

Exploring the Relationship Between Spotify Users' Tempo and Time

In our increasingly digitized world, music streaming platforms like Spotify have become integral parts of our daily lives. With millions of users worldwide, Spotify generates vast amounts of data every day, offering a unique opportunity to explore how people interact with music. One intriguing aspect to explore is the potential correlation of music in a user's everyday life. For example, a person's energy level and focus can suggest either a calmer type of music. More specifically, the intersection of music tempo and time offers an interesting area of exploration in the realm of data analysis. By examining Spotify data, we can dive into how students' music listening habits vary over different times which can lead to further research into areas like productivity or task correlations (i.e. type of music students listen to between classes/finishing homework).

At the heart of this exploration lies a fundamental question: how does the tempo of music played on Spotify vary throughout a week of school and at different times of the day? By understanding how tempo fluctuates over time, I can offer insights into users' music preferences and potentially uncover underlying patterns in their listening habits.

The motivator behind this visualization lies in the potential revelations that may emerge from examining the relationship between music tempo and time. Are there certain times of the day when people gravitate towards higher-tempo music to boost their energy levels? Do weekends see a shift towards more relaxed, slower-tempo tunes? For instance, if my own music habits were reported graphically, viewers can observe a trend that indicates faster beats per minute (BPM) playing around noon since I typically gym around that time and slower BPM during nighttime as I study. Exploring these questions can provide valuable insights not only into music consumption patterns but also into broader societal trends and behaviors.

To visually represent this relationship, I first thought of creating a matrix plot of either circles varying in size or flipped line graphs for each day of the week, so you can compare the activity side-by-side. My initial rough draft is uploaded, and it shows a general overview of what I would like to visualize as well as how different data may be displayed.

The process of exploring this relationship involves careful consideration of data aggregation and visualization techniques. Initially, as I attempted to convert my sketch into Tableau, I had to experiment with various visual layouts. I included the first visual layout for the assignment indicated by "V1." The data is filtered to only include a semester's worth of listening activity to limit other factors such as summer break which may deter from my initial question. I also created multiple calculated fields that converted the time UTC to EST so that it would be more relevant for the students who participated in this data. Additionally, I also calculated to work with the start listening time rather than the end time because I thought it was more straightforward to comprehend. This draft did fulfill the general layout I had desired, but the overarching issue I noticed is the difficulty in reading the graph. Perhaps it is the regular exposure to reading a basic line graph from left to right, many of the peers I consulted agree that the vertical trends are difficult to grasp. After other attempts to consider how best to represent the complex interplay between tempo and time, I settled with a square matrix plot. I wanted to utilize

the sizing of the marks to demonstrate a portion of the data I wanted to convey. In the final draft, I was also able to incorporate color more meaningfully into the visualization. The color intensity reveals how high the BPMs are without factoring in the number of users at a certain time or the songs listened to, for example, the darker the color, the higher the tempo. In other words, I chose to visualize the overall total. I did this because the average BPMs were already indicated by each weekday panel positioning of the squares. This way the information covers a similar area (tempo), but it is also organized to represent a different aspect of the data. I also added a few labels for each day of the week to offer further insight into the average minimum and maximum tempos of a certain day of the week. Lastly, I brought it over to Inkscape to make some stylistic adjustments that I either failed to figure out on Tableau or just could not accomplish (i.e. moving labels that overlapped the data).

The journey of exploring the relationship between Spotify tempo and time has been both rewarding and challenging. While this visualization offers a compelling overview of tempo trends, further analysis could involve segmentation by user demographics or music genres for deeper insights. There are a few factors I am still unsure as to how to achieve without overcrowding the visualization. To start, I did not want the term “Avg. Tempo” to repeat across each day of the week on the y-axis, but I failed to manipulate Tableau into creating one general subheader on the y-axis. Since there are so many headers, I also faced concerns about what methods of visualization would be easier to understand and more intuitive to the viewers. Another specific issue was that I wanted the tickers of the average tempo to range from around 100 BPM to 150 BPM and appear in a uniform manner for each day of the week in order to better view the details of the trends. However, I was only able to figure out how to remove zero from being included which zooms the range of consideration in, but only with 120 BPM appearing. Lastly, I recalled from an in-class peer review for another student that adding lines through each square can make the visual easier to read, however, I struggled to format the lines through the square rather than boxing in the squares for each hour interval. Overall, these challenges can be fixed with more experience around Tableau and knowledge of the psychological reasonings of organizations for data visualization.

Ultimately, the exploration of Spotify tempo and time opens doors to a wealth of insights into users' music preferences and habits. By leveraging data analysis and visualization techniques, I was able to discover a relationship that can exist between tempo and time, shedding light on how music impacts our daily lives and productivity. If I had the opportunity to continue working on this graphic, I want to explore this with a bigger population group instead of only 14 personal IDs. I think with more data a lot more can be achieved and understood.