

Spotify Data

Musical Keys by Popularity

Major

Minor

The Data Set

Taken from a pool of Spotify's more popular songs, we can analyze trend through data such as Genre, Key, Tempo and more. This data contains roughly 50,000 songs with 10 genre's containing about 5,000 songs each.

Other data that Spotify uses are Acousticness, Danceability, Energy, Instrumentalness, Liveness, Speechiness, and Valence. These attributes will be further looked at and explained later in this project.

Music Key and Mode

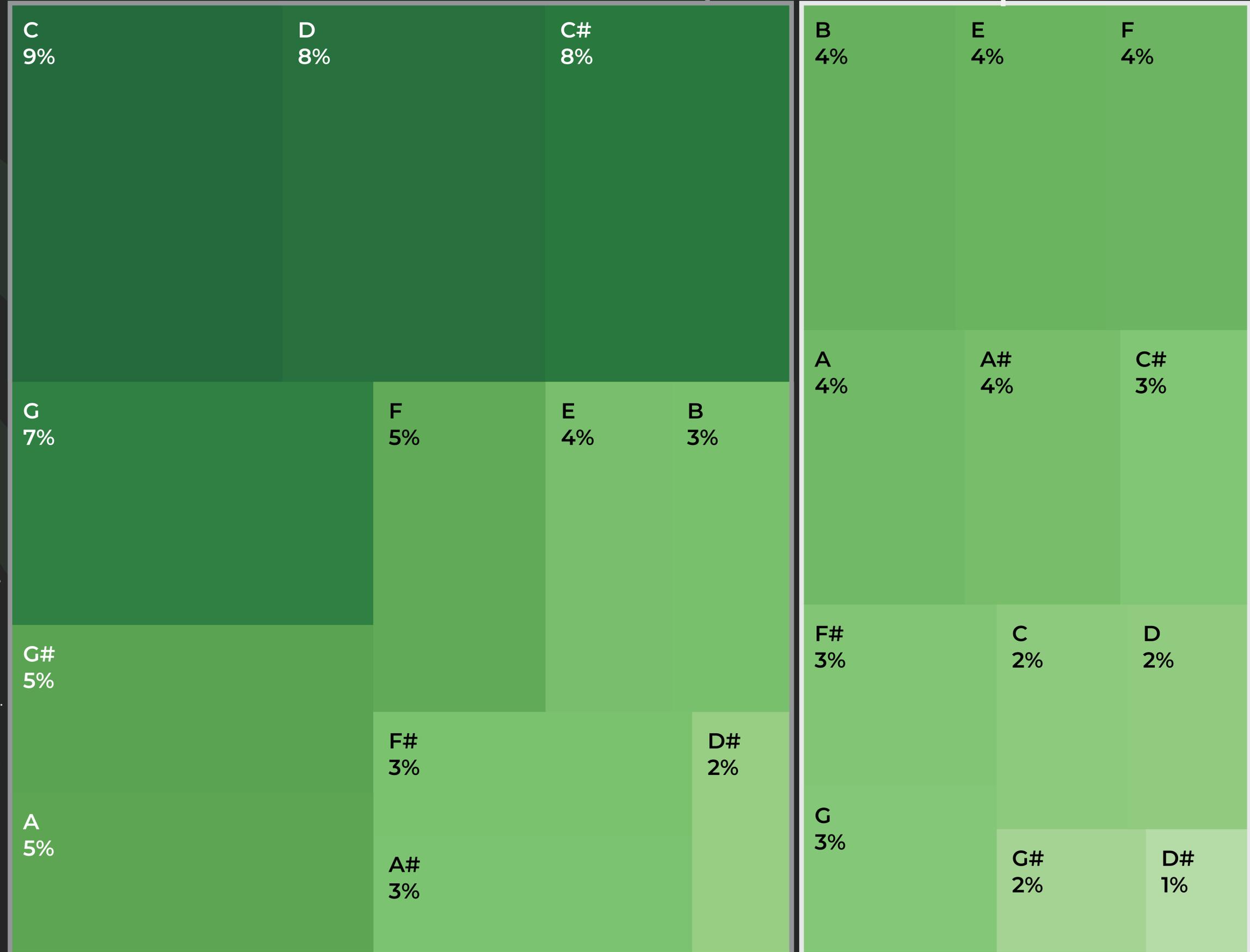
Based on a 2021 spotify data set with roughly 50,000 songs, we can see that the most popular genres are keys are in Major modes. It is no surprise that the most used key is C Major as it is often considered to be the happiest sounding key and the easiest to write in. Major keys in general are regarded to have happier vibes which could be why they are more popular as a whole. Minor keys are regarded to give off more of a gloomy or sad vibe which is not usually desirable in popular music explaining why we see less of it

% of total count of key



1%

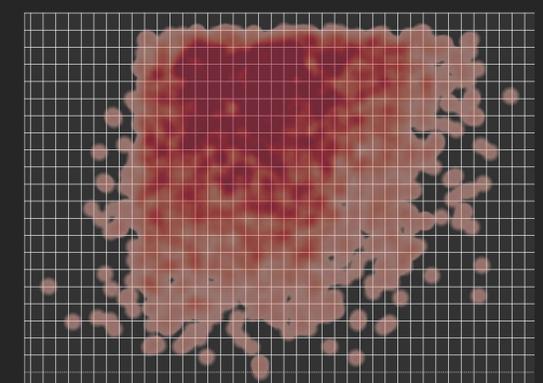
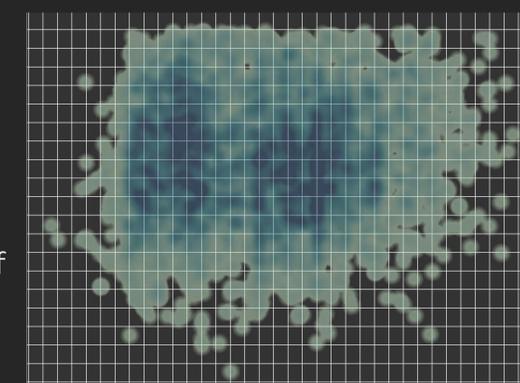
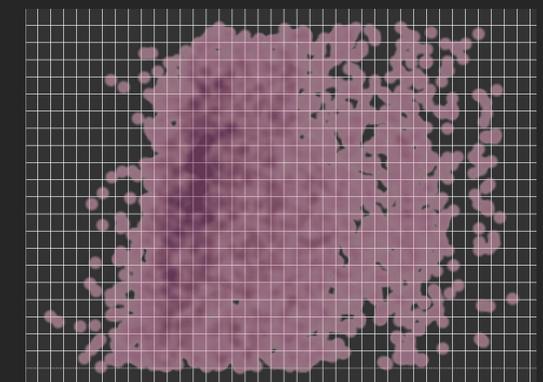
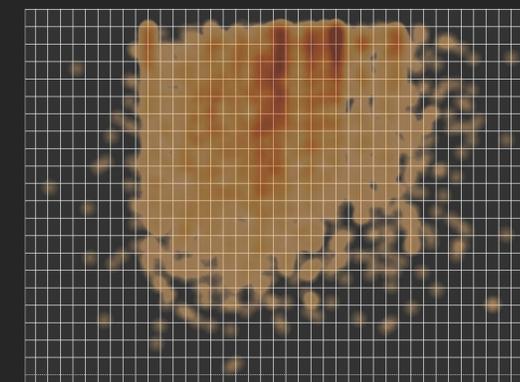
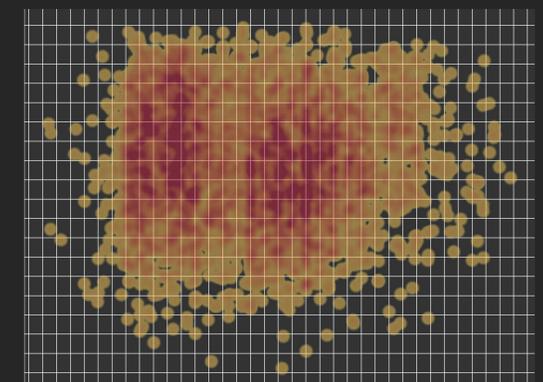
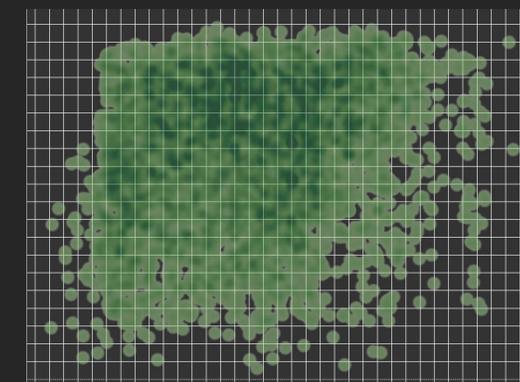
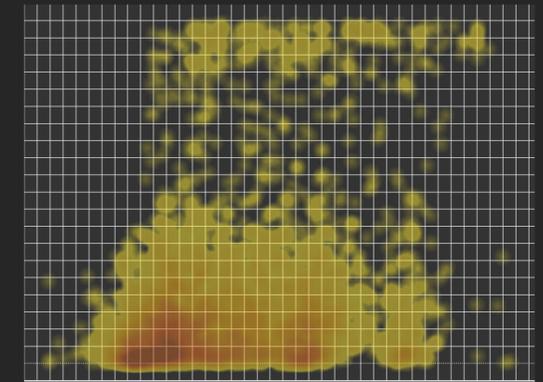
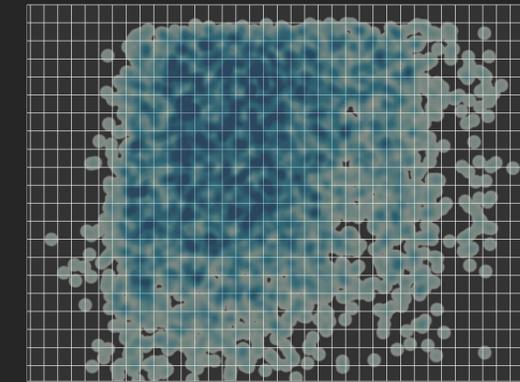
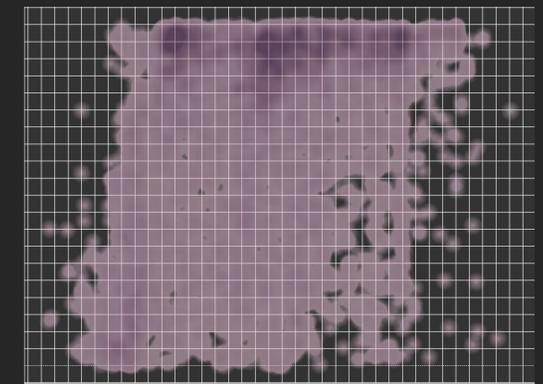
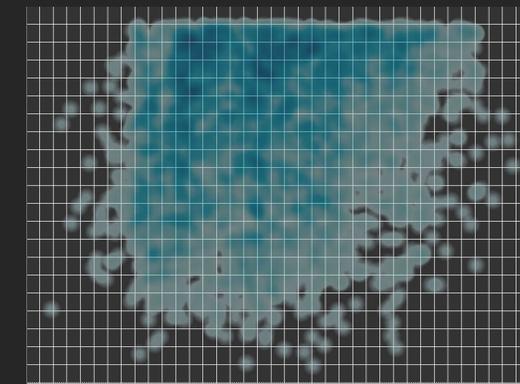
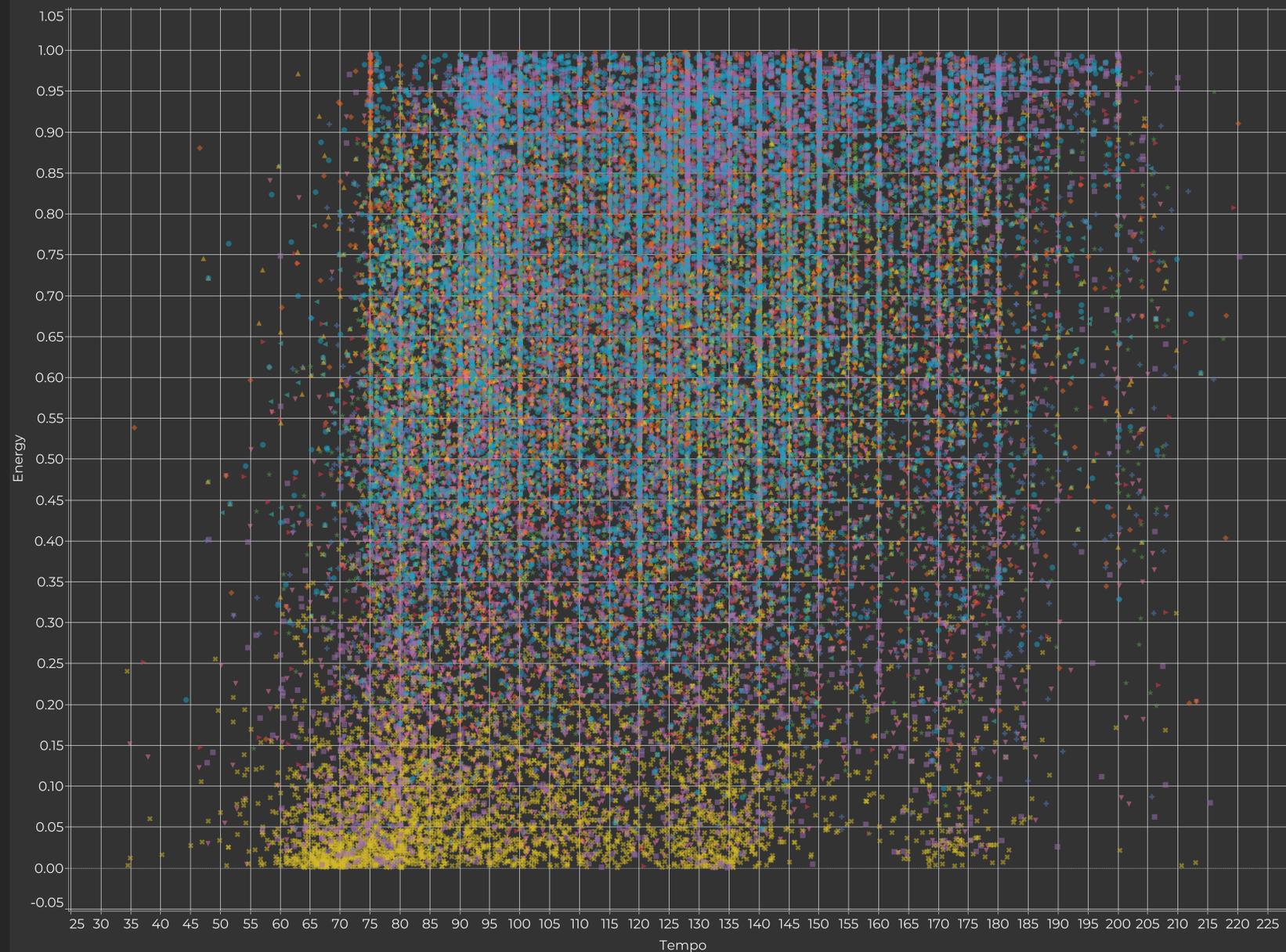
9%



Spotify Data

Energy vs Tempo

Music Genre



By analyzing the data of the Energy and Tempo throughout the ten genre's, we can see trends and make generalization for each music genre. **Energy** is measured based on how loud, fast and noisy a track is. **Tempo** is measured based on Beats Per Minute commonly referred to as BPM. Based on the graph's Classical music (Golden Yellow) has the lowest Energy and Tempo of all the genre's. Comparing it to genre's such as Alternative and Hip-Hop it is evident that they are generally higher in energy with a mixture of tempo's mostly leaning towards the middle range around 120 bpm.

Some other evident based on these graphs is that Electronic and Rap music are both spread out with a focus in the middle ranges of both Energy and Tempo. Jazz is spread out all over the place but with a focus in the mid-low tempo ranges. Anime is perhaps the most energetic out off genres, with Hip-Hop close by. Blues, Country, and Rock all have similar heat maps (with variances of course). This makes sense as much of stylistic and musical attributes of these three genre's stem from the same routes of old school blues music.

Spotify Data

Attribute Average by Genre

Energy: Energy is a measure from 0.0 to 1.0 and represents a perceptual measure of intensity and activity. Typically, energetic tracks feel fast, loud, and noisy.

Acousticness: A confidence measure from 0.0 to 1.0 of whether the track is acoustic. 1.0 represents high confidence the track is acoustic.

Danceability: Describes how suitable a track is for dancing based on a combination of musical elements including tempo, rhythm stability, beat strength, and overall regularity. A value of 0.0 is least danceable and 1.0 is most danceable.

Instrumentalness: Predicts whether a track contains no vocals. "Ooh" and "aah" sounds are treated as instrumental in this context. Rap or spoken word tracks are clearly "vocal." The closer the instrumentalness value is to 1.0, the greater likelihood the track contains no vocal content. Values above 0.5 are intended to represent instrumental tracks, but confidence is higher as the value approaches 1.0.

Valence: A measure from 0.0 to 1.0 describing the musical positiveness conveyed by a track. Tracks with high valence sound more positive (e.g. happy, cheerful, euphoric), while tracks with low valence sound more negative (e.g. sad, depressed, angry).

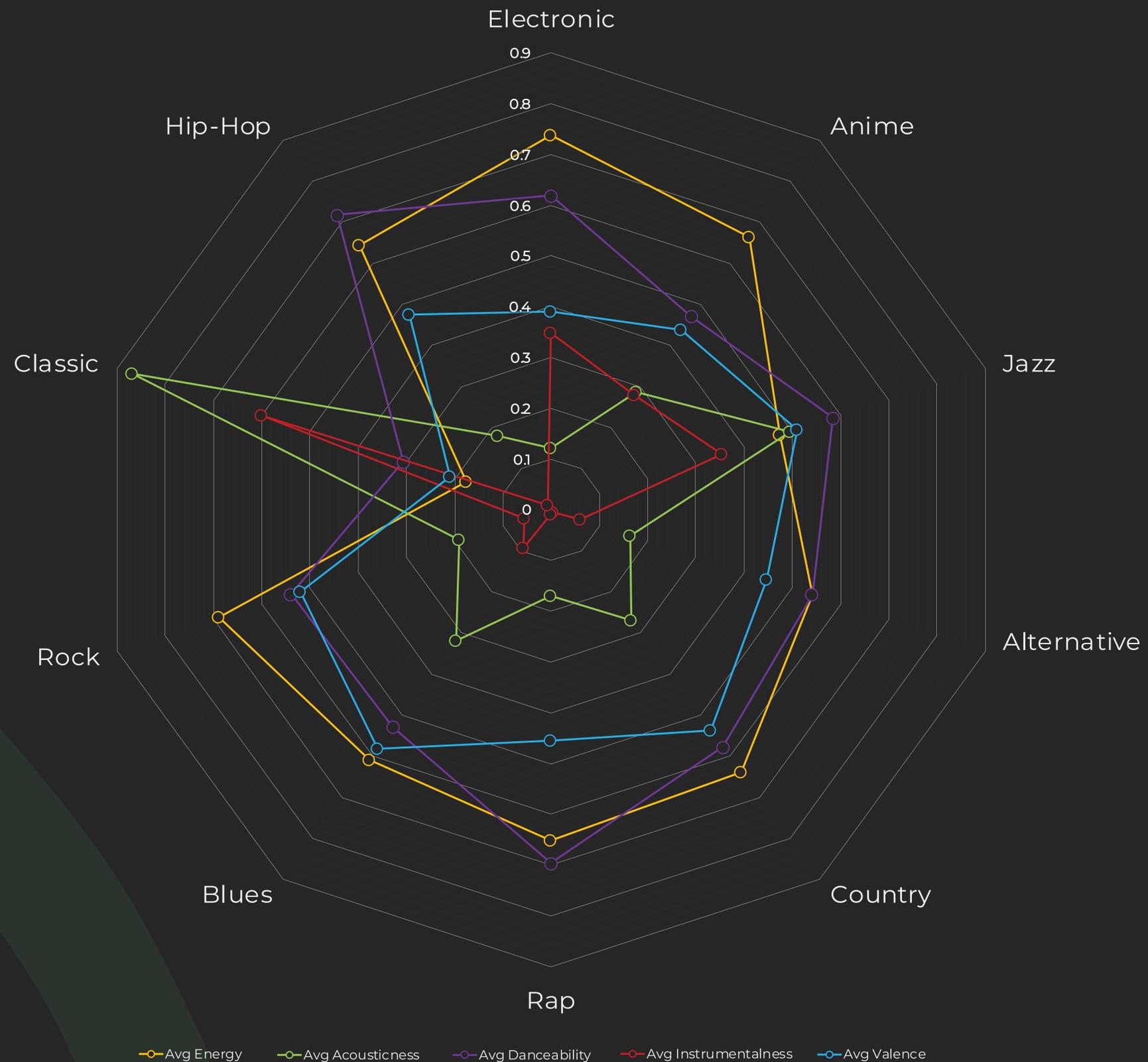
(Info taken from Spotify Developer Blog)

By analyzing the radar chart of averages we can confirm that classical music is indeed the lowest of all the genre's with Jazz as a distant second. The other genres are all higher on average with Electronic and Rock music leading in Average Energy.

The acousticness of the genre's brings no surprises. Classical music is only acoustic, with Jazz, Rock and Country showing a bit of acousticness as well.

Classical, Rap, Hip-hop and Jazz are all a bit more danceable than they are energetic. Electronic Rock Blues and Country are all a bit less danceable than they are energetic. Anime is the least danceable out of all genre's which could stem from the fact that it is focused on intro and background music on anime. Electronic music also may surprise in its danceability rating as most of Electronic music falls under the EDM (Electronic Dance Music) title. Electronic music has a lot more depth however, and has many sub-genres that stray away from the EDM psuedo type.

Classical is the most Instrumental with Electronic, Anime, and Jazz all showing a small amount of Instrumentalness.



Hip-Hop, Rap, Rock, Alternative, Country and Blues are all primarily non instrumental as they are all vocal focused genre's.

Valence appears the most even among genre's with Classical music standing out as the least Valent. The surprise here is that Blues has the highest valence rating. A genre named after its sad and depressing subject matter actually has the highest 'happy sound' score. This could be because blues is meant to cheer people up even if the subject matter is about heart break and pain.

Spotify Data: Rational and Evaluations

Design Rational

My group chose music as the main focus of our projects. Originally, our idea was to each choose a musical genre and display data based on those genre's. It was difficult to find data sets for the genre's we chose so we decided to work with whatever data pertaining to music we find. I decided to use this data set based on popular tracks available on Spotify. For the colouring I used Spotify inspired Green, Black and White. As for the detail, I used colours I felt did a good job representing the relevant data.

On page 1, I coloured the tree graph with shades of Green as to match with Spotify. To represent the Major and Minor modes I highlighted the boxes in gray and white in order split them up and make it easier to read.

On page 2 I started off with the larger graph that created a cool effect and showed some trends when you analyzed it carefully. The graph is fairly messy though (even at larger scales) which is why I decided to accompany it with smaller graphs that allowed a better understanding of trends. I used heatmaps as they highlighted the trends better than the dotted chart. I opted to leave out the titles on the heatmaps as they seemed redundant, took up space and looked noisy. Not only are these graphs visually appealing but they give a clear view of the genre's energy and danceability.

The radar chart on page 3 took several tries to workout. Due to the amount of data I was displaying, the radar chart became way too busy. To fix this I took out a couple of values that did not really fit on the 0-0.9 scale. It took many iterations to get the line thickness and dot style right without crowding the graph and making the points visible enough that they are easily readable. I left the dots without a fill because with a fill the dots looked busy.

Tools Evaluation

I originally wanted to work with Tableau however I was unable to create the radar graph I imagined in it. Tableau immediately started showing some limitations.

I moved to Excel in order to create the radar graph which was a bit tedious as I had to create a table of averages for every Genre and attribute. This process included a lot of dull copy pasting and editing individual formulas to develop the table. Finally, when this was done I used the table to create the Radar. This step took much less time. The downside to using excel is the clunky UX, limited design options and inability to edit multiple things at once.

It was nice that I was able to easily switch or remove Column and Rows to experiment with the graph's.

After the radar graph I wanted to create a scatter plot graph which I did in Excel at first but was unhappy with its limitations. Tableau shined in this situation as I did not need to create a separate table to calculate averages, Tableau can do that automatically. Moreover, I was able to manipulate the scatter plot graph to show only one genre at a time and then transform it into a heatmap. Doing this ten times was a bit tedious however it was much quicker than it would have been in Excel and produced better results.

For the last graph I attempted it first in Tableau which was fairly quick. To compare I also created it in excel but opted for Tableau as it provided me with more design options and was easier to manipulate.

Heuristic Evaluation

Overall I found Tableau intimidating at first but once you dive in the controls and UX begin to make a lot of sense. Although it has it's limitations, it's easy to see why Tableau is so popular for displaying data. It allows the user to quickly manipulate data and represent it in different ways as to create a better understanding of the data.

Excel also has its limitations however the major draw back of Excel is how tedious it can be to create tables in order to represent data in the way you want. Moreover, the design tools are fairly limited and create a tedious design experience that takes too much time. It is easier to import the created graph and edit in Illustrator and even then editing can be tedious as the import separates many of the graphs elements making it harder to manipulate and organise.