Spotify Playlist Mood Visualizer

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I was not familiar with Spotify API. So first went through spotify web API docs.
I made a quick form using materialize.css. lite-server used to speedup workflow but then discarded.

I tested few ideas for visualization part:

idea#1 was to add background colors to tracks with small variations.
idea#2 was to add background color to the page (tried all directions).
idea#3 was to animate background color with 'ease' according to order of tracks

at this point i realized there are at least a hundred things possible and I should first focus on what exactly is required. So I started thinking about 'what is a mood' and how a visual representation of a mood would look like? For example a playlist of sad songs would not have all the diverse colors lingering.

I listened to few tracks to see get the feel of what the playlist sounds like while thinking more about how to define a mood of a playlist or perhaps the mood that playlist creator had while curating the playlist.

I checked youtube playlists and the kind of colors they use as video image and hopefully find some genuine colors.

I Checked how spotify defines valence :
https://community.spotify.com/t5/Content-Questions/Valence-as-a-measure-of-happiness/td-p/4385221

energy wise = relaxed songs, casual listening, high energy;
valence wise = sad, chillout/neutral, happy;

Energy	Example Value	Visual
relaxed	0.3	
casual	0.55	
high energy	0.8	

Valence	Example Value	Visual
sad	0.3	dark shades
neutral	0.55	
happy	0.8	

some important question :

- how should a sad songs playlist and a dance playlist defer in feel as they defer in mood?
- how can the order of tracks be used in visualization?

1) a sad playlist would (what I would prefer) would be **dark shades** definitely. (maybe use random colors and set mood with shades?)
2) a sad and high energy playlist would be dark and **a bit extreme on color differences** - example - showing boldly black to maroon or red for a death metal playlist (high energy, dark, depressing)
3) a sad and low energy should have **smooth gradient, not that dramatic**, colors can be red but red, blue or a palette would also work given its NOT bright and too diverse
4) a motivational playlist should have bright colors (no reds), (sunny) dramatic on color diversity for high energy median and
5) calm and soothing for low energy median

idea#4 maybe add a small stripe of color on each track to show how individual track colors sum up to set the mood i.e. background for playlist. maybe that would work and at same time look genuine and subtle enough and not crappy or cheesy as in simpler implementations;

a pattern can be identified in this
energy == (somewhat) saturation
valence == brightness, also decides color palette

I made a google spreadsheet to map all extremes and hopefully find a sensible method to deduce mood of playlist and track. I concluded I need two categories of color palettes and I can adjust them for low energy versions.

https://docs.google.com/spreadsheets/d/1a4tsxC0jpOf9Wtgs9KEfYTeo7lAotsWAXXHiF70YJmg/edit#gid=0

One strategy that felt okay is to first calculate playlist energy mean and valence mean, select a palette based on that then color tracks from that palette

idea#5 just to uniquely represent playlist's mood in colors, I can show bands of colors and on hover track details are visible. but maybe not.

for inspiration I tried these:
https://www.dtelepathy.com/blog/business/how-to-tell-a-powerful-story-with-data-visualization
https://in.pinterest.com/pin/646759196461856179/
https://in.pinterest.com/pin/91268329929313631/?lp=true
https://behance.net
https://abduzeedo.com (one idea was to fetch a random image from abduzeedo and add a color overlay according to valence)

for color palettes:
https://coolors.co/88ccf1-bfdeef-347ca3-2d6989-2c6a8c
https://coolors.co/f71909-e55812-faf0ca-f4d35e-daff7d

Finally I decided to curate a palette from which I choose a color based on '**energyMean'**.

idea#6 thought about just forgetting the background colors (keep something simple). make a timeline from first track to last (gradient-ed). red-ish for sad tracks blue-bright for happy tracks?

algorithm for color mapping:

- calculate energy and valence means
- apply radial background to body using energy mean and valence mean of all the tracks
- choose a color for valence (from valence palette) and added it as a left border on card
- choose a color for energy (from energy palette) and added it as a top border on card

I used https://github.com/spotify/web-api-auth-examples as mentioned in Spotify's Web API docs.
created a gmail and a spotify account. then registered an app for this.

Username: 63g8ak176kag7t55z5sy9cqhk
Password: 63g8ak176kag7t55z5sy9cqhk

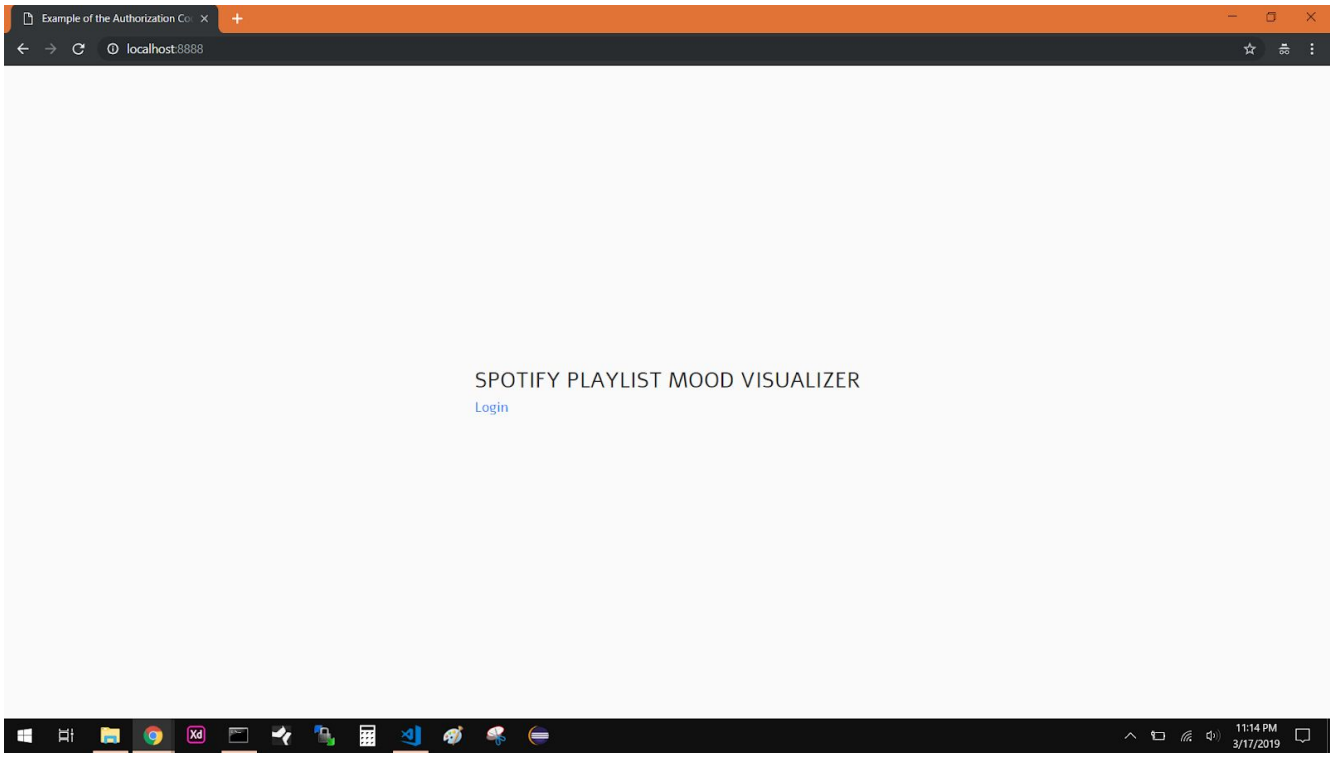
after implementing the visualization, I realized I made the the wrong implementation. As it was mentioned in docs, **app needs to be authenticated and not user** but I did not have enough time left to implement the changes and test again.
I decided to go with the code as it was and not **Client Credentials Authorization.**

I found JS wrappers that I could've used:
https://developer.spotify.com/documentation/web-api/libraries/#web-api-wrappers

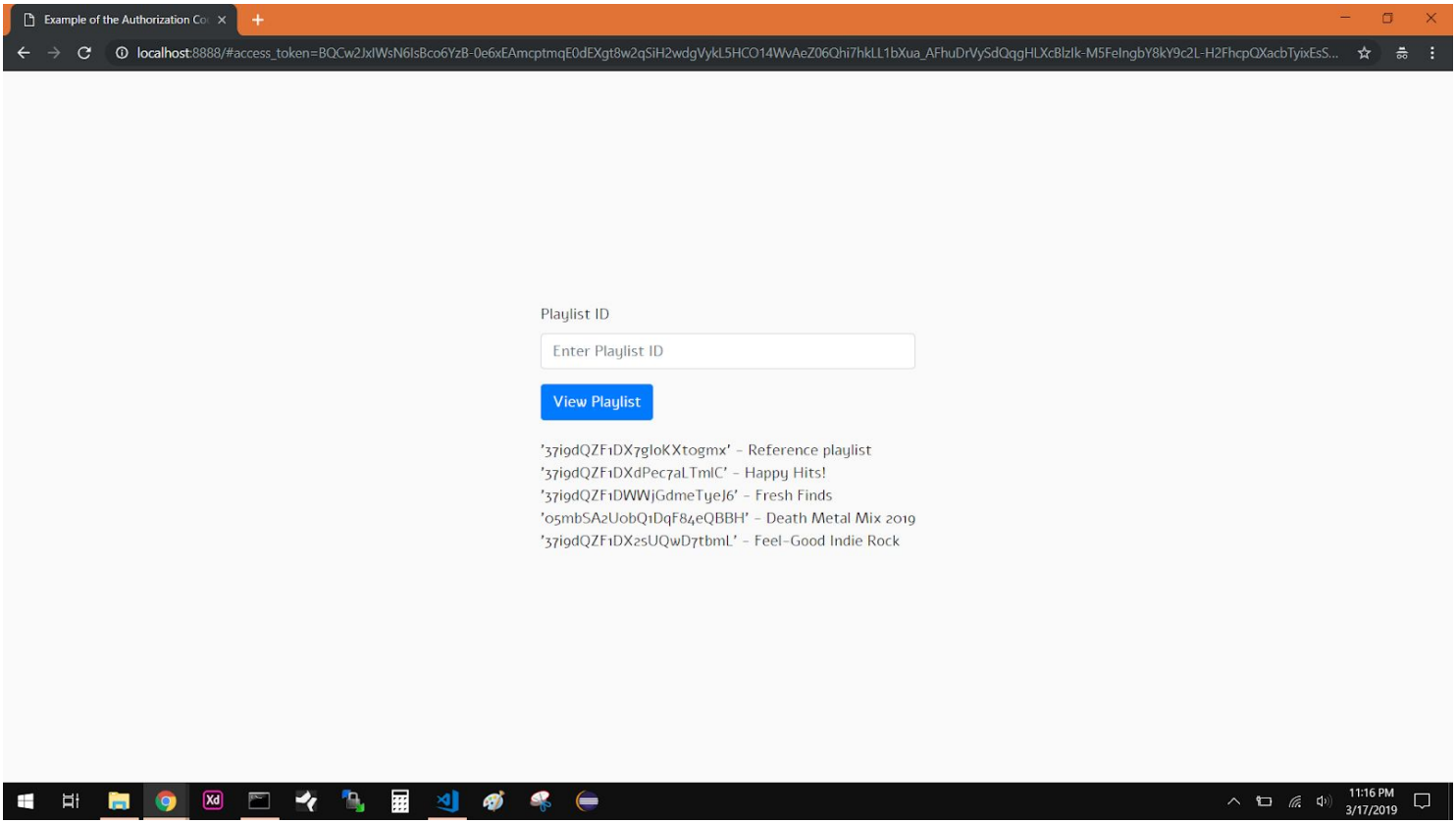
Output:
https://github.com/gauravbora2008/spotify_task/tree/master/output_snaps

How to install:

1) App runs on Node.js. Just clone the repo and run **npm install.**
2) Then to start server navigate to **authorization_code** folder and run **node app.js**.
3) Now open http://localhost:8888 and you should see a login screen as follows:



4) Click and login and enter **63g8ak176kag7t55z5sy9cqhk** as username and password.
5) A form will be visible on next page with a list of test playlists I used:



6) Just copy a playlistID and paste into then box. Then **click** on **View Playlist** button. I wanted to but could not add pressing enter button to display data. Or a simple <form> would also have worked well.

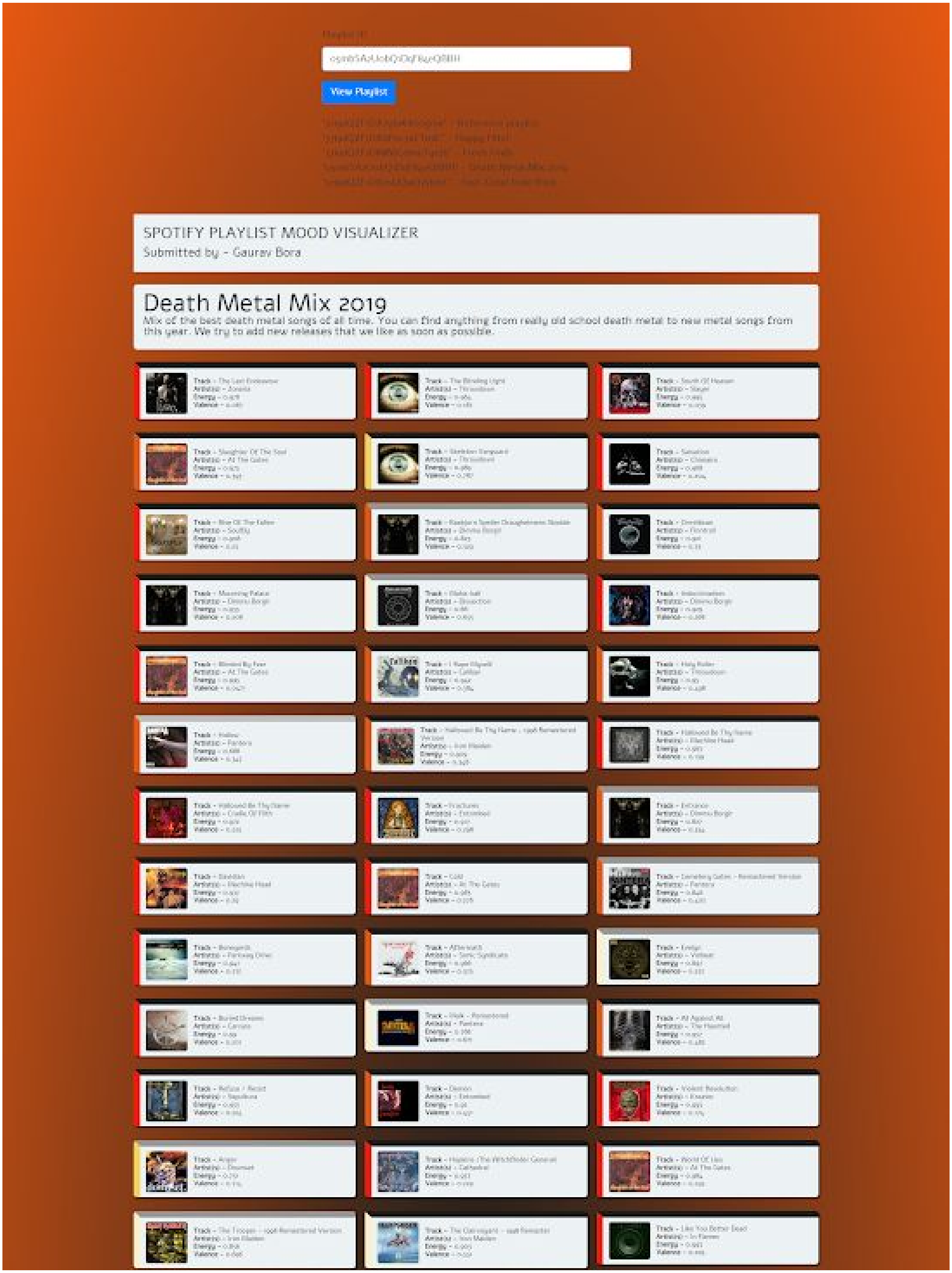
7) A playlist mood visualization should be visible now: (continued on next page)

all output snaps:
https://github.com/gauravbora2008/spotify_task/blob/master/output_snaps/screencapture-localhost-8888-2019-03-17-23_07_33.png

https://github.com/gauravbora2008/spotify_task/blob/master/output_snaps/screencapture-localhost-8888-2019-03-17-23_08_56.png

https://github.com/gauravbora2008/spotify_task/blob/master/output_snaps/screencapture-localhost-8888-2019-03-17-23_09_57.png

https://github.com/gauravbora2008/spotify_task/blob/master/output_snaps/screencapture-localhost-8888-2019-03-17-23_10_35.png


View Playlist
SPOTIFY PLAYLIST MOOD VISUALIZER
Submitted by - Gaurav Bora
Death Metal Mix 2019
Mix of the best death metal songs of all time. You can find anything from really old school death metal to new metal songs from this year. We try to add new releases that we like as soon as possible.

JSON Handling:

I made two requests to Spotify API. First to fetch tracks of playlist with an playlist_ID and second to get audio features for all the tracks. The second request upon success adds audio features data for individual tracks (energy and valence) into data received from first request. This data is then passed to handlebars and UI is rendered.

Final Notes:

I really enjoyed doing this task. I could have implemented the authorization flow correctly but I made the mistake early on and then no time was left. A bit disappointed on that.

Things I had in mind while finishing off:

- HTML/CSS/JS code can be improved a lot. I rushed and messed up code at many places. No optimization, no polyfills, no vender prefixes added. I ran it in Chrome (v72).
- Color palette can be fine tuned to improve overall look and feel of page. It can be more subtle and blended. It is a bit loud right now.
- It was such a beautiful task (I just loved doing it, being a musician and a coder). If we include other audio features like **danceability, loudness** etc. amazing visualizations can be designed. I thought about scatterplots, and animated gradients.
- I looked at a lot of pens at codepen.io also and a lot of ideas can be worked upon. Such as: https://codepen.io/ge1doot/pen/GQobbq : the slow animation can be mapped to playlist and colors and height of lines can be mapped to energy and valence. Or something like that. There are a lot of possibilities definitely. Or we can have a randomly generated tree colored with mean valence color gradient of some sort.