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.

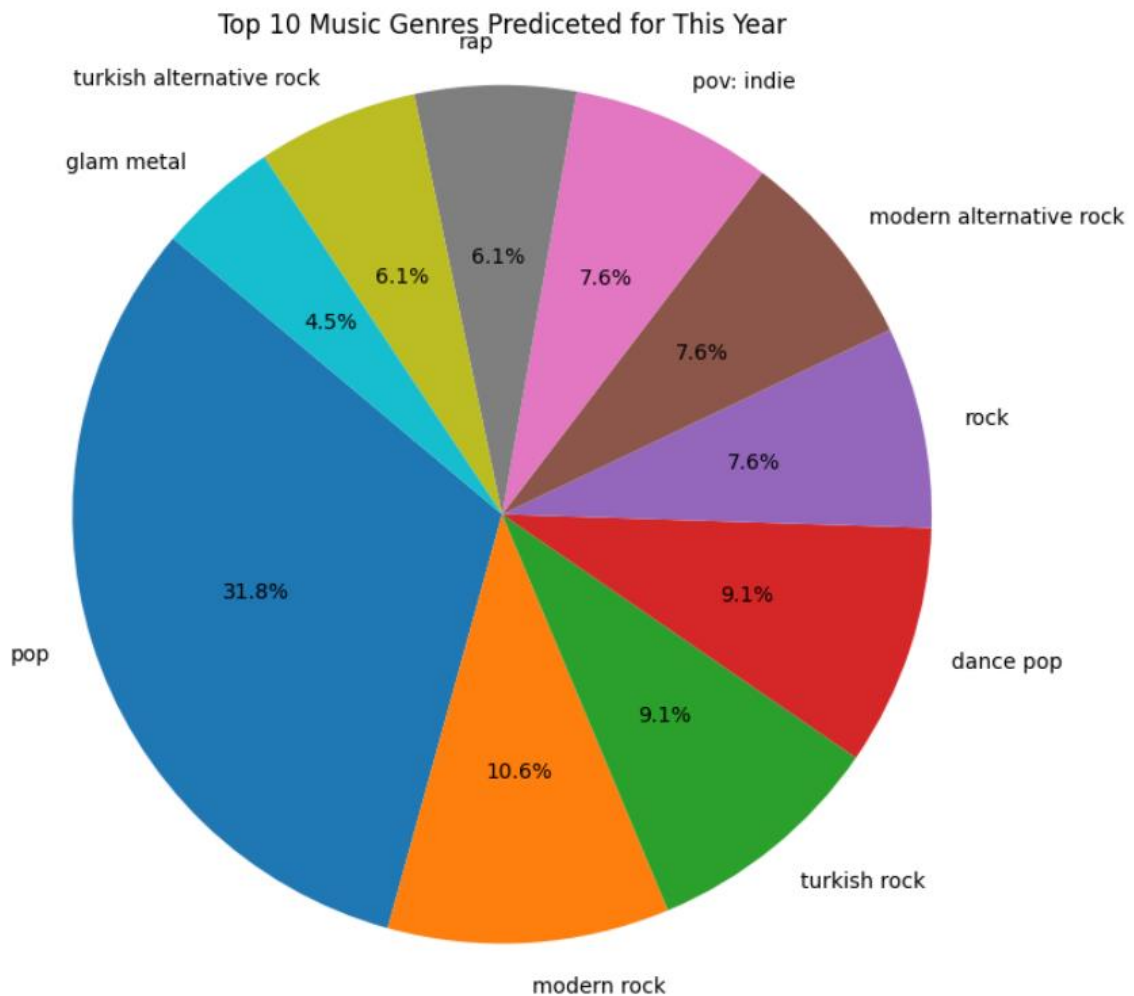# Understanding the purpose

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.

Top 10 Music Genres Prediceted for This Year

- turkish alternative rock
- rap
- pov: indie
- glam metal
- modern alternative rock — 7.6%
- rock — 7.6%
- 6.1%
- 6.1%
- 4.5%
- 7.6%
- dance pop — 9.1%
- 31.8%
- pop
- turkish rock — 9.1%
- 10.6%
- modern rock

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

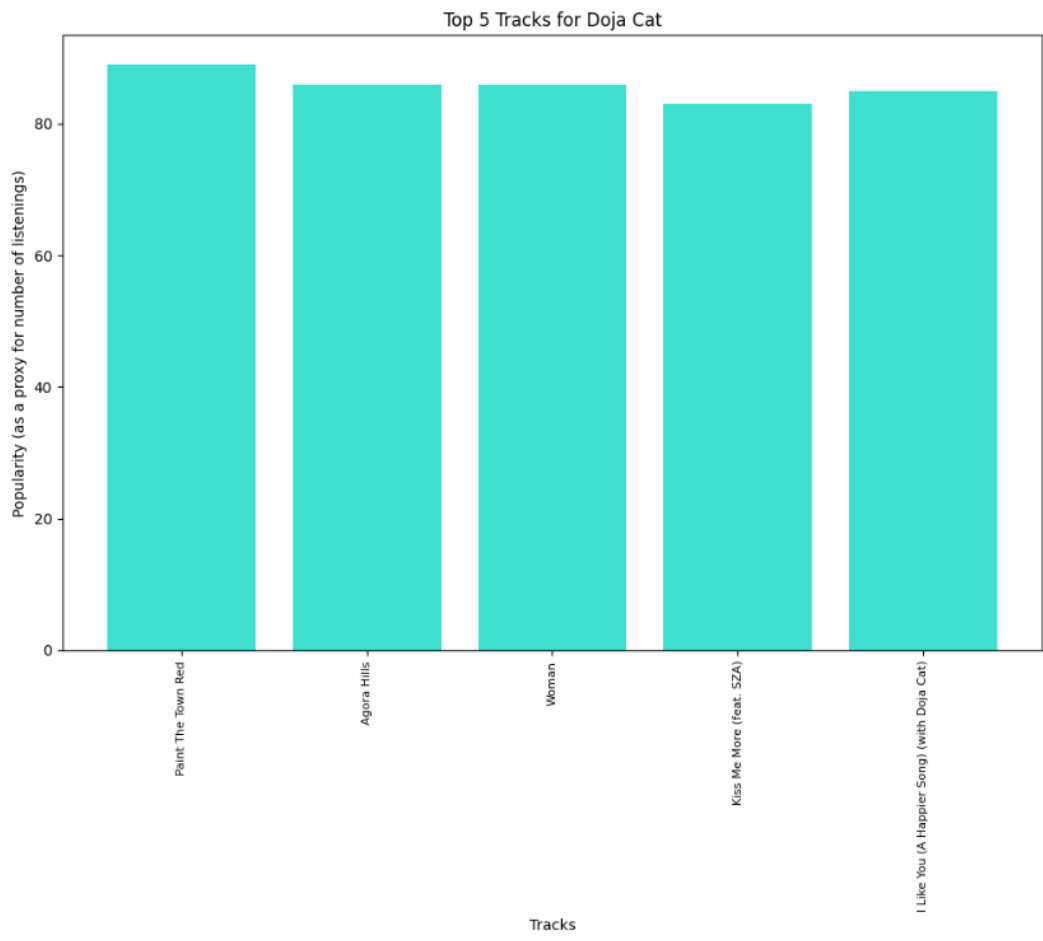Track: I Bet on Losing Dogs, Artists: Mitski

Track: Heal, Artists: Tom Odell

Track: Afraid, Artists: The Neighbourhood
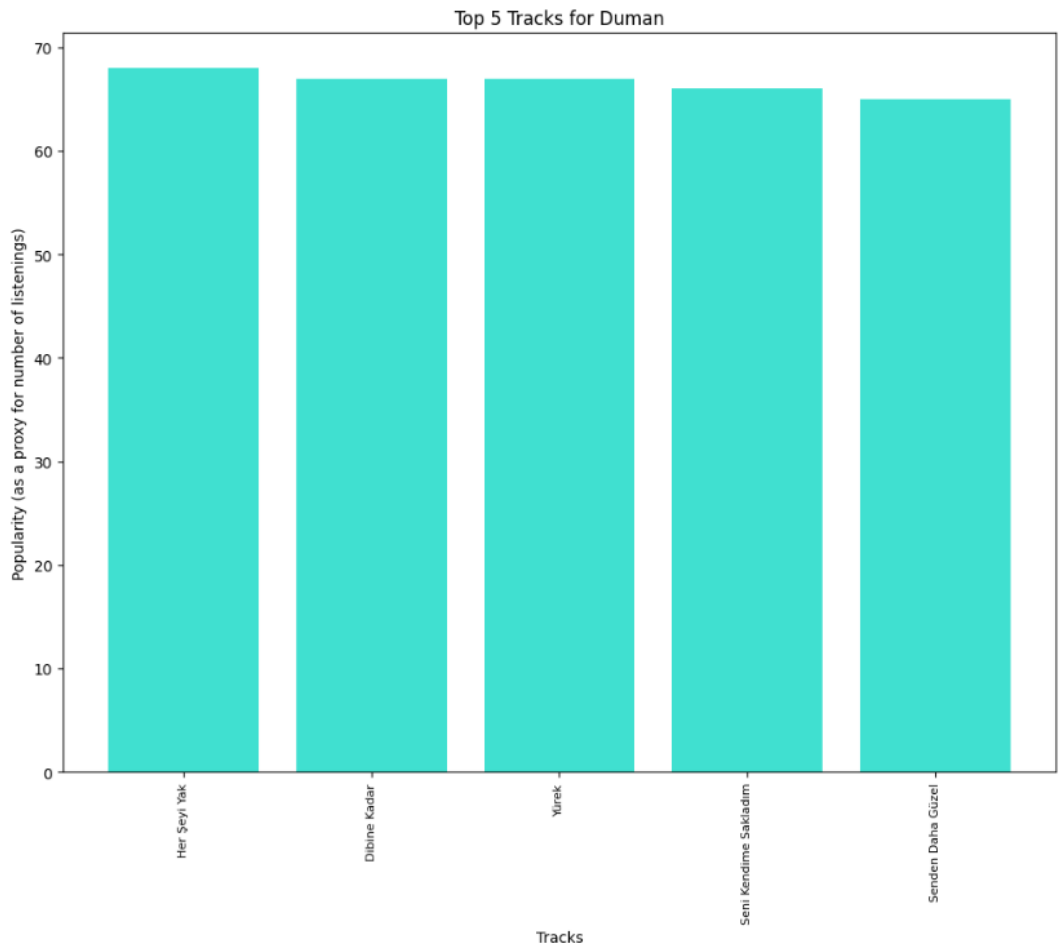
Track: Here, Artists: Alessia Cara
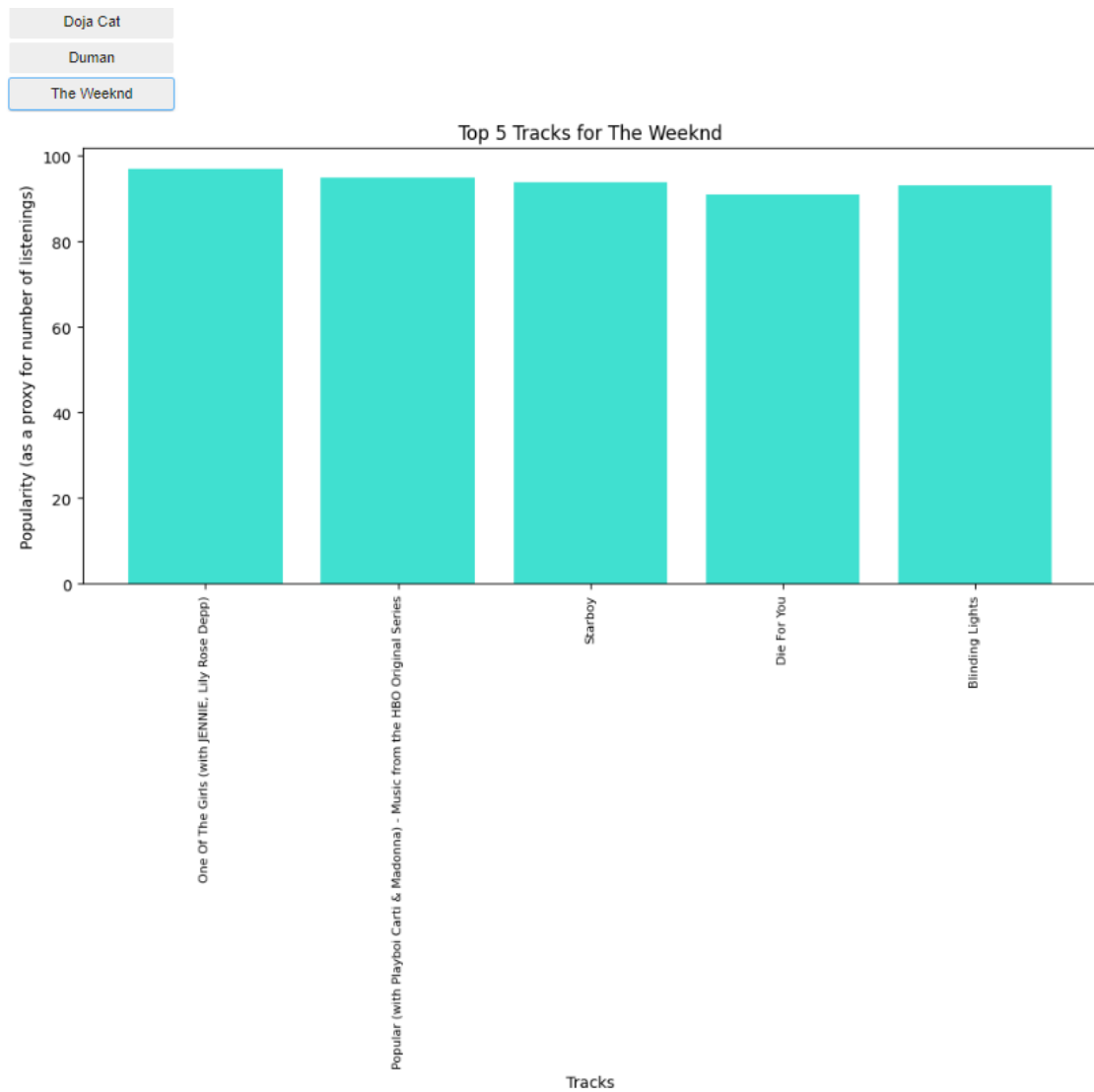
My Top Artists' Top Songs

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.

Top 5 Tracks for Doja Cat

Popularity (as a proxy for number of listenings)

Tracks

Paint The Town Red

Agora Hills

Woman

Kiss Me More (feat. SZA)

I Like You (A Happier Song) (with Doja Cat)

Doja Cat

Duman

The Weeknd

Top 5 Tracks for Duman

Popularity (as a proxy for number of listenings)

Tracks: Her Şeyi Yak, Dibine Kadar, Yürek, Seni Kendime Sakladım, Senden Daha Güzel

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.
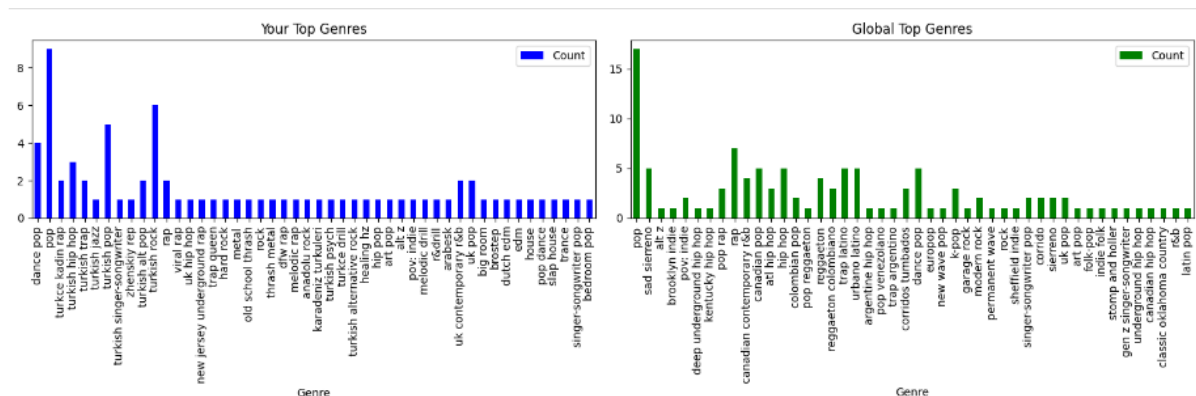
Correlation on My Top and Global Genres

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.
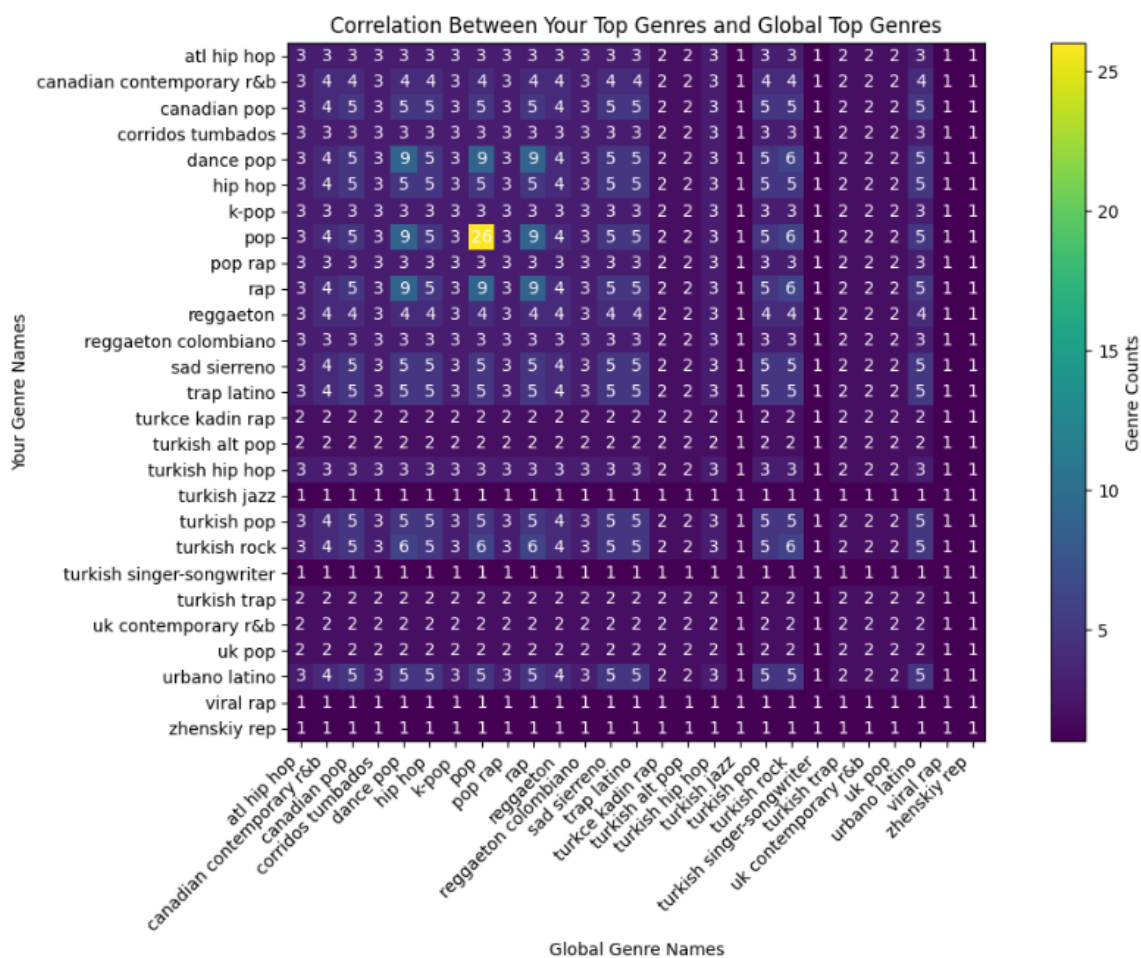
My Top Genres in Different Terms

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]:
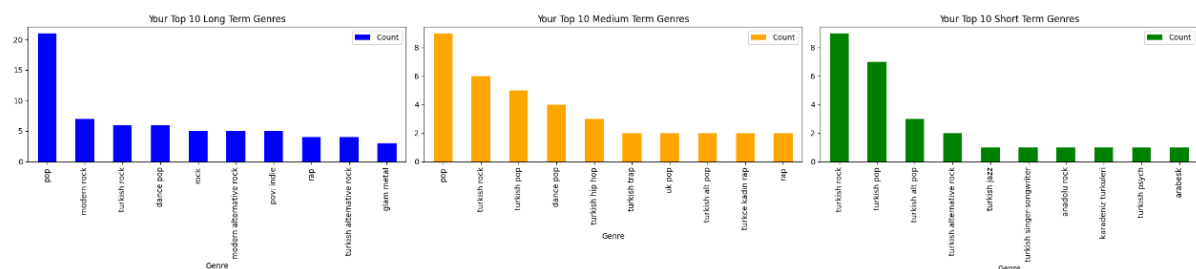
Changes in My Genres

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.

Genre Popularity Over Time
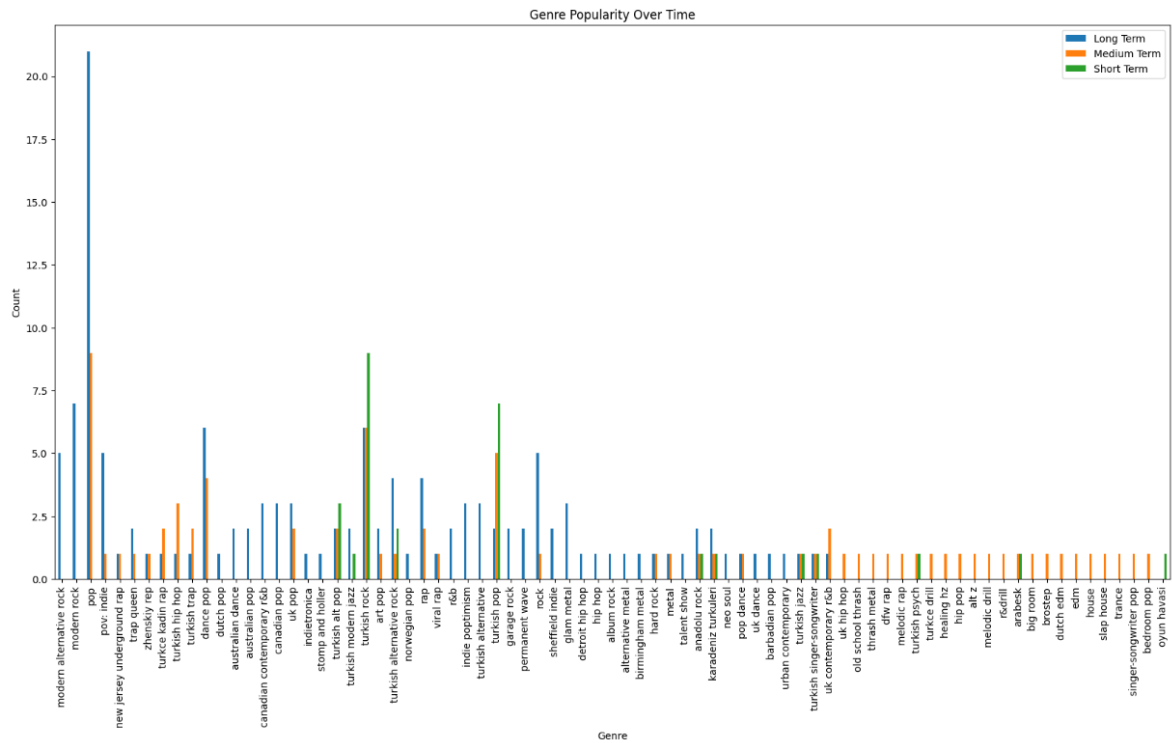
```
                             Long Term  Medium Term  Short Term  Trending Up  \
modern alternative rock              5            0           0        False
modern rock                          7            0           0        False
pop                                 21            9           0        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/25NKS4Vv5plx...
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/2vlD5cWlYY07...
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.

Feature Correlation Matrix
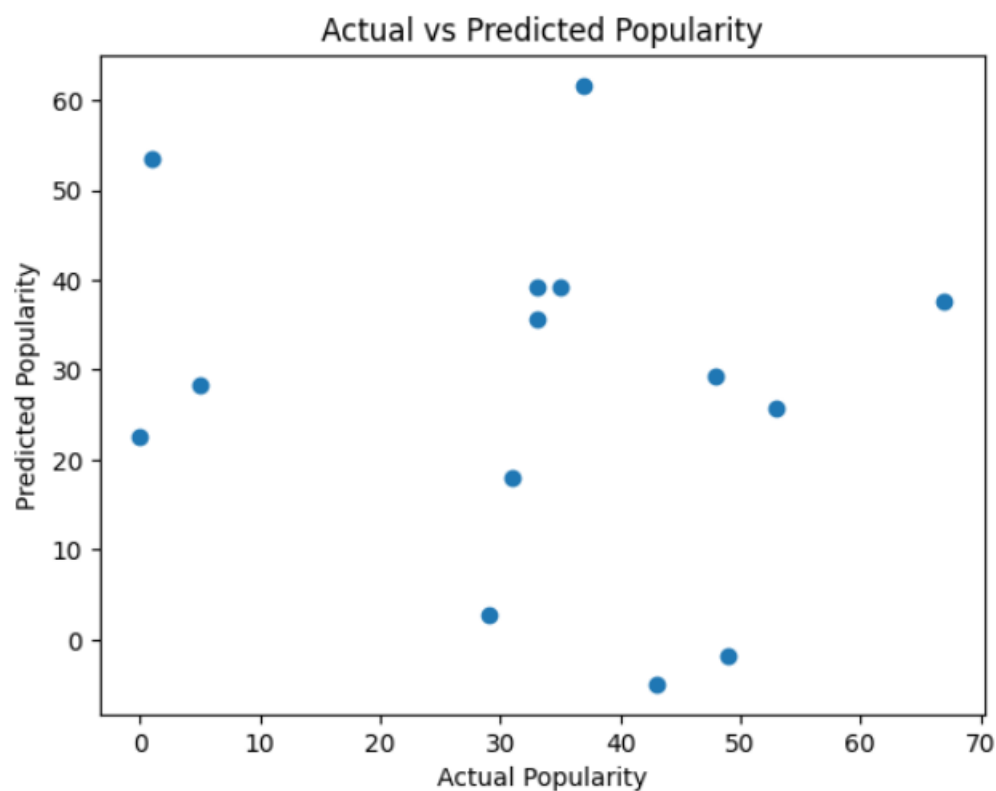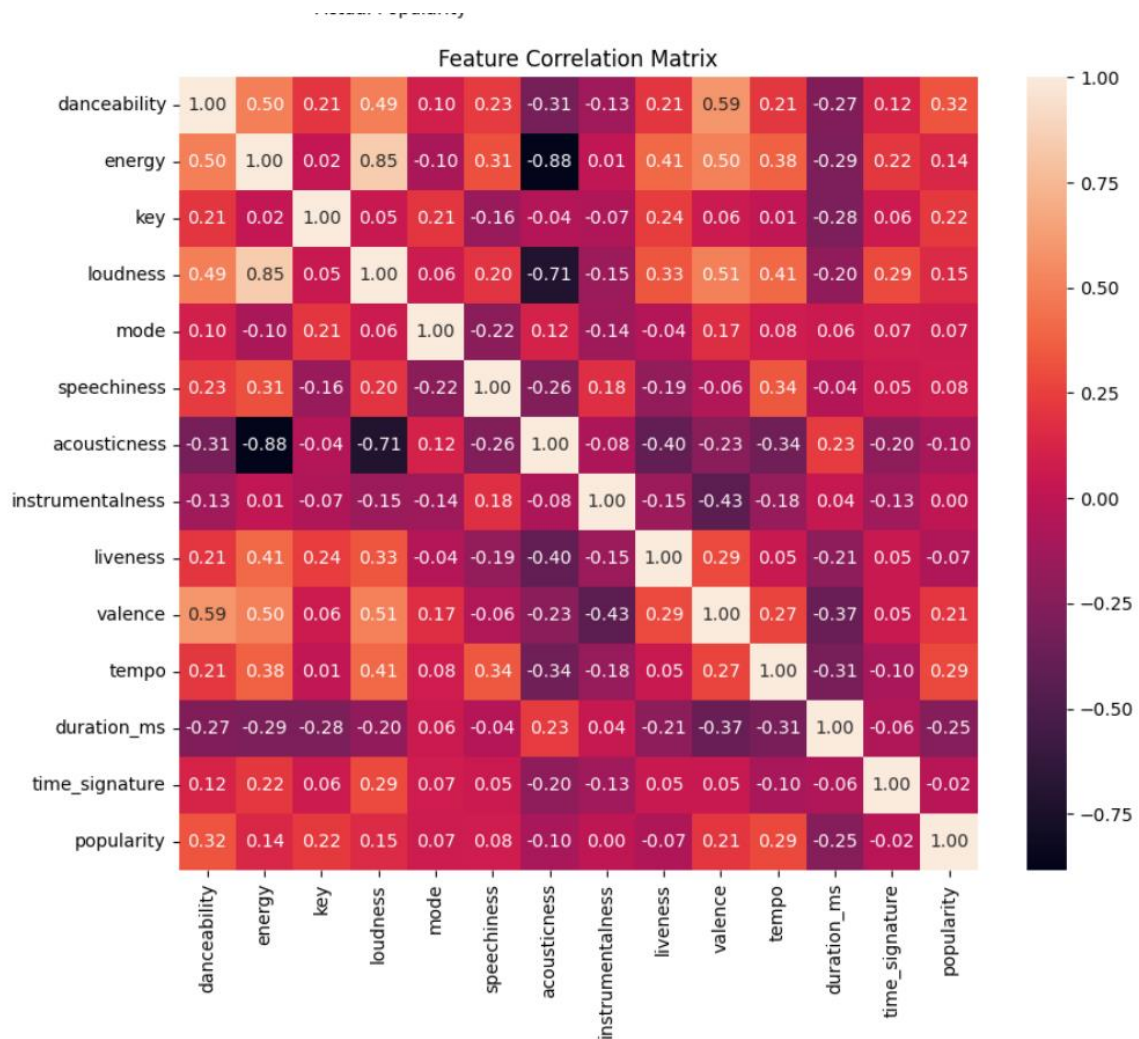
My Listening Habits

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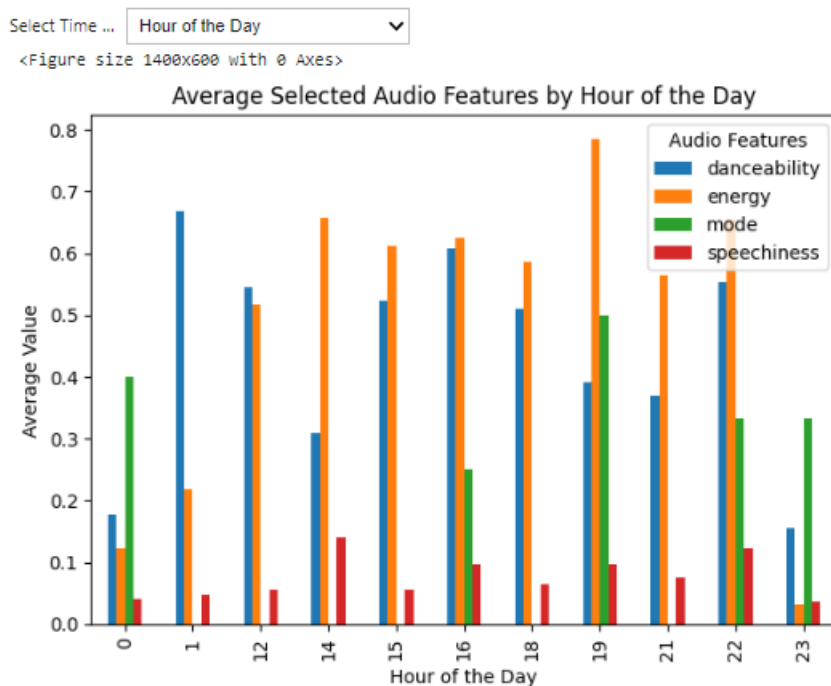
The purpose of this part is to gain insights into my personal Spotify listening habits, understanding patterns and preferences in my music consumption over time. This can be useful for potentially informing recommendations or further music exploration.

Listening Habits by Hour of Day

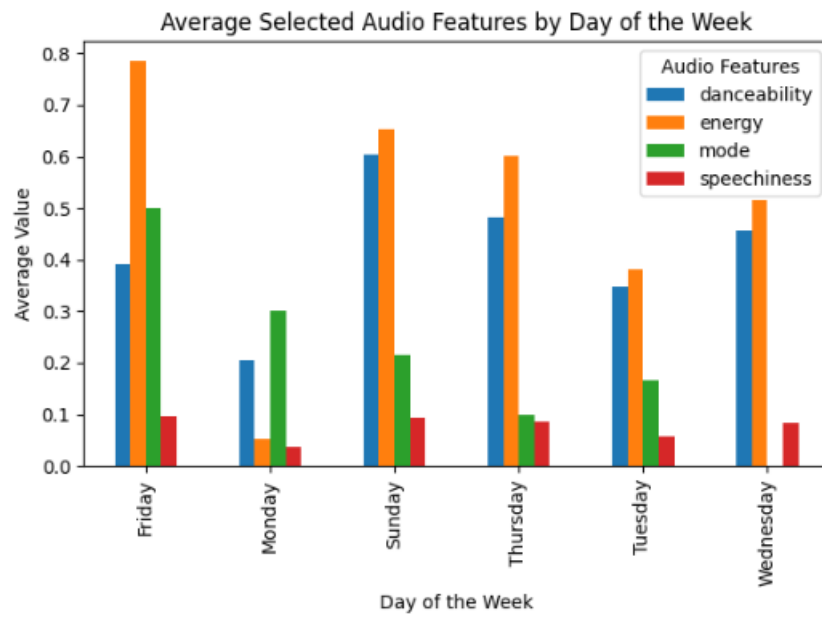Listening Habits by Day of Week

Listening Habits by Month
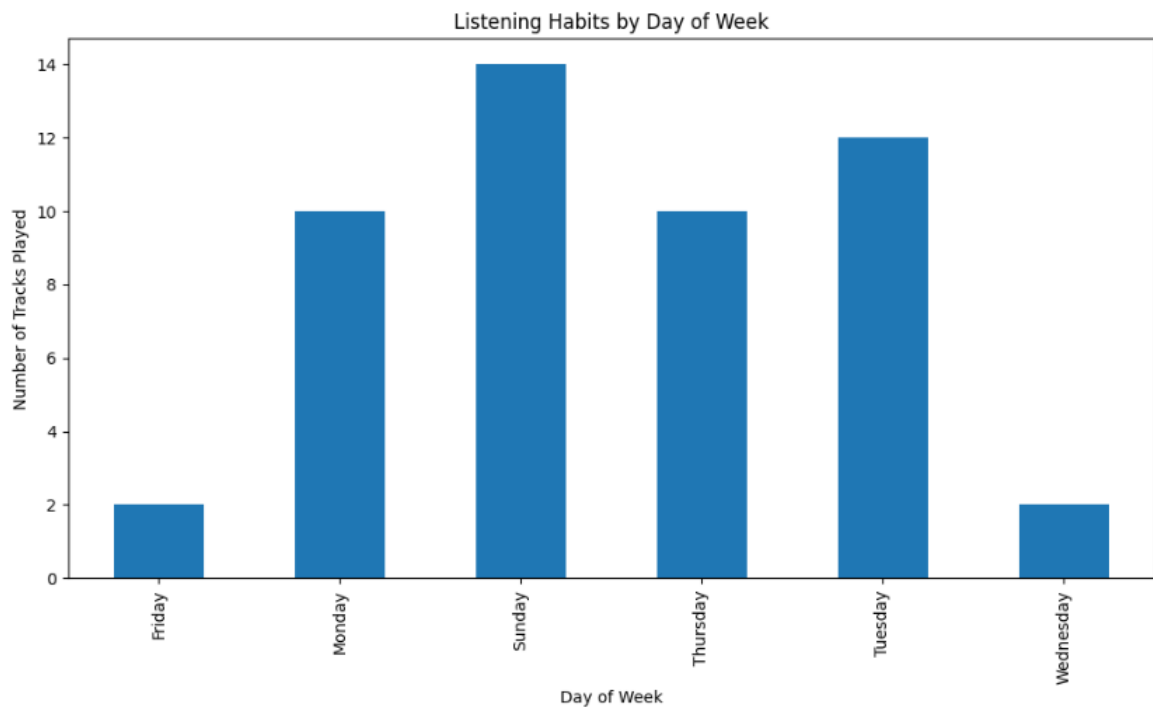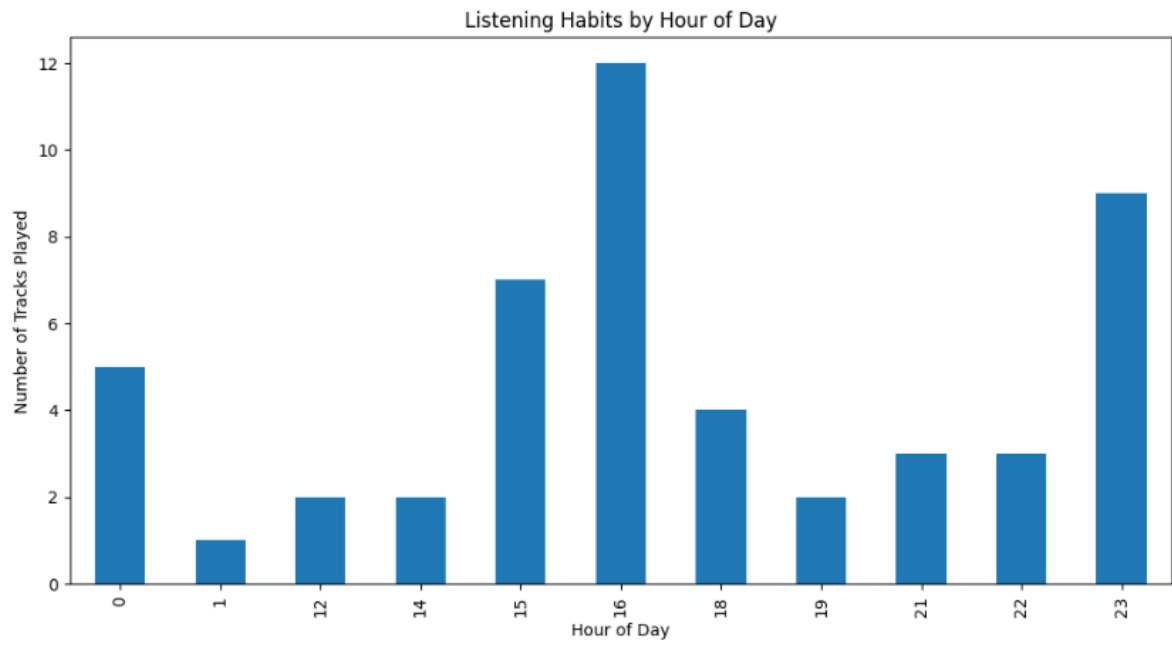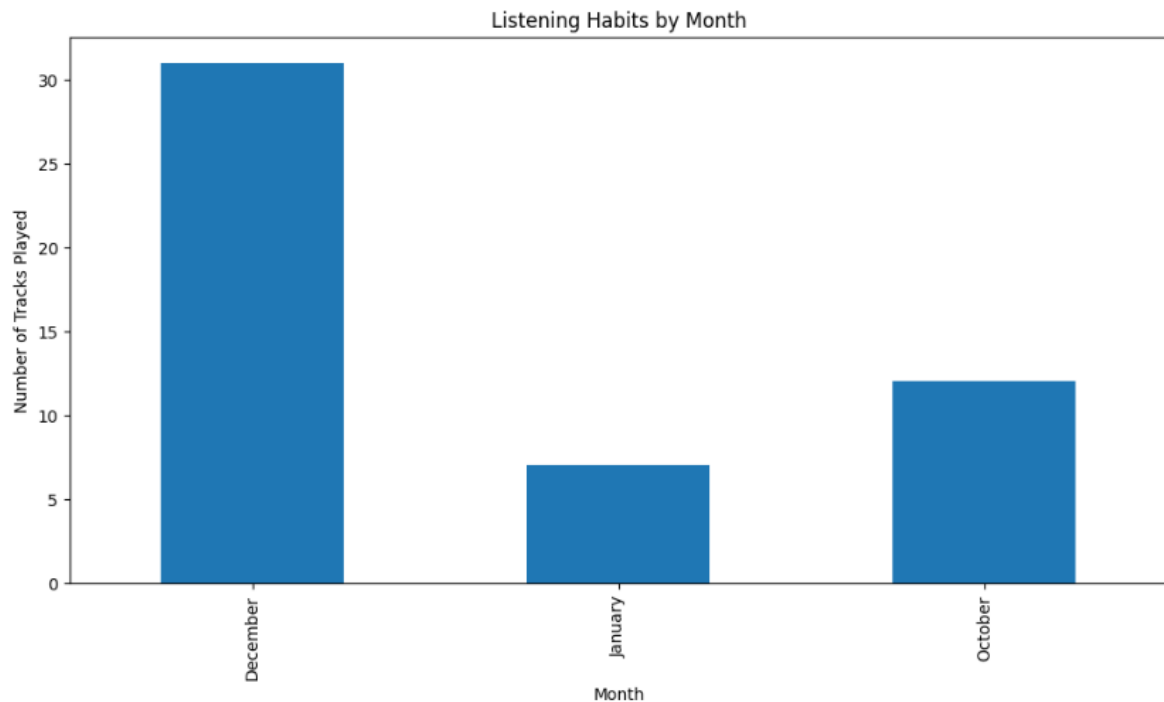
Analyzing My Mood Through Songs

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 ... Hour of the Day

`<Figure size 1400x600 with 0 Axes>`

Average Selected Audio Features by Hour of the Day

`<Figure size 1400x600 with 0 Axes>`

Average Selected Audio Features by Day of the Week

`<Figure size 1400x600 with 0 Axes>`

Average Selected Audio Features by Month