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CPSC 490

September 8, 2023

Ripplify: A beautiful way to visualize your music taste

For my CPSC 490 senior project as advised by Professor Stephen Slade, I'll be building a sophisticated data visualization platform to enable users to examine their Spotify music listening history. To be sure, Spotify music analysis platforms are legion. One scarcely needs to spend much time on Instagram, Snapchat, or other social media before they'll be bombarded by screenshots of their friends' music choices. Receiptify, Icebergify, Festify, and countless other websites allow users to authenticate with their Spotify accounts, and then generate an image showing the user their favorite musical artists stylized as a receipt, an iceberg, a music festival poster, and more.

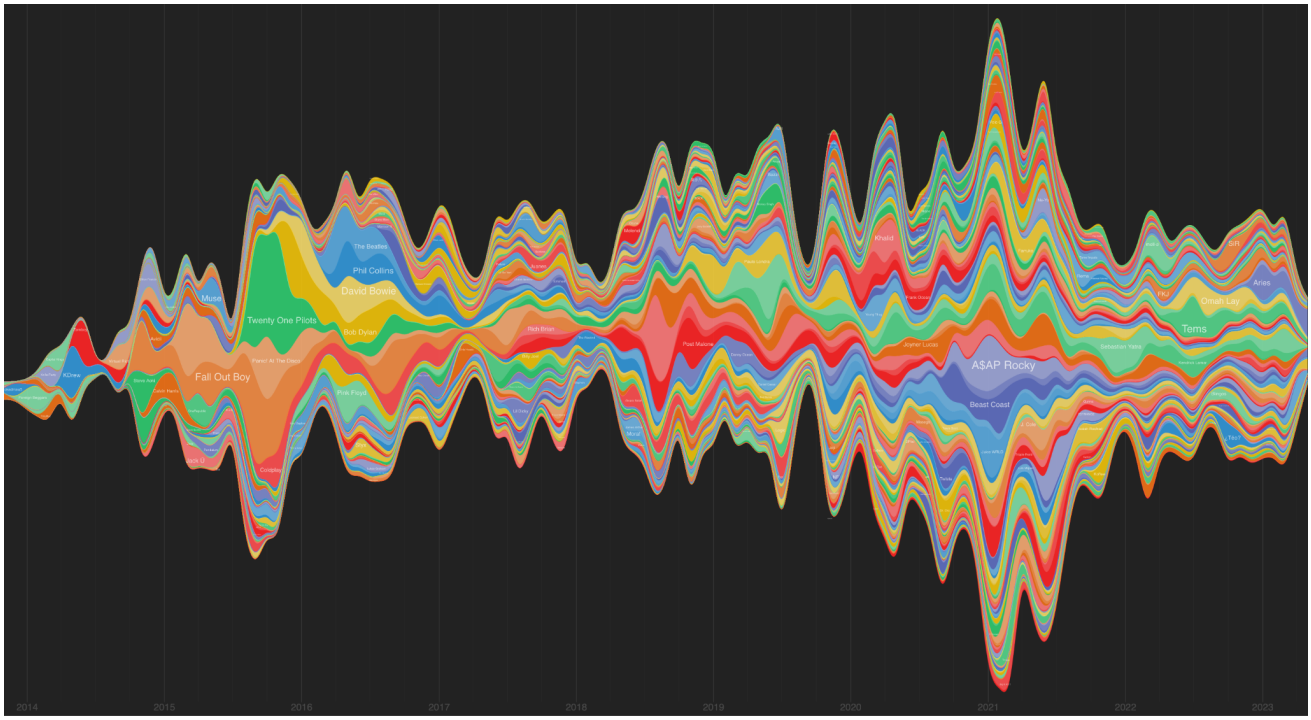
Each of these websites is based on performing a query to Spotify's API, which provides precomputed records of users' top 10 or 50 artists over the course of the prior month, six months, or the entire history of the account. This information is doubtless a delight to explore. However, Spotify doesn't show all its cards through its API. In truth, the company stores a profound amount of data, including a detailed every single song play that a user has ever performed. Each record holds:

- The ID, name, artist, and album of the track (or episode and show name, for podcasts)
- The timestamp the song was played at and the number of milliseconds for which it was played
- The country, IP, operating system, and user agent string from which the user executed the play
- The reason the song was played: was it directly clicked on, played at the end of the previous song in a series, played as the result of the user clicking on a playlist, arrived at after skipping another song, arrived at after the user clicked the "back" button, etc.?

- The reason the song stopped playing: did it end, was it paused and never returned to, did the user skip it, did the user quit the Spotify app entirely, etc.?
- Was the song played while in shuffle mode, or private listening mode?

This data is likely used behind the scenes by Spotify to compute the far more limited top-artists and top-tracks information that they provide through their API. The full dump of "Extended Listening History" can be obtained through the Spotify privacy settings and submitting a request. Unfortunately, this data can take as long as 30 days for Spotify to send to a user, limiting the virality of any platform based upon it. Nevertheless, I'm confident that the visualization approach I'll implement will be delightful enough to inspire a substantial number of users to enjoy my project.

When investigating potential approaches for visualizing the entire detailed history of a Spotify user's music listening behavior, my mind quickly was drawn to the "stream graph" data visualization method described in Byron & Wattenberg (2008). By leveraging the "stream graph" visualization algorithms, I plan to generate truly stunning views of a user's music taste and its evolution over the years. I've already begun work on a prototype rendering program, and the results are already excellent:



While I'm pleased by this early result, I have a large number of improvements in mind for the platform, to be completed over the course of the following timeline:

September 8th (complete): I will deliver a client-side program that renders a stream graph of a user's music taste given a local file with their Spotify Extended Listening History.

September 18th: I will have implemented a web interface and backend that enables a user to log in with Spotify, upload their data file by following visible instructions on-screen, and render a stream graph of their own.

September 25th: These webserver components will be fully hosted on AWS (or a different platform, if I deem appropriate), with no need for local hosting of any component.

October 2nd: Users will be able to use the web interface to view the evolution of tastes of songs from a given artist, in addition to the original functionality of analyzing their taste of different artists.

October 9th: The front-end of the website will show clear loading animations for uploading data files and performing rendering.

October 16th: Users will be able to choose from a variety of graph modes (such as starting the graph from the bottom of the screen, or expanding the graph to fill the screen and making the size of artists be ratio-based rather than absolute).

October 23rd: Users will be able to choose from multiple dynamically-generated color schemes, and will be able to restrict the range of hues, saturation levels, and lightness levels to get the perfect image.

October 30th: Users will be able to choose the level of granularity of their data, from monthly, weekly, or daily. (Currently the only option is monthly.)

November 6th: Users will be able to exclude certain artists from being shown, through a cleanly designed website component that will help them match artist names in a dropdown.

November 13th: The website will be actively serving real-world users following initial promotion to friends and family.

November 20th: The front-end of the website will be highly visually refined and aesthetically pleasing.

November 27th: The website will be serving a wide community of users after promotion on social media (such as on Reddit pages like “DataIsBeautiful”).

December 4th: The website will support sorting and color-coding the artists by their primary genre.

If I have remaining time, I will begin work on ascertaining the practicality of fabricating wall prints of the graphics my project generates for people. This is inspired by a number of friends to whom I’ve shown the renderings who have independently asked me to sell them prints, tee shirts, and other merchandise of their music tastes.

Deliverables: I will turn in a codebase capable of enabling users to log in, upload their Spotify data, and configurably render images of their Spotify listening history based on a variety of parameters. The full featureset will follow the terms described in my timeline. I will also deliver a poster as of December 8th showing the results of my work.

I look forward to building out this exciting project and working toward the delight of my future users.