My Spotify Data Analysis

Motivation: Why am I working on this project?

My project is motivated by a desire to gain deeper insights into my own music listening patterns to gaining insights and understanding my personal music listening habits and preferences. It's common for people to be curious about their own music consumption patterns, and this project provides a way to analyze and visualize those patterns.It's a way to connect more with my musical preferences and understand the trends in my listening behavior. It's an excellent opportunity to practice and showcase my skills in Python programming, data analysis, and visualization. Working with the Spotify API in particular can add a valuable dimension to my coding and data analysis repertoire.

Data source: Where did I get this data? How did I collect it?

My data is obtained from Spotify's Web API, which provides a rich set of endpoints to access various music-related data. Spotipy, a Python library for Spotify's Web API, simplifies the process of accessing this data. Specifically, I am analyzing my personal Spotify data, including top artists, tracks, genres, and listening trends over different time ranges.

Data analysis:

Techniques:

Data Fetching: Retrieving data from Spotify's API.

Data Aggregation and Transformation: Aggregating data based on different criteria like genres, artists, and timeframes.

Exploratory Data Analysis: Using Pandas for data manipulation and exploration.

Visualization: Creating various charts and plots using Matplotlib to visualize my music listening patterns.

Stages:

Data Collection: Fetching data from Spotify using Spotipy.

Data Cleaning and Preparation: Processing and structuring the data for analysis.

Exploratory Analysis: Understanding the basic patterns and trends.

In-depth Analysis: Diving deeper into specific aspects like genre trends, artist preferences, and listening habits.

Visualization: Graphically representing the data for easier interpretation.

Findings: What did I learned about myself?

I learned about my personal music preferences. I had insights into my favorite genres, artists, and tracks, and how these preferences vary over different time periods. I analized my listening habits, had an understanding of how my listening habits change over time, such as preferred times of day for listening to music, and how these habits compare to global trends. had done trend analysis, identification of trends, such as emerging genres or artists in my listening behavior over different time frames.

Limitations and future work: What could be done better?

Data Scope: The analysis is limited to the data provided by Spotify. Expanding the data source to include other music platforms or social media reactions could provide a more comprehensive view.

Algorithmic Bias: The recommendations and data from Spotify are influenced by its algorithms, which may skew the analysis based on the platform's suggestion patterns.

Longitudinal Study: Extending the analysis over a longer period could reveal more about how your music tastes evolve.

Do I have any future plans about my project?

Integration with Other Services: I am considering integrating data from other music services or platforms to broaden the analysis scope.

Social Aspect: Analyzing how my music preferences correlate with social trends or events could add an interesting dimension.

Collaborative Features: Adding features where you can compare your tastes with friends or other users, fostering a social aspect to your project.

My Hypothesis

The prevailing moods reflected in the audio features of my frequently played tracks, along with the influence of globally viral songs, are significant determinants of my music taste.

There is a quantifiable correlation between the audio features of tracks that I frequently listen to and my emotional state or mood. Concurrently, there is an observable trend where my music preference aligns with the attributes of songs that are globally recognized as 'viral' or 'trending'. The combination of these factors forms the basis of my music taste.

A preference for tracks with specific audio features during different times of the day or week, indicating mood-based music selection.

A significant overlap between my frequently played tracks and songs featured in global viral charts, suggesting external influence on music choice.

Mood Influence: My project delves deep into the audio features of the tracks I've listened to, such as danceability, energy, and tempo. The fluctuations in these features over different times reflect changes in my mood, suggesting a correlation between the type of music I choose and my emotional state at the time.

Global Trends Impact: By comparing my top genres with global trends and identifying new interests or declining genres, my project indicates how global viral songs or trends influence my music preferences. It seems to be I am in tune with global music movements, integrating them into my personal playlist, which supports the hypothesis that global trends significantly shape my music taste.

Data Analysis and Visualization: The project employs various data analysis techniques and visualizations to showcase patterns in my music listening habits, both on a personal level and in relation to global trends. The scatter plots, bar charts, and heatmaps provide visual evidence supporting the hypothesis.

Machine Learning Insights: The use of a machine learning model to predict track popularity based on audio features suggests that certain characteristics of music are more appealing to me. This can be correlated with my mood and preferences, reinforcing the idea that my music taste is mood-driven.

Temporal Changes in Preferences: Analyzing my top genres over different time frames (long-term, medium-term, and short-term) reveals how my preferences evolve over time, in response to mood shifts and global music trends.

In conclusion, the outputs and analysis of my Spotify data strongly suggest that my music taste is a blend of personal mood influences and the impact of global music trends. My project effectively captures and visualizes these aspects, providing a comprehensive understanding of what forms my music preferences.

Understanding the purpose

My Favorite Artists

In here I am displaying my top favorite artists from last year based on my Spotify data. The purpose of this code is to provide insight into my music preferences by showcasing the artists I listened to the most during the past year. This information is going to be useful for understanding my musical taste and will be used as input or features in my broader project for music analysis and predictions.

Your Top 5 Favorite Artists from Last Year:

1. Doja Cat

2. Duman

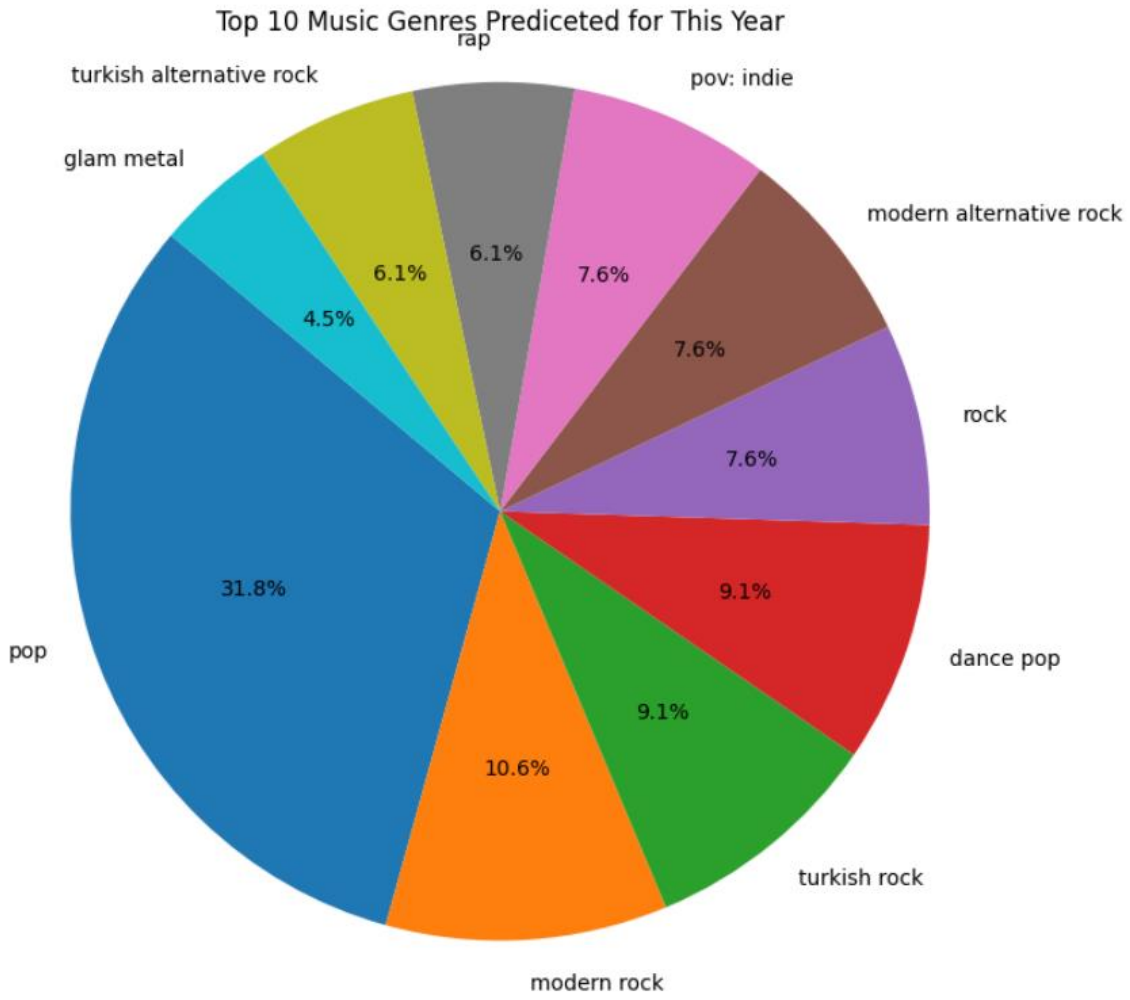
3. The Weeknd

4. BØRNS

5. Billie Eilish

My Favorite Genres

This is an analysis of the genres of my top music tracks for the current year. I got my top tracks for the "long_term" time range. These are the tracks I have listened to the most over an extended period. I iterate through my top tracks and, for each track, extract the artist's ID. Using the artist's ID, I fetch information about the artist, including their associated genres and visualize the top 10 music genres based on the genre counts. The chart displays the genre names and their respective percentages of my top tracks for the current year. The purpose of this part is to provide a visual representation of my music genre preferences for the current year. This information is valuable for understanding my music taste and will be used as part of my project for music analysis and predictions.



Recommended Songs Playlist

Purpose of this part is to leverage Spotify's recommendation algorithms to discover new music based on my established preferences. It automates the process of playlist creation, making it easier to explore music that aligns with my tastes. This could be a practical tool for music discovery and enjoyment within your project. It works by taking my top artists over a long-term period and generating a personalized Spotify playlist based on that data.

Playlist "Recommended Songs" created with 25 recommended songs!

Content of the "Recommended Songs" playlist:

Track: Like That (feat. Gucci Mane), Artists: Doja Cat, Gucci Mane

Track: vampire, Artists: Olivia Rodrigo

Track: Swim, Artists: Chase Atlantic

Track: The Way I Are, Artists: Timbaland, Keri Hilson, D.O.E.

Track: My Type, Artists: Saweetie

Track: Yalnızlık Senfonisi, Artists: Model

Track: Zaman Yok, Artists: Son Feci Bisiklet

Track: Hepinize El Salladım, Artists: Adamlar

Track: Manası Yok, Artists: Duman

Track: Aşkın Kanunu, Artists: Tuğkan

Track: I Know, Artists: Big Sean, Jhené Aiko

Track: Lust For Life (with The Weeknd), Artists: Lana Del Rey, The Weeknd

Track: Work, Artists: Rihanna, Drake

Track: Stay Ready (What A Life), Artists: Jhené Aiko, Kendrick Lamar

Track: SAD GIRLZ LUV MONEY Remix (feat. Kali Uchis and Moliy), Artists: Amaarae, Kali Uchis, Moliy

Track: Motion Sickness, Artists: Phoebe Bridgers

Track: Perfect Places, Artists: Lorde

Track: Knee Socks, Artists: Arctic Monkeys

Track: All We Ever Knew, Artists: The Head And The Heart

Track: Are You Bored Yet? (feat. Clairo), Artists: Wallows, Clairo

Track: Never Be the Same, Artists: Camila Cabello

Track: Never Be the Same, Artists: Camila Cabello

Track: I Bet on Losing Dogs, Artists: Mitski

Track: Heal, Artists: Tom Odell

Track: Afraid, Artists: The Neighbourhood

Track: Here, Artists: Alessia Cara

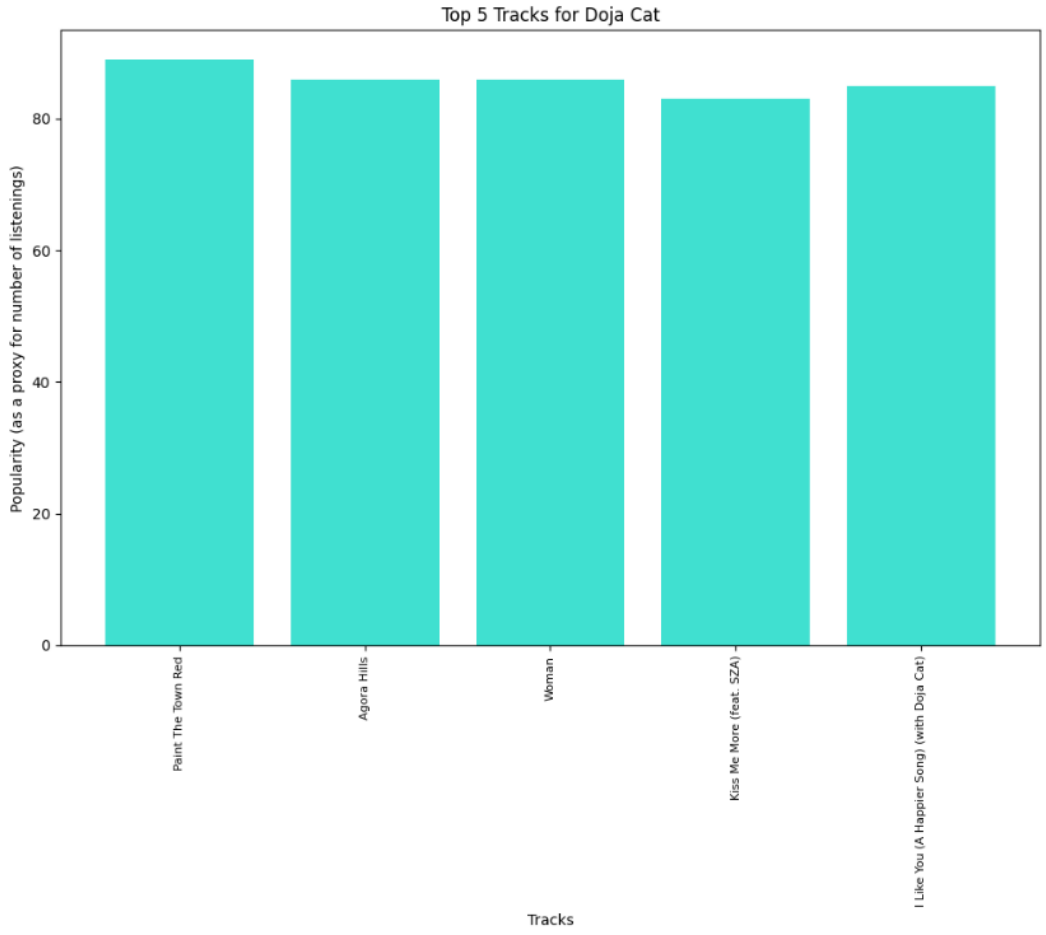
My Top Artists' Top Songs

This part is designed to create an interactive widget in that allows you to visualize my the top tracks and their popularity for my favorite artists on Spotify. The purpose of this part within my project is to provide a user-friendly interface for exploring the data collected from Spotify. By clicking on an artist's name, which are my top 3 most listened artists from long-term period, you can quickly see a visual representation of their most popular tracks according to Spotify's data. This is particularly useful for presentations or for users who prefer interactive visual data exploration over reading raw data or navigating through text-based menus. It is a step towards making my analysis more accessible and engaging to a wider audience.

Doja Cat

Duman

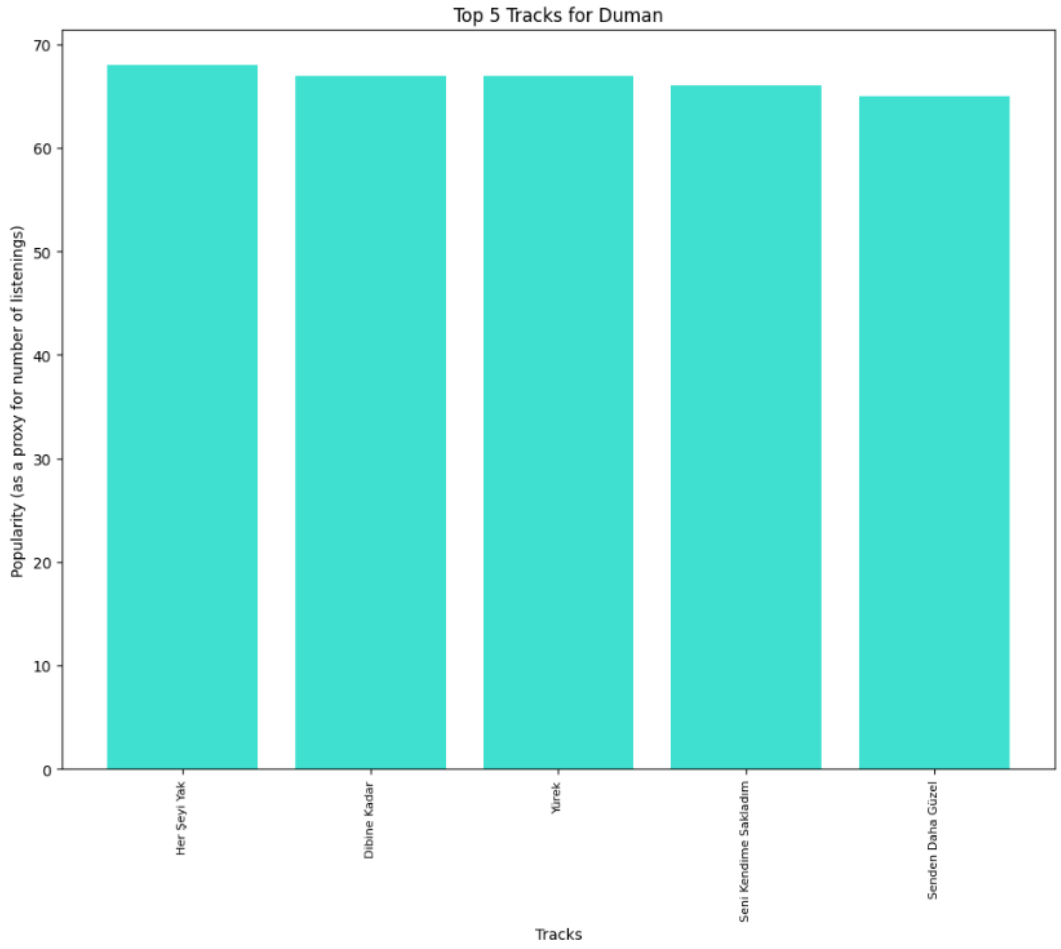
The Weeknd

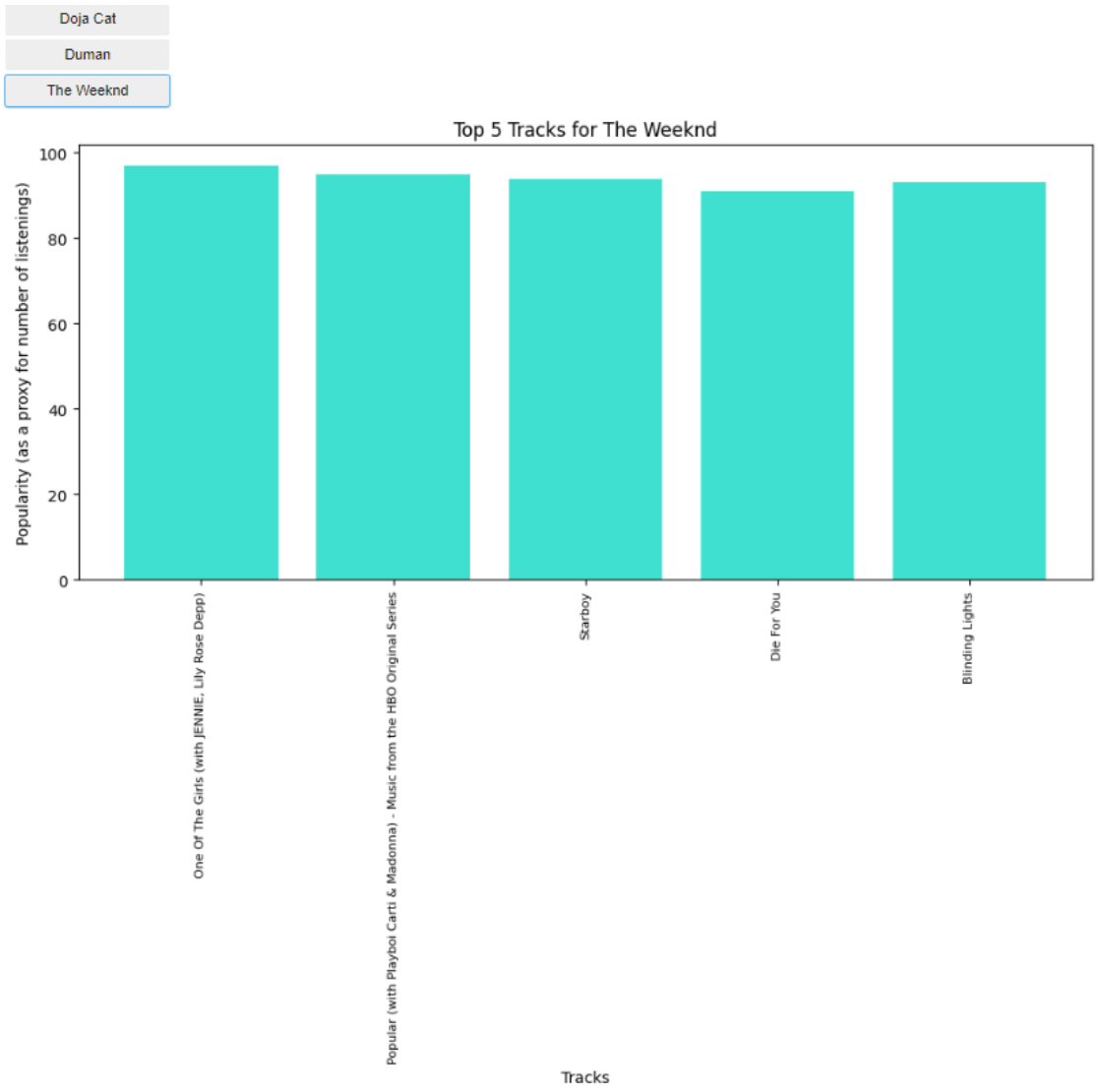


Doja Cat

Duman

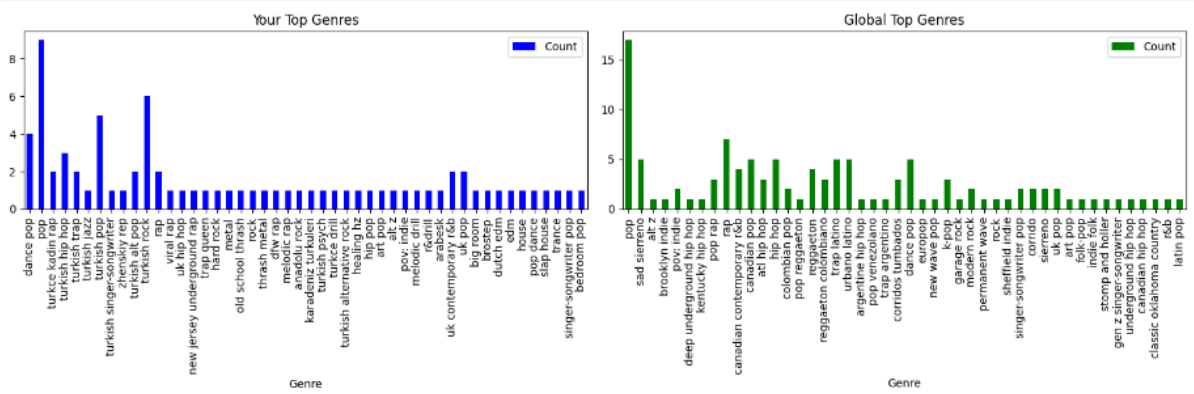
The Weeknd





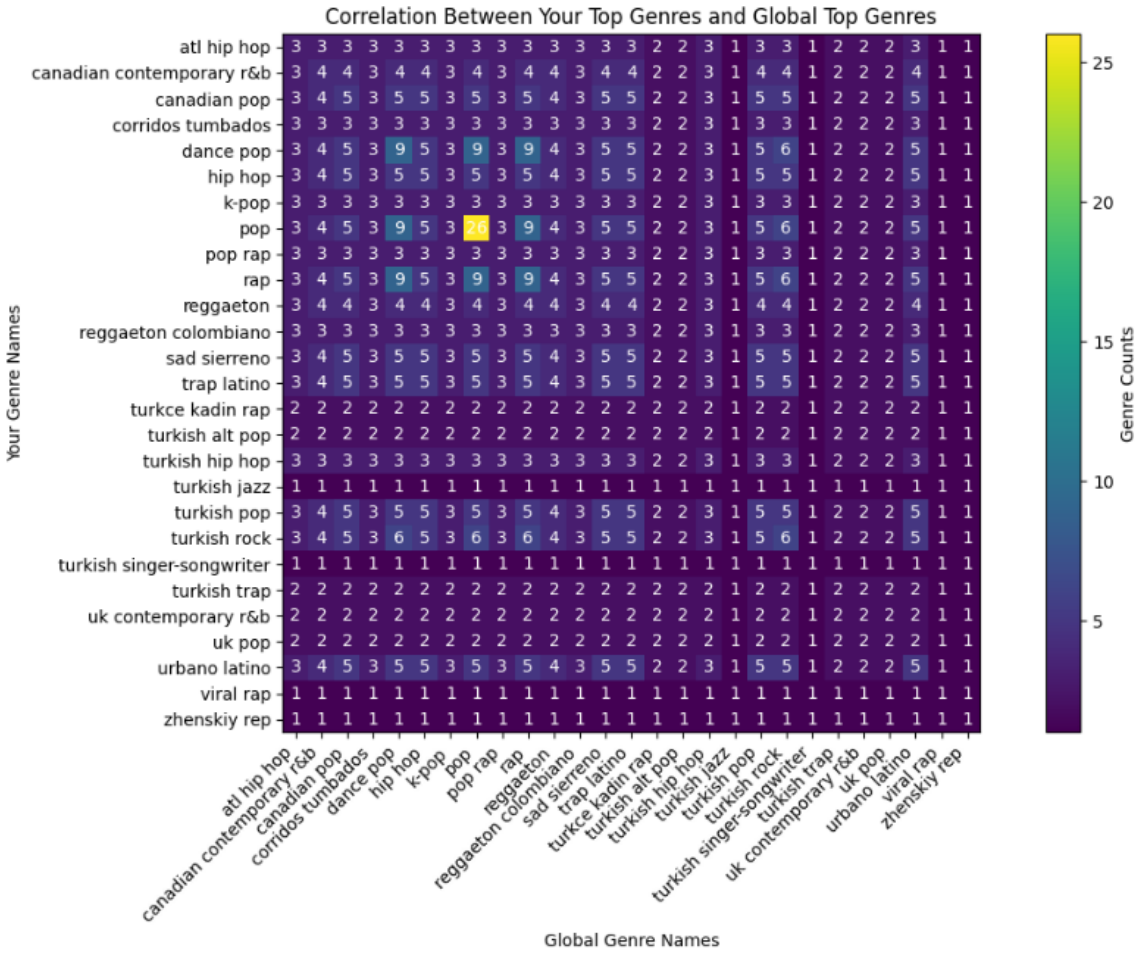
Comparing My Top and Global Genres

These graphs outlines a process for comparing my top music genres with the global top genres. The purpose of this code in the context of my project is to provide insights into how my personal musical tastes align with or differ from the broader global music trends. This can help in understanding the uniqueness of my music preferences or in discovering new genres that are popular globally.



Correlation on My Top and Global Genres

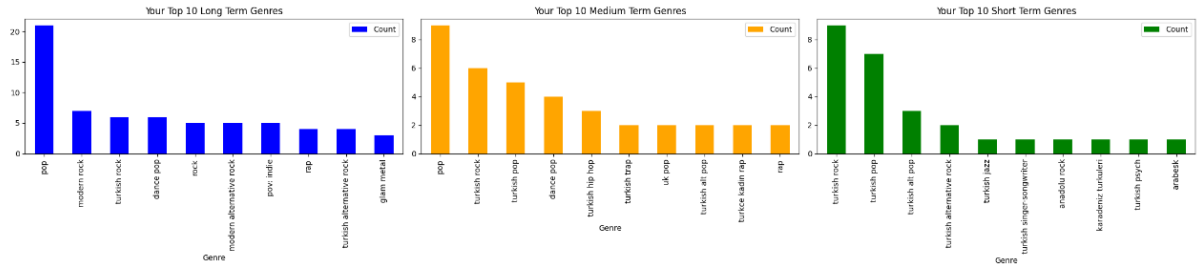
Now I have further analyzed my music preferences by comparing my top genres with global trends. The purpose of this analysis within my project is to explore the intersection and divergence between my personal music tastes and the wider global listening patterns. This can reveal insights such as which genres are uniquely preferred by me versus those that are universally popular. It's a method of situating personal taste within the context of global music trends.



My Top Genres in Different Terms

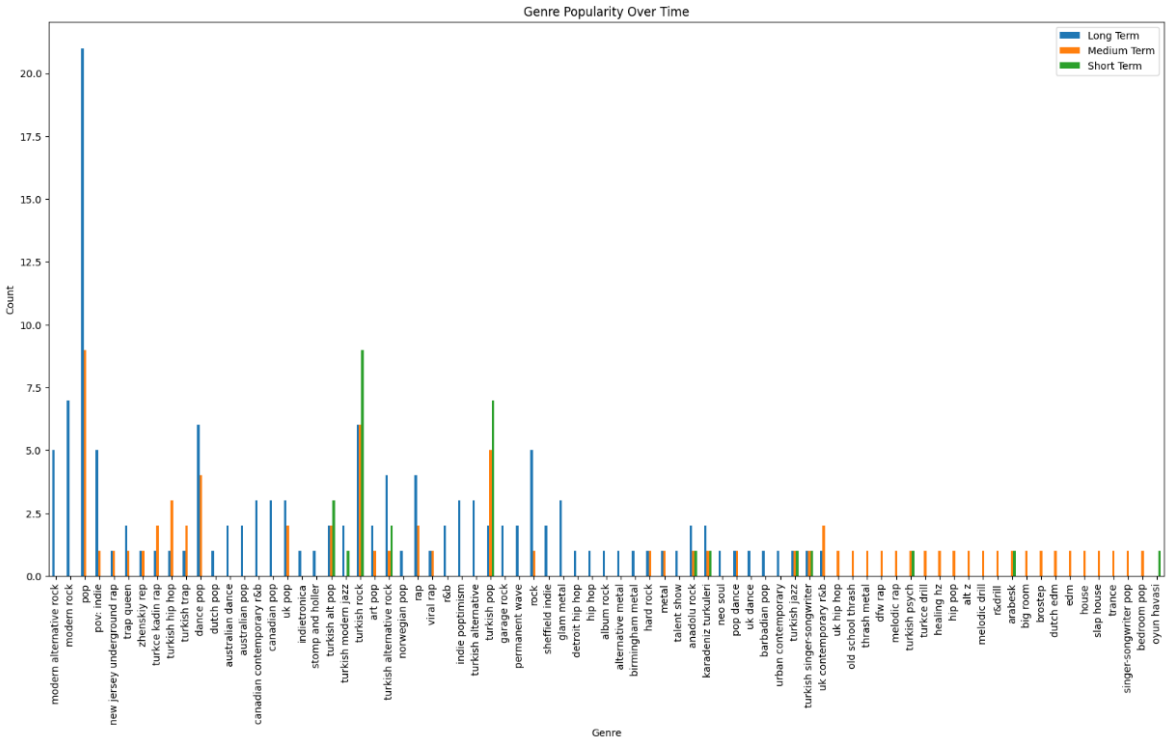
In here I implemented a multi-stage process to analyze my music genre preferences over different time frames using the Spotify API. I collected my top genres from Spotify for three different time ranges: long-term, medium-term, and short-term. This allows us to observe how my music tastes may have evolved over time. I created dictionaries for each time range, counting how many times each genre appears in your my tracks. This provides a quantitative measure of my preference for each genre. I plot this data in bar charts, showing the top 10 genres for each time range side-by-side. This visual comparison makes it easy to spot trends and changes in my music preferences.

[8]:



Changes in My Genres

In the this part I combined the data from all three time frames in the previouse graphs into a single DataFrame to analyze trends. I identify genres that are 'Trending Up' (genres that are more popular in the short term than the medium term), 'New Interest' (genres that appear in the short term but not the long term), and 'Losing Interest' (genres that have decreased in count from long to medium to short term). Then plot all genres across the three time frames in a combined bar chart to visually compare their popularity. This helps to illustrate my shifting genre preferences over time and can highlight any patterns or shifts in my music listening habits. It includes my genre preferences across the time frames, as well as boolean columns indicating whether a genre is trending up, is a new interest, or I am are losing interest in it.



	Long Term	Medium Term	Short Term	Trending Up
modern alternative rock	5	0	0	False
modern rock	7	0	0	False
pop	21	9	0	False
pov: indie	5	1	0	False
new jersey underground rap	1	1	0	False
...	...	...	...	...
slap house	0	1	0	False
trance	0	1	0	False
singer-songwriter pop	0	1	0	False
bedroom pop	0	1	0	False
oyun havasi	0	0	1	True

	New Interest	Losing Interest
modern alternative rock	False	False
modern rock	False	False
pop	False	True
pov: indie	False	True
new jersey underground rap	False	False
...	...	...
slap house	False	False
trance	False	False
singer-songwriter pop	False	False
bedroom pop	False	False
oyun havasi	True	False

[77 rows x 6 columns]

My Playlist Analysis

These are detailed information about tracks from one of my Spotify playlist and analysis of their audio features.The purpose of this process is to gain insights into the audio characteristics of the songs in a particular playlist, which is going to be used to understand my music preferences in terms of the audio features that Spotify tracks. This is also going to be used to identify patterns or trends within my favorite songs. It's an in-depth look at what makes up the music I prefer, informing future music recommendations or the curation of playlists that match certain moods or activities.

	danceability	energy	key	loudness	mode	speechiness	acousticness	\
0	0.6260	0.97600	4	-5.100	0	0.0584	0.1570	
1	0.3040	0.71500	9	-5.848	0	0.0371	0.0702	
2	0.5820	0.81200	4	-5.423	0	0.0324	0.1430	
3	0.1810	0.73000	7	-6.552	1	0.0605	0.0296	
4	0.4970	0.85700	4	-5.525	0	0.0564	0.1570	
5	0.4770	0.89500	4	-4.832	0	0.0729	0.0433	
6	0.7430	0.63900	9	-6.515	1	0.0563	0.6330	
7	0.2970	0.48800	3	-6.896	1	0.0344	0.0862	
8	0.6740	0.86500	2	-5.899	0	0.1860	0.2720	
9	0.5780	0.88500	9	-6.669	1	0.0361	0.0126	
10	0.3400	0.48900	7	-15.316	1	0.0412	0.8300	
11	0.4560	0.11700	2	-18.909	1	0.0421	0.9360	
12	0.4690	0.23700	9	-14.487	0	0.0335	0.9710	
13	0.2480	0.05820	7	-23.715	0	0.0440	0.9260	
14	0.1540	0.20300	4	-15.904	0	0.0799	0.9820	
15	0.3680	0.14700	6	-12.492	1	0.0384	0.9570	
16	0.4250	0.09280	7	-21.333	1	0.0431	0.9250	
17	0.3140	0.53500	9	-10.421	1	0.0305	0.7710	
18	0.4830	0.07240	4	-29.828	0	0.0325	0.9200	
19	0.3830	0.22900	2	-13.885	1	0.0336	0.8320	
20	0.4230	0.34400	5	-13.491	1	0.0457	0.9480	
21	0.2300	0.04870	5	-27.675	1	0.0412	0.9860	
22	0.5750	0.22400	2	-14.469	1	0.0384	0.9820	
23	0.3880	0.01630	10	-26.561	1	0.0387	0.9890	
24	0.1350	0.09340	2	-20.649	0	0.0379	0.9920	
25	0.4000	0.24700	5	-18.249	0	0.0423	0.8180	
26	0.3200	0.02610	9	-37.242	0	0.0416	0.9840	
27	0.5900	0.33700	10	-15.261	1	0.0362	0.9860	
28	0.5060	0.08660	4	-21.128	0	0.0511	0.9940	
29	0.5740	0.67200	4	-6.853	0	0.0314	0.5820	
30	0.4290	0.53500	3	-11.043	1	0.0379	0.8150	
31	0.2480	0.29800	0	-15.661	0	0.0395	0.9570	
32	0.2840	0.18800	2	-14.688	0	0.0377	0.9520	
33	0.3880	0.12200	2	-22.312	1	0.0446	0.9520	
34	0.2650	0.08590	1	-24.191	0	0.0516	0.9920	
35	0.4910	0.14200	4	-17.265	1	0.0361	0.7640	
36	0.4330	0.25400	5	-11.984	1	0.0407	0.9460	
37	0.4610	0.86900	0	-3.728	0	0.0423	0.4160	
38	0.0877	0.03470	4	-21.488	0	0.0393	0.8690	
39	0.1390	0.04530	2	-28.891	1	0.0419	0.9830	
40	0.1510	0.00153	1	-45.393	0	0.0451	0.9930	
41	0.1990	0.08520	6	-26.533	0	0.0385	0.8740	
42	0.4240	0.00798	5	-28.345	0	0.0496	0.9960	
43	0.4740	0.07100	10	-21.860	1	0.0415	0.9730	

44	0.2820	0.02680	2	-28.481	1	0.0471	0.9940
45	0.4650	0.12800	9	-17.628	0	0.0519	0.9780

	instrumentalness	liveness	valence	tempo	type	\
0	0.89000	0.3140	0.6480	119.912	audio_features	
1	0.49800	0.2260	0.1850	100.927	audio_features	
2	0.61200	0.2990	0.5420	108.031	audio_features	
3	0.81400	0.0892	0.0777	151.932	audio_features	
4	0.93600	0.1000	0.1660	115.989	audio_features	
5	0.55400	0.0361	0.6840	161.116	audio_features	
6	0.80700	0.0838	0.6730	152.053	audio_features	
7	0.89500	0.1260	0.2080	145.260	audio_features	
8	0.87700	0.1060	0.2850	168.061	audio_features	
9	0.93100	0.5850	0.4820	134.992	audio_features	
10	0.91000	0.1410	0.4680	157.024	audio_features	
11	0.21500	0.1870	0.4550	123.138	audio_features	
12	0.50700	0.2550	0.3950	83.300	audio_features	
13	0.89200	0.2220	0.0463	119.331	audio_features	
14	0.86200	0.1300	0.1460	178.422	audio_features	
15	0.88100	0.0717	0.4490	151.328	audio_features	
16	0.12700	0.1330	0.5050	124.611	audio_features	
17	0.05230	0.3690	0.7070	113.325	audio_features	
18	0.89500	0.1040	0.1040	129.274	audio_features	
19	0.04600	0.0701	0.1480	128.754	audio_features	
20	0.08990	0.1150	0.3290	117.941	audio_features	
21	0.94500	0.0679	0.1010	134.839	audio_features	
22	0.00926	0.1140	0.7780	108.016	audio_features	
23	0.91800	0.1770	0.1040	94.445	audio_features	
24	0.73100	0.0744	0.0615	92.843	audio_features	
25	0.64000	0.1190	0.3940	162.078	audio_features	
26	0.92800	0.0749	0.1470	69.279	audio_features	
27	0.90000	0.0947	0.3940	108.326	audio_features	
28	0.92200	0.1050	0.2530	96.360	audio_features	
29	0.10800	0.3350	0.9270	137.356	audio_features	
30	0.93000	0.0759	0.9260	81.182	audio_features	
31	0.90000	0.0943	0.1570	97.853	audio_features	
32	0.85700	0.0658	0.1670	83.321	audio_features	
33	0.48000	0.0538	0.5910	153.204	audio_features	
34	0.89200	0.1060	0.1100	74.563	audio_features	
35	0.74000	0.2480	0.2340	112.295	audio_features	
36	0.80900	0.0988	0.1700	133.107	audio_features	
37	0.76500	0.2220	0.6630	161.974	audio_features	
38	0.83000	0.2340	0.0425	62.942	audio_features	
39	0.85700	0.1160	0.1520	91.172	audio_features	
40	0.91400	0.0711	0.1270	75.079	audio_features	
41	0.02190	0.2080	0.3500	185.570	audio_features	
42	0.92500	0.0983	0.0794	124.166	audio_features	
43	0.65200	0.0590	0.3250	89.991	audio_features	
44	0.92500	0.0737	0.0819	80.168	audio_features	
45	0.27100	0.0423	0.4280	111.471	audio_features	

	id	uri	\
0	3UA0F8MAYMPsgSn4MzoEMT	spotify:track:3UA0F8MAYMPsgSn4MzoEMT	
1	5asJWYUnkHSn6O5rLOrTSz	spotify:track:5asJWYUnkHSn6O5rLOrTSz	
2	4OxzJ3FcPM7sHfI6mmbdG1	spotify:track:4OxzJ3FcPM7sHfI6mmbdG1	
3	72RU0m9dX7t4vQRPwTDWcQ	spotify:track:72RU0m9dX7t4vQRPwTDWcQ	
4	3FT92lQ7y5LzT2QOlhuwTg	spotify:track:3FT92lQ7y5LzT2QOlhuwTg	

5	4z5NtNa8aaPpGvNwU3FA4Y	spotify:track:4z5NtNa8aaPpGvNwU3FA4Y	
6	1RecR1HrNXJMh3X2lR7cQt	spotify:track:1RecR1HrNXJMh3X2lR7cQt	
7	4KNPYAJXhU1x4z9LGpRA9l	spotify:track:4KNPYAJXhU1x4z9LGpRA9l	
8	1crphtLmE5qben7biopmp3	spotify:track:1crphtLmE5qben7biopmp3	
9	1UGHLUL5TRexb49XC5sw4I	spotify:track:1UGHLUL5TRexb49XC5sw4I	
10	1Ojz92vyPK4fJ5K8RVnV5u	spotify:track:1Ojz92vyPK4fJ5K8RVnV5u	
11	5JCzqqfUreBwpaVgoYqi7I	spotify:track:5JCzqqfUreBwpaVgoYqi7I	
12	4QVvs3p2RO35Qm1Lk7XanO	spotify:track:4QVvs3p2RO35Qm1Lk7XanO	
13	525HZpYpq9Pu1AIfuclL6n	spotify:track:525HZpYpq9Pu1AIfuclL6n	
14	5YeB1K9Aecnn4DECRwdqfk	spotify:track:5YeB1K9Aecnn4DECRwdqfk	
15	3bW9EZipr1lNRwFEKQPg2A	spotify:track:3bW9EZipr1lNRwFEKQPg2A	
16	279aYcgTTMetBKyMdlCJFN	spotify:track:279aYcgTTMetBKyMdlCJFN	
17	2Ji40kaDBUuWa0WOPX23eH	spotify:track:2Ji40kaDBUuWa0WOPX23eH	
18	6fwa94Wr5uAUUsL5CNcboh	spotify:track:6fwa94Wr5uAUUsL5CNcboh	
19	4I0Sr4J6M3Kpr0sSFicGIV	spotify:track:4I0Sr4J6M3Kpr0sSFicGIV	
20	48LZLWlKuyrcp4t0iQJeqd	spotify:track:48LZLWlKuyrcp4t0iQJeqd	
21	0H2VhGUC3P3hvwz8rdGIpC	spotify:track:0H2VhGUC3P3hvwz8rdGIpC	
22	0ICwxdyfqFcn8bYDAW0NJS	spotify:track:0ICwxdyfqFcn8bYDAW0NJS	
23	2FP7JttwbYPXcXxIihEvop	spotify:track:2FP7JttwbYPXcXxIihEvop	
24	25NKS4Vv5pIxfBPye964QD	spotify:track:25NKS4Vv5pIxfBPye964QD	
25	0ROMalDdNg3L2HoZP4qFyJ	spotify:track:0ROMalDdNg3L2HoZP4qFyJ	
26	2hIPKpN0XNaCcy2gxd9OIg	spotify:track:2hIPKpN0XNaCcy2gxd9OIg	
27	4Jha1ZUIC012EmLyod413r	spotify:track:4Jha1ZUIC012EmLyod413r	
28	2vID5cWlYY07NOuWdDb5zw	spotify:track:2vID5cWlYY07NOuWdDb5zw	
29	0WZ6z2qeQ4o1O3bSoDDLyJ	spotify:track:0WZ6z2qeQ4o1O3bSoDDLyJ	
30	1ntwYN2nT0Dl3c8lne15ii	spotify:track:1ntwYN2nT0Dl3c8lne15ii	
31	6cUCckpdlqHJ5Ascf2uH2A	spotify:track:6cUCckpdlqHJ5Ascf2uH2A	
32	3HifyVE7xq0su2F6Hz7ie6	spotify:track:3HifyVE7xq0su2F6Hz7ie6	
33	4ySqdQH0bhSzuGbBjeJrQm	spotify:track:4ySqdQH0bhSzuGbBjeJrQm	
34	1SryZ16iuLbxe6Nv58VgVG	spotify:track:1SryZ16iuLbxe6Nv58VgVG	
35	4jOlYUMMsCacMm3xcrYRLl	spotify:track:4jOlYUMMsCacMm3xcrYRLl	
36	6GBJmYvJKsD17oOsQjuwBz	spotify:track:6GBJmYvJKsD17oOsQjuwBz	
37	3DHluFWhBTsycguvmfh1r6	spotify:track:3DHluFWhBTsycguvmfh1r6	
38	0ZvA8I786UwUobrEmidYlt	spotify:track:0ZvA8I786UwUobrEmidYlt	
39	1wMeERi15mwVn6FfjZmEyP	spotify:track:1wMeERi15mwVn6FfjZmEyP	
40	6onVtBLxZpq4cwMa3fUMJs	spotify:track:6onVtBLxZpq4cwMa3fUMJs	
41	7lmhOEq3UJGm9LOgjbdbWm	spotify:track:7lmhOEq3UJGm9LOgjbdbWm	
42	4820SC1xnUaabzzYQTDkP2	spotify:track:4820SC1xnUaabzzYQTDkP2	
43	1P0E20dEiQOj5ql6WGHzyk	spotify:track:1P0E20dEiQOj5ql6WGHzyk	
44	4MFHVdS8rsw1rSTZGWhCa8	spotify:track:4MFHVdS8rsw1rSTZGWhCa8	
45	6cC6h5E351deEGFd7Kh9uy	spotify:track:6cC6h5E351deEGFd7Kh9uy	

	track_href \
0	https://api.spotify.com/v1/tracks/3UA0F8MAYMPs...
1	https://api.spotify.com/v1/tracks/5asJWYUnkHSn...
2	https://api.spotify.com/v1/tracks/4OxzJ3FcPM7s...
3	https://api.spotify.com/v1/tracks/72RU0m9dX7t4...
4	https://api.spotify.com/v1/tracks/3FT92lQ7y5Lz...
5	https://api.spotify.com/v1/tracks/4z5NtNa8aaPp...
6	https://api.spotify.com/v1/tracks/1RecR1HrNXJM...
7	https://api.spotify.com/v1/tracks/4KNPYAJXhU1x...
8	https://api.spotify.com/v1/tracks/1crphtLmE5qb...
9	https://api.spotify.com/v1/tracks/1UGHLUL5TRex...
10	https://api.spotify.com/v1/tracks/1Ojz92vyPK4f...
11	https://api.spotify.com/v1/tracks/5JCzqqfUreBw...
12	https://api.spotify.com/v1/tracks/4QVvs3p2RO35...
13	https://api.spotify.com/v1/tracks/525HZpYpq9Pu...

14	https://api.spotify.com/v1/tracks/5YeB1K9Aecnn...
15	https://api.spotify.com/v1/tracks/3bW9EZipr1lN...
16	https://api.spotify.com/v1/tracks/279aYcgTTMet...
17	https://api.spotify.com/v1/tracks/2Ji40kaDBUuW...
18	https://api.spotify.com/v1/tracks/6fwa94Wr5uAU...
19	https://api.spotify.com/v1/tracks/4I0Sr4J6M3Kp...
20	https://api.spotify.com/v1/tracks/48LZLWlKuyrc...
21	https://api.spotify.com/v1/tracks/0H2VhGUC3P3h...
22	https://api.spotify.com/v1/tracks/0ICwxdyfqFcn...
23	https://api.spotify.com/v1/tracks/2FP7JttwbYPX...
24	https://api.spotify.com/v1/tracks/25NKS4Vv5pIx...
25	https://api.spotify.com/v1/tracks/0ROMalDdNg3L...
26	https://api.spotify.com/v1/tracks/2hIPKpN0XNaC...
27	https://api.spotify.com/v1/tracks/4Jha1ZUIC012...
28	https://api.spotify.com/v1/tracks/2vID5cWlYY07...
29	https://api.spotify.com/v1/tracks/0WZ6z2qeQ4o1...
30	https://api.spotify.com/v1/tracks/1ntwYN2nT0Dl...
31	https://api.spotify.com/v1/tracks/6cUCckpdlqHJ...
32	https://api.spotify.com/v1/tracks/3HifyVE7xq0s...
33	https://api.spotify.com/v1/tracks/4ySqdQH0bhSz...
34	https://api.spotify.com/v1/tracks/1SryZ16iuLbx...
35	https://api.spotify.com/v1/tracks/4jOlYUMMsCac...
36	https://api.spotify.com/v1/tracks/6GBJmYvJKsD1...
37	https://api.spotify.com/v1/tracks/3DHluFWhBTsy...
38	https://api.spotify.com/v1/tracks/0ZvA8I786UwU...
39	https://api.spotify.com/v1/tracks/1wMeERi15mwV...
40	https://api.spotify.com/v1/tracks/6onVtBLxZpq4...
41	https://api.spotify.com/v1/tracks/7lmhOEq3UJGm...
42	https://api.spotify.com/v1/tracks/4820SC1xnUaa...
43	https://api.spotify.com/v1/tracks/1P0E20dEiQOj...
44	https://api.spotify.com/v1/tracks/4MFHVdS8rsw1...
45	https://api.spotify.com/v1/tracks/6cC6h5E351de...

	analysis_url	duration_ms	\
0	https://api.spotify.com/v1/audio-analysis/3UA0...	228827	
1	https://api.spotify.com/v1/audio-analysis/5asJ...	194387	
2	https://api.spotify.com/v1/audio-analysis/4Oxz...	172147	
3	https://api.spotify.com/v1/audio-analysis/72RU...	199482	
4	https://api.spotify.com/v1/audio-analysis/3FT9...	247600	
5	https://api.spotify.com/v1/audio-analysis/4z5N...	174708	
6	https://api.spotify.com/v1/audio-analysis/1Rec...	156007	
7	https://api.spotify.com/v1/audio-analysis/4KNP...	295480	
8	https://api.spotify.com/v1/audio-analysis/1crp...	186427	
9	https://api.spotify.com/v1/audio-analysis/1UGH...	186067	
10	https://api.spotify.com/v1/audio-analysis/1Ojz...	167880	
11	https://api.spotify.com/v1/audio-analysis/5JCz...	614333	
12	https://api.spotify.com/v1/audio-analysis/4QVv...	84267	
13	https://api.spotify.com/v1/audio-analysis/525H...	497922	
14	https://api.spotify.com/v1/audio-analysis/5YeB...	218276	
15	https://api.spotify.com/v1/audio-analysis/3bW9...	111299	
16	https://api.spotify.com/v1/audio-analysis/279a...	123027	
17	https://api.spotify.com/v1/audio-analysis/2Ji4...	153067	
18	https://api.spotify.com/v1/audio-analysis/6fwa...	103120	
19	https://api.spotify.com/v1/audio-analysis/4I0S...	359533	
20	https://api.spotify.com/v1/audio-analysis/48LZ...	485367	
21	https://api.spotify.com/v1/audio-analysis/0H2V...	203656	
22	https://api.spotify.com/v1/audio-analysis/0ICw...	131000	

23	https://api.spotify.com/v1/audio-analysis/2FP7...	274040	
24	https://api.spotify.com/v1/audio-analysis/25NK...	257160	
25	https://api.spotify.com/v1/audio-analysis/0ROM...	201853	
26	https://api.spotify.com/v1/audio-analysis/2hIP...	132667	
27	https://api.spotify.com/v1/audio-analysis/4Jha...	125639	
28	https://api.spotify.com/v1/audio-analysis/2vID...	123670	
29	https://api.spotify.com/v1/audio-analysis/0WZ6...	114613	
30	https://api.spotify.com/v1/audio-analysis/1ntw...	131599	
31	https://api.spotify.com/v1/audio-analysis/6cUC...	442000	
32	https://api.spotify.com/v1/audio-analysis/3Hif...	811907	
33	https://api.spotify.com/v1/audio-analysis/4ySq...	211600	
34	https://api.spotify.com/v1/audio-analysis/1Sry...	462533	
35	https://api.spotify.com/v1/audio-analysis/4jOl...	202387	
36	https://api.spotify.com/v1/audio-analysis/6GBJ...	283760	
37	https://api.spotify.com/v1/audio-analysis/3DHl...	158680	
38	https://api.spotify.com/v1/audio-analysis/0ZvA...	202000	
39	https://api.spotify.com/v1/audio-analysis/1wMe...	227373	
40	https://api.spotify.com/v1/audio-analysis/6onV...	328000	
41	https://api.spotify.com/v1/audio-analysis/7lmh...	198680	
42	https://api.spotify.com/v1/audio-analysis/4820...	214133	
43	https://api.spotify.com/v1/audio-analysis/1P0E...	545587	
44	https://api.spotify.com/v1/audio-analysis/4MFH...	738827	
45	https://api.spotify.com/v1/audio-analysis/6cC6...	268853	

	time_signature	track_name \
0	4	Master Of Puppets
1	4	Stairway To Heaven
2	4	Eye Of The Tiger
3	4	Swan Lake Theme
4	4	Smells Like Teen Spirit
5	4	We Will Rock You
6	4	A La Turca
7	4	Bohemian Rhapsody
8	4	Lose Yourself
9	4	Thunderstruck
10	3	The Four Seasons: Concerto No. 2 in G Minor, R...
11	4	Violin Concerto in D, Op.61: 3. Rondo (Allegro)
12	4	Flight of the Bumblebee
13	3	Yerevan Etudes, Op. 30: I. Enzeli
14	4	Yerevan Etudes, Op. 30: II. Gedzhas
15	3	La Donna E Mobile
16	4	Carmen Suite No. 2: Habanera. Allegretto quasi...
17	4	Carmen Suite No. 1: Les Toréadors. Allegro gio...
18	4	Dance of the Sugar Plum Fairy - Andante non tr...
19	4	Coronation Anthem No. 1, HWV 258: 1. Zadok the...
20	4	Beethoven: String Quartet No. 7 in F Major, Op...
21	5	Bagatelle No. 25 in A Minor, WoO 59 "Für Elise"
22	4	Violin Sonata in G Major, K301 Movement 2
23	3	3 Nocturnes, Op. 9: II. Andante
24	4	Mozart: Requiem in D Minor, K. 626: I. Introitus
25	4	The Four Seasons: Concerto No. 4 in F Minor, R...
26	4	Waltz No. 19 in A minor, Op. posth.
27	4	Turkish March, Op. 113 No. 4
28	3	Greensleeves
29	4	Katjuscha
30	4	Can Can
31	4	Symphony No. 5 in C Minor, Op. 67: I. Allegro ...

32	4	Symphony No. 9 in D Minor, Op. 125 "Choral": I...
33	3	Beethoven: Symphony No. 2 in D Major, Op. 36: ...
34	4	Piano Sonata No. 14 in C-Sharp Minor, Op. 27 N...
35	4	The Four Seasons: Concerto No. 1 in E Major, R...
36	4	L'Autunno (Autumn) Op. 8 No. 3 in F major: I. ...
37	3	Summer
38	4	Symphony No.7 in A, Op.92 : 2. Allegretto
39	4	Suite No.3 in D, BWV 1068 : Air on the G string
40	3	Moonlight Sonata: Adagio Sostenuto
41	3	Karaindrou: To Vals Tou Gamou
42	3	Gnossienne: No. 1
43	4	Piano Trio No. 1 in B-Flat Major, D. 898: IV. ...
44	3	Piano Sonata in D Major, Op. 28 - 'Pastoral': ...
45	4	Paganini: 24 Caprices, Op. 1: No. 24 in A Minor

	popularity
0	29
1	38
2	37
3	35
4	33
5	29
6	37
7	34
8	49
9	24
10	67
11	0
12	33
13	0
14	0
15	15
16	43
17	23
18	42
19	5
20	32
21	58
22	21
23	56
24	31
25	67
26	1
27	42
28	27
29	37
30	55
31	1
32	43
33	49
34	28
35	53
36	26
37	27
38	0
39	0
40	0

41 48
42 64
43 18
44 29
45 59

Predicting Popularity of Tracks

Here I applied a machine learning technique to predict the popularity of tracks based on their audio features using a Linear Regression model. A Linear Regression model is instantiated and trained on the training dataset. The purpose of this is to create a predictive model that can estimate how popular a song might be based on its audio features. This could help us to understand which attributes of a song contribute most to its popularity and potentially guide you in discovering or creating new playlists that align with popular music trends.

"X_train" represents the feature variables (independent variables) that are used to train my predictive model. It contains a subset of my dataset, usually a majority of the data, and includes the feature values (attributes) for each data point. Each row in X_train corresponds to a data point (observation), and each column represents a different feature or attribute.

"y_train" represents the target variable (dependent variable) that I am are trying to predict or model. It also contains a subset of your dataset, corresponding to the same data points as in X_train.

"X_test" represents another subset of my dataset that is distinct from the training data. It contains feature variables similar to X_train, but these data points are reserved for testing the model's performance. The model does not see these data points during training and uses them for evaluation.

"y_test" corresponds to the target variable for the data points in X_test. It contains the actual target values for the data points in the testing set, allowing me to compare the model's predictions with the real values for evaluation.

In summary, these variables are used to split my dataset into two parts: one for training the predictive model (X_train and y_train) and another for evaluating the model's performance (X_test and y_test). This separation helps assess how well the model generalizes to unseen data by comparing its predictions (on X_test) to the actual values (y_test).

The MSE measures the average squared difference between the actual 'popularity' values (y_test) and the predicted values (y_pred) made by my model.

X_train shape: (32, 13)
y_train shape: (32,)
X_test shape: (14, 13)
y_test shape: (14,)
Model Error (Mean Squared Error): 869.0860145468332

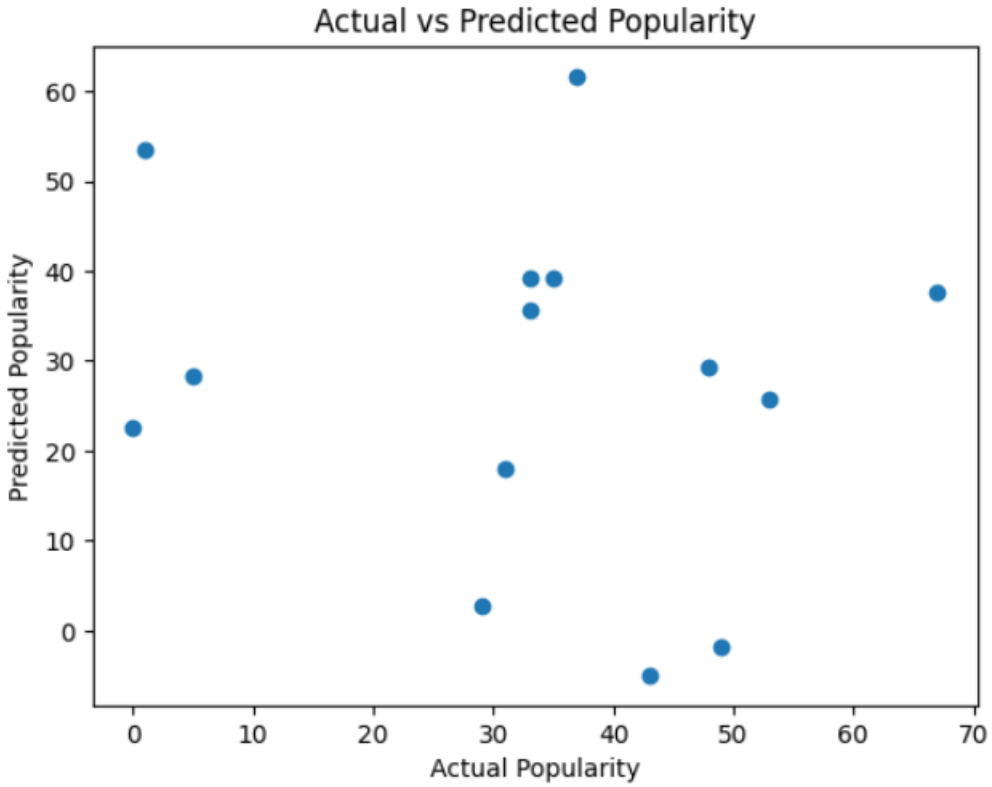
Actual and Predicted Popularity

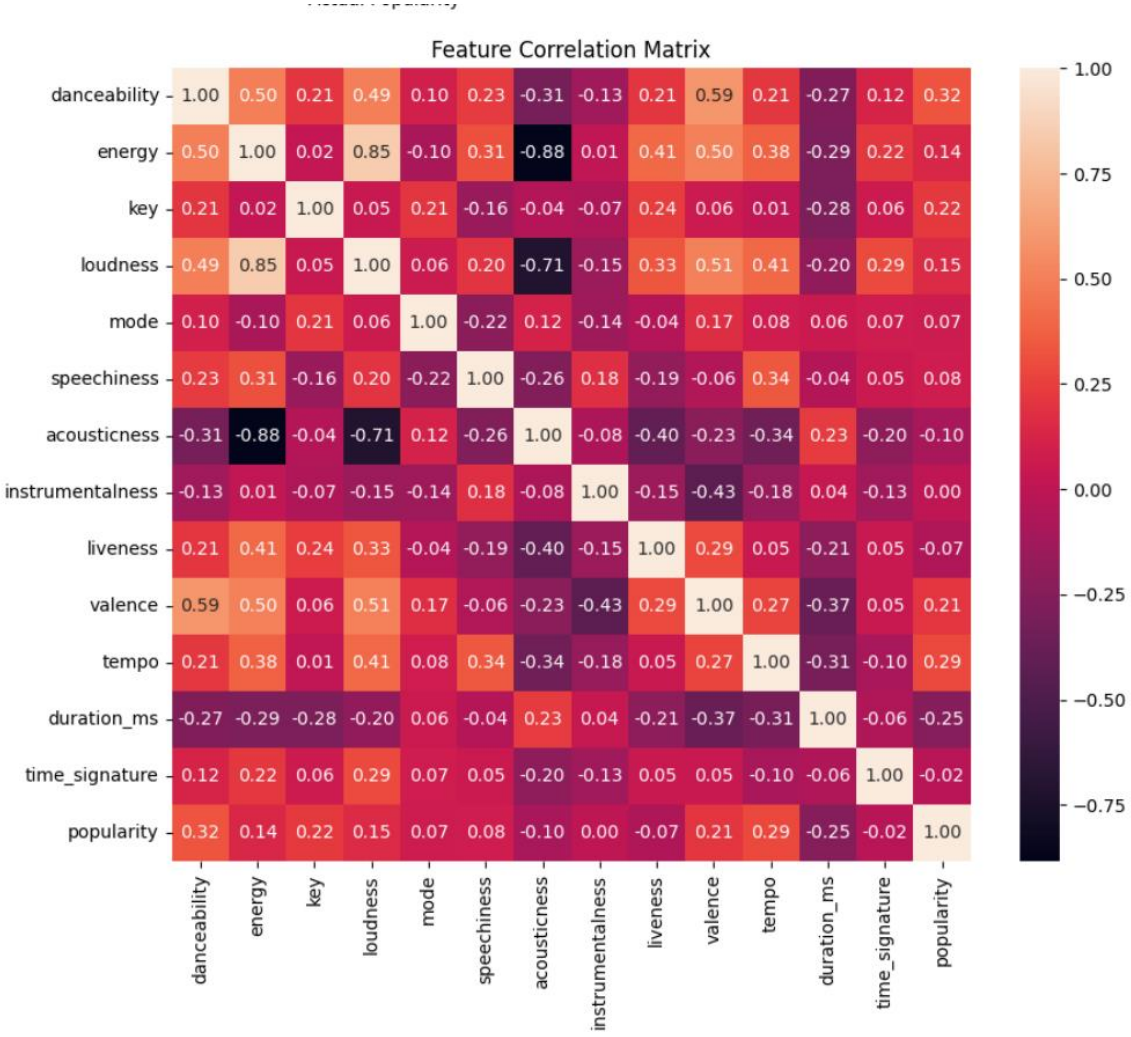
This section creates a scatter plot to compare actual popularity scores (from your Spotify data) against predicted popularity scores (obtained from the previous predictive model). It plots each actual popularity score (y_test) against its corresponding predicted score (y_pred). This visualization helps in assessing how

well my predictive model is performing. Points closer to a diagonal line would indicate better prediction accuracy.

Second part is a heatmap to display the correlation between different features in my dataset. This heatmap is useful for understanding the relationships between different features, which can inform feature selection or engineering in predictive modeling.

The purpose of this part is to visualize and analyze the data and the performance of my predictive model, specifically focusing on predicting the popularity of songs or artists based on my Spotify data. It's an integral part of the exploratory data analysis and model evaluation process in my project.





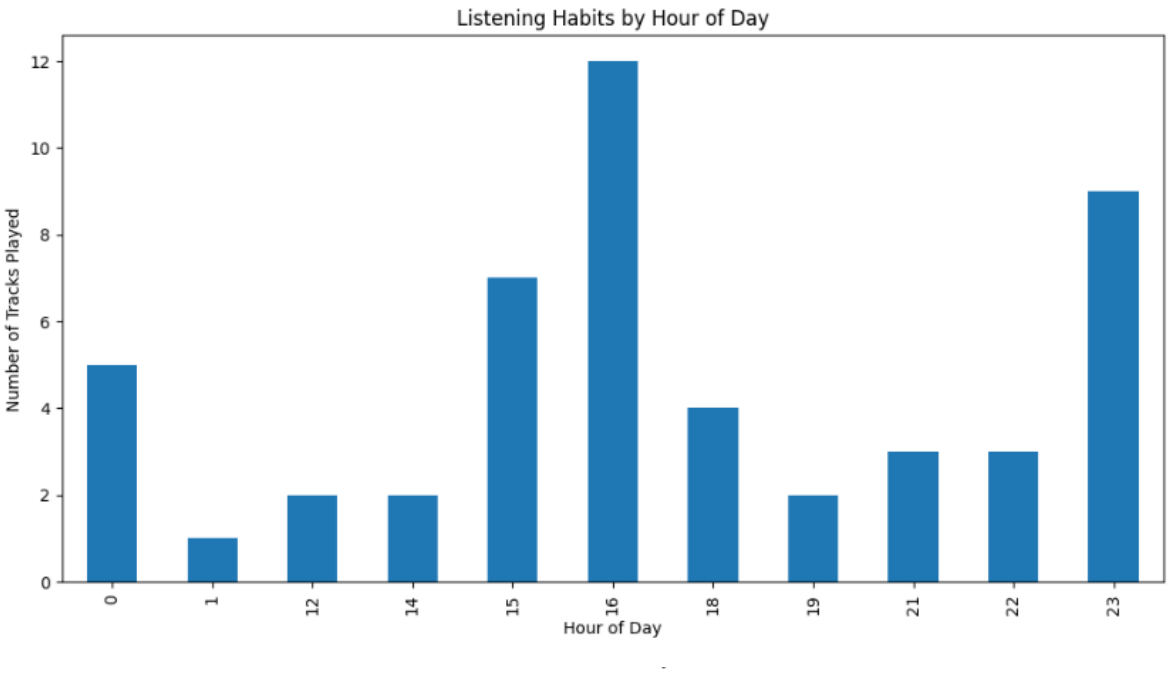
My Listening Habits

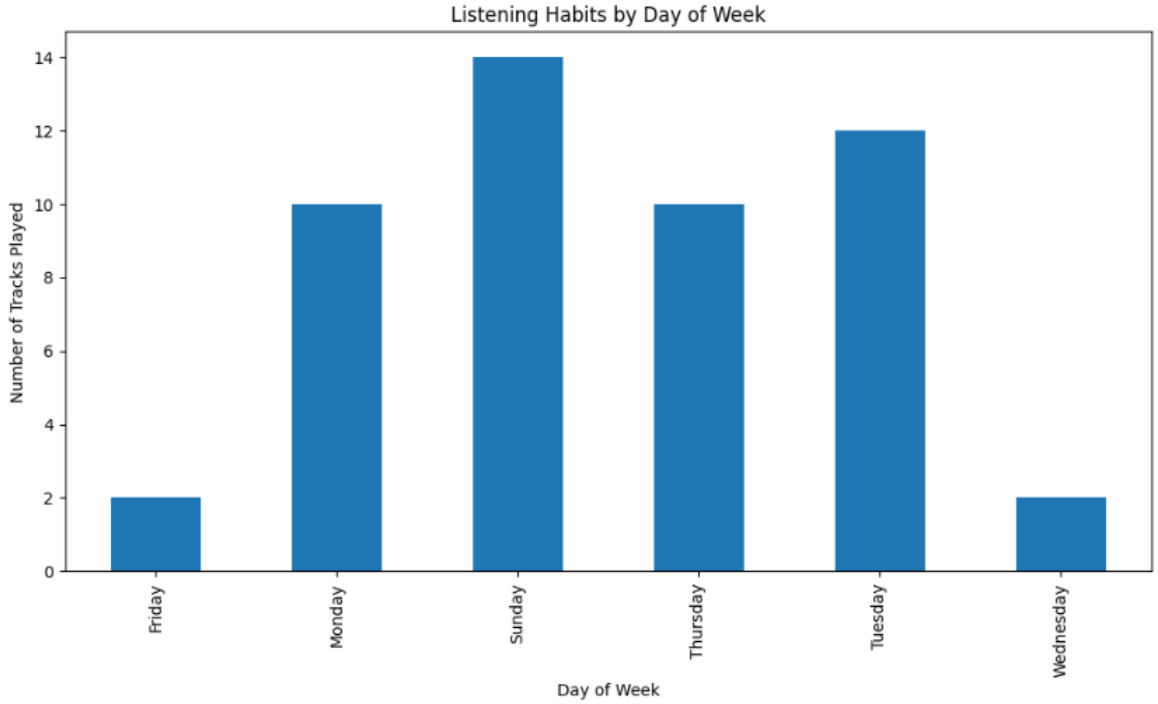
I am analyzing my Spotify listening habits. I have extracted specific components like the hour of the day, day of the week, and month from my data then group and count the tracks based on these time components, allowing me to analyze my listening habits across different time frames (hour, day, month).

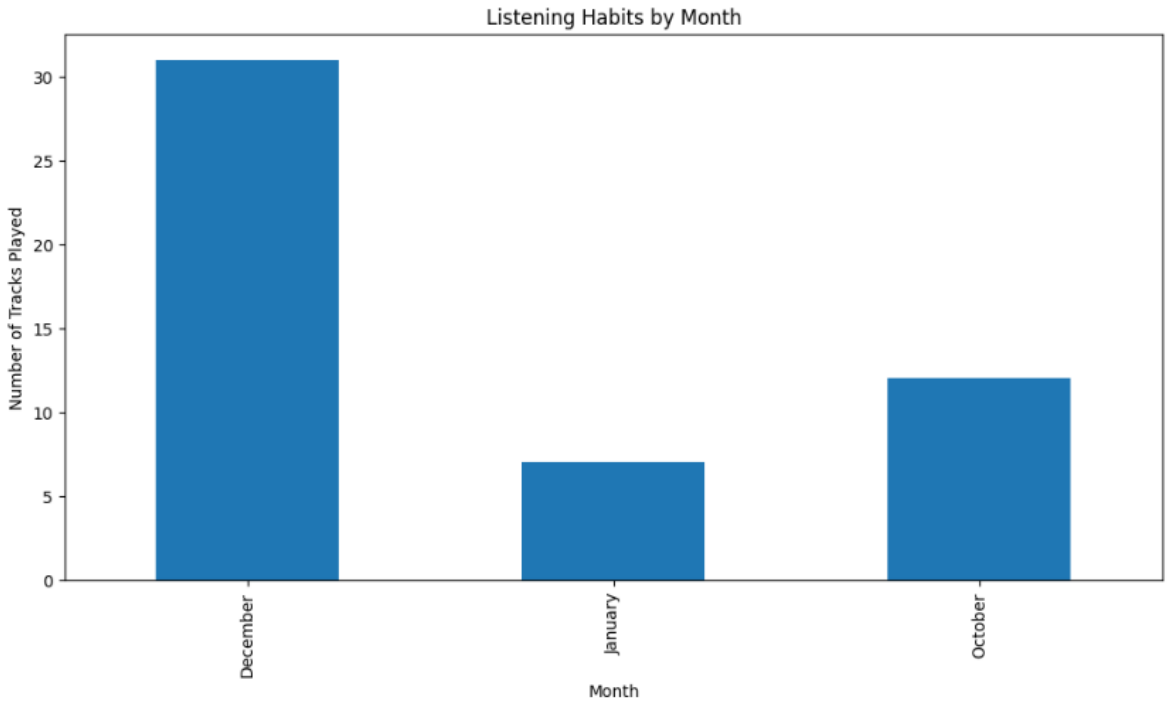
The analysis results are visualized using bar charts, showing the number of tracks played at different hours of the day, on different days of the week, and in different months (if applicable).

These visualizations help in understanding patterns in my listening habits, like what time of day I listen to music the most or which days of the week I am more likely to listen to music.

The purpose of this part is to gain insights into my personal Spotify listening habits, understanding patterns and preferences in my music consumption over time. This can be useful for potentially informing recommendations or further music exploration.

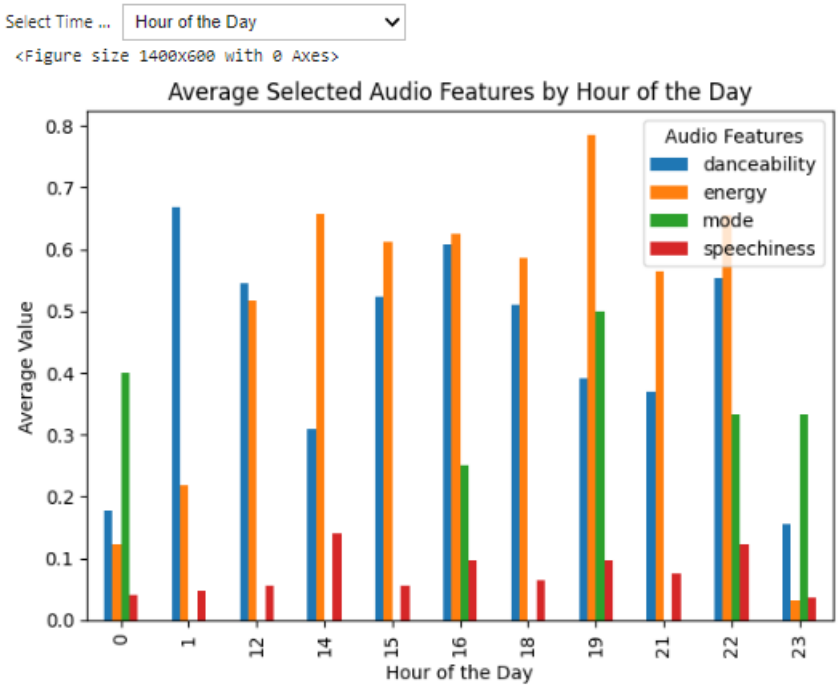

Listening Habits by Hour of Day
Number of Tracks Played
0
2
4
6
8
10
12
0
1
12
14
15
16
18
19
21
22
23
Hour of Day


Listening Habits by Day of Week
Number of Tracks Played
0
2
4
6
8
10
12
14
Friday
Monday
Sunday
Thursday
Tuesday
Wednesday
Day of Week



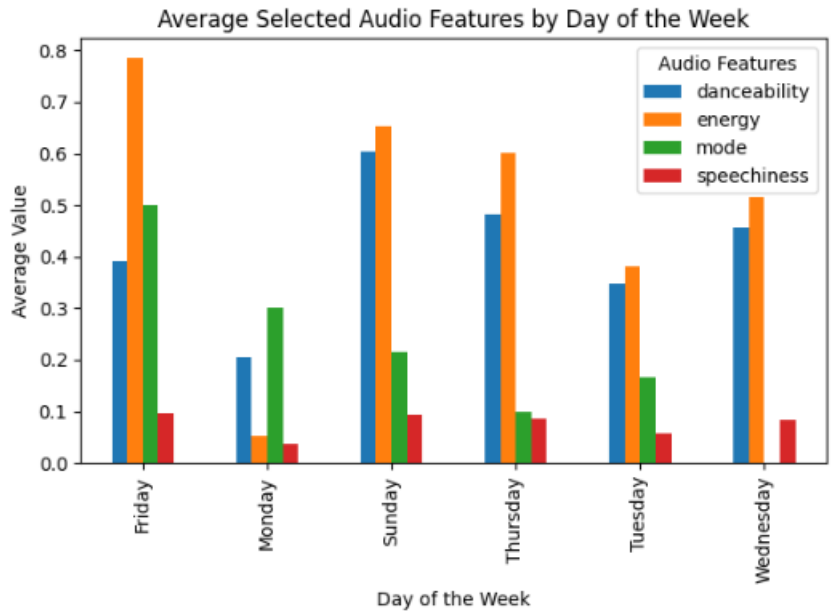
Analyzing My Mood Through Songs

In this part, I am utilizing my Spotipy data to perform a more detailed analysis of my Spotify listening habits, focusing on the audio features of the tracks that I have listened to. The purpose of this is to delve deeper into my music listening patterns, specifically by analyzing the characteristics of the music (like danceability, energy, etc.) across different times. This kind of analysis can provide insights into my music preferences and how they change over time or in different contexts. It's a more nuanced approach to understanding music listening behavior compared to just looking at track names or artists. It allows me to analize my mood over time and what kind of music that I listen based on my mood.



Select Time ... Day of the Week

```
<Figure size 1400x600 with 0 Axes>
```



Select Time ... Month

```
<Figure size 1400x600 with 0 Axes>
```