicii	70	Heaven (David Guetta & MORTEN Remix)	8/23/19	fall	pop	0.572	0.934	0.204	125.948	215238	
e World (La La La) - Marnik Remix	R3HAB	64	All Around The World (La La La) [Marnik Remix]	8/23/19	fall	pop	0.708	0.913	0.707	135.016	170667	
Me Alone (feat. Anne-Marie) - EDX's Indian Summer Remix	David Guetta	62	Don't Leave Me Alone (feat. Anne-Marie) [EDX's Indian Summer Remix]	5/8/19	spring	pop	0.684	0.818	0.336	123.938	210968	3.5
feat. Ava Max - Sam Feldt Remix	AJ Mitchell	70	Slow Dance (feat. Ava Max) [Sam Feldt Remix]	10/25/19	fall	pop	0.732	0.85	0.372	124.024	193548	

I created a new variable named Song Duration Minutes by converting the Duration MS to minutes and dividing by 60,000. I changed this to make it easier to understand the song length. I also added a seasons variable by using the track number release date and categorizing tracks by release month as Winter, Spring, Summer, or Fall.

Visualize Data:

Genre	Avg Tempo	Avg Energy	Avg Dance.	Avg Popularity
Pop	121	0.70	0.75	60
EDM	113	0.75	0.65	51
Rock	110	0.60	0.56	49
R&B	72	0.55	0.65	53
Rap	74	0.63	0.61	42
Latin	89	0.58	0.61	50

According to the data, songs from genres with higher energy levels, like pop and EDM, are more likely to be popular. This indicates that a song's success may be significantly affected by its energy.

Pop and EDM music are likely to reach its peak in the summer since their lively and upbeat aspects appeal to audiences during the warmer months, the music is played at festivals, vacations, and outdoor events. These genres are popular in the summer because of their ability to improve moods and liven up social

gatherings. In contrast, R&B is more likely to reach its highest point in the winter. R&B's soulful and soothing sound goes well with the holiday season's quiet and somber vibe, and it frequently becomes a staple on playlists during this season. Rock, Latin, and Rap are among the genres that show more consistent yearly trends without noticeable seasonal increases. Both of these genres are played all year round and appeal to a broad audience. They are also unrelated to any particular season. Due to its lively sounds, Latin music might see some rise during the summer months, but it doesn't peak like Pop and EDM.