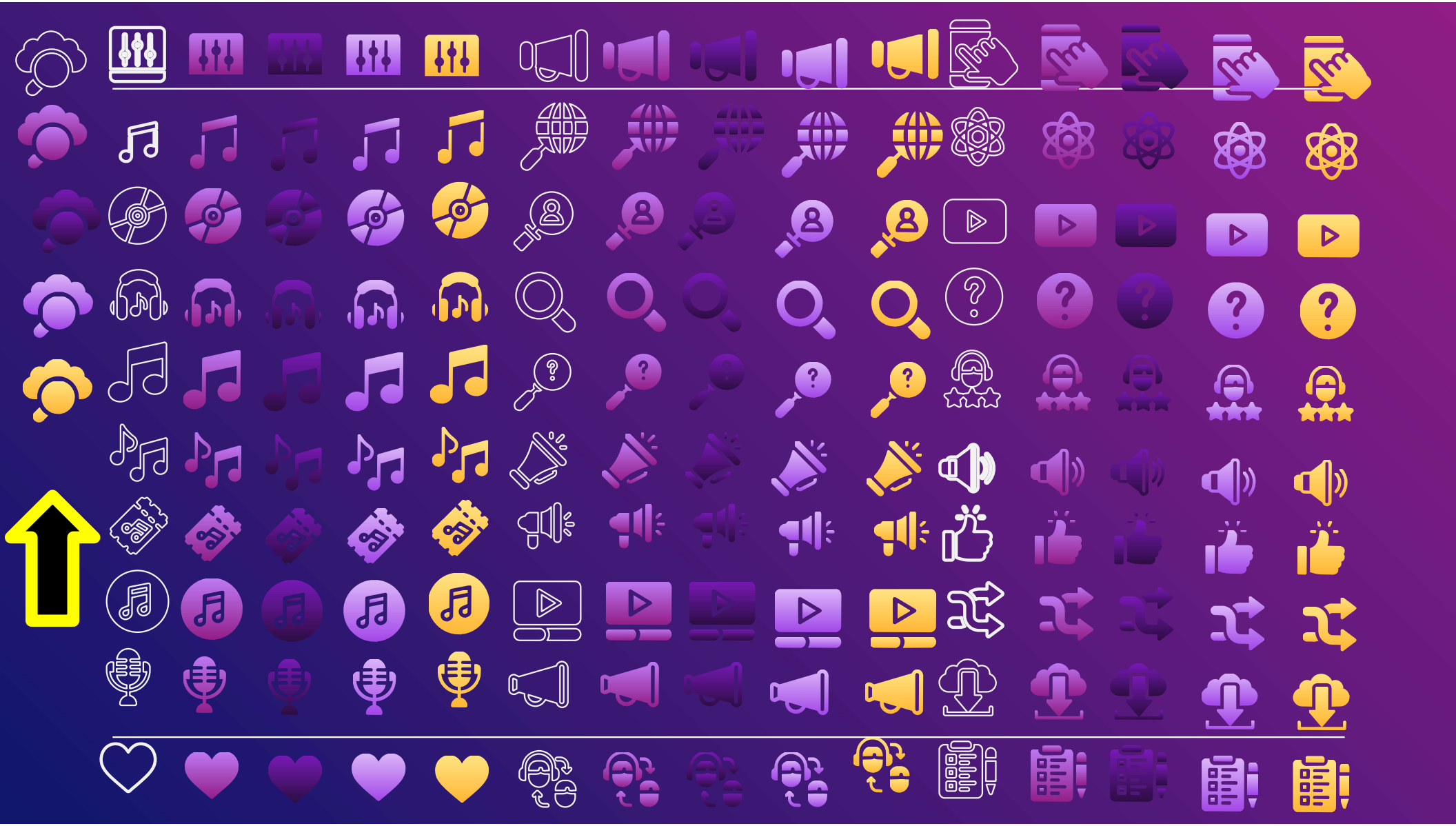
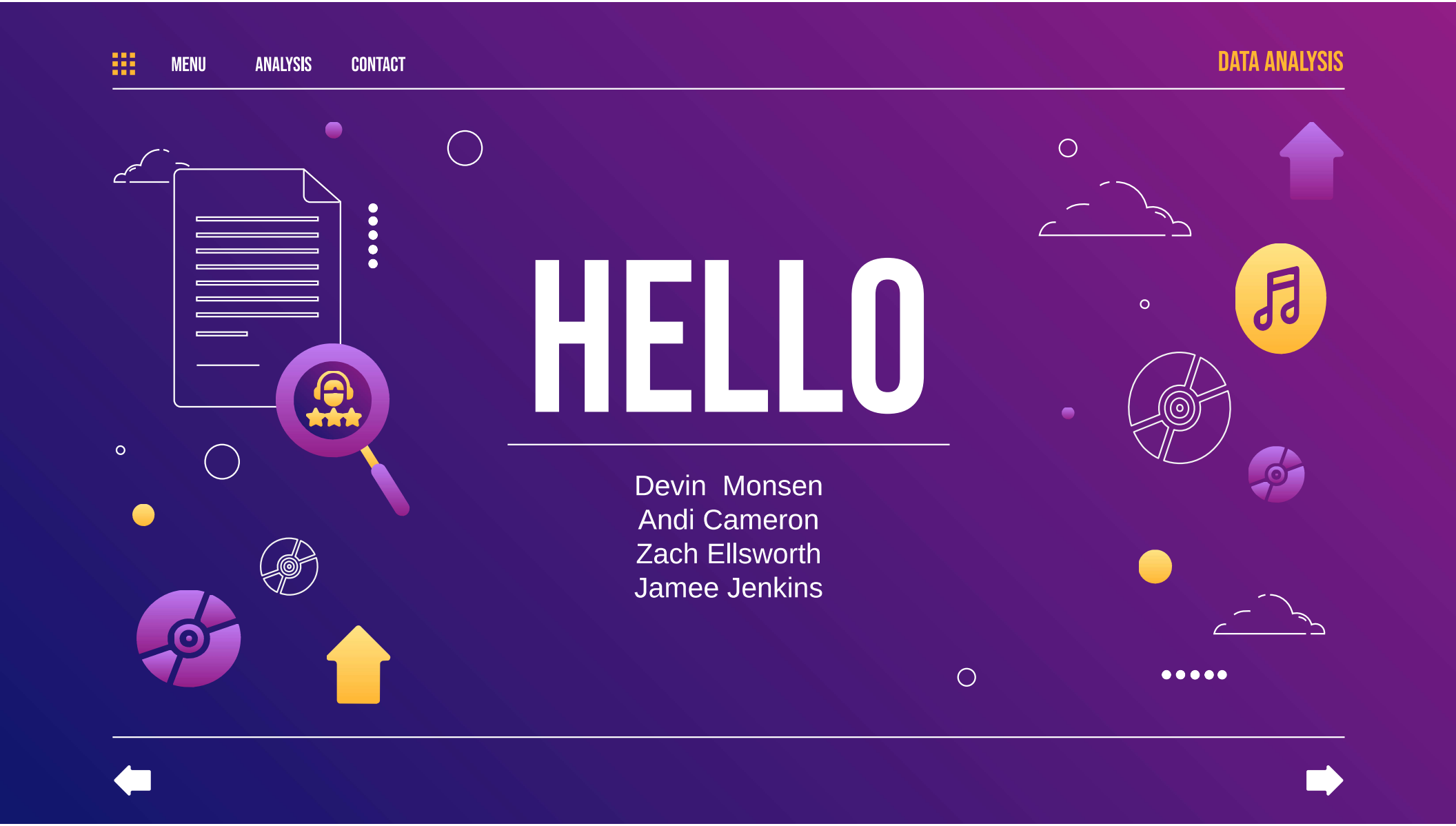
MENU ANALYSIS CONTACT

DATA ANALYSIS

SONG MOOD ANALYSIS

Play that funky music RIGHT!




MENU
ANALYSIS
CONTACT
DATA ANALYSIS
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Andi Cameron
Zach Ellsworth
Jamee Jenkins

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INTRODUCTION

Music can greatly alter the mood of the listener. It can help hype up a crowd at a party, or soothe as you wait on hold or in an elevator. Music triggers emotional responses whether positive or negative

01

THE QUESTION

PURPOSE

MUSIC

As connoisseurs of the music industry, we recognize the vast range of emotional release that music can induce.

LANGUAGE

The purpose of this study is to examine the language of music and attempt to anticipate the effects on a listener.

QUESTIONS TO ANALYZE

ATTRIBUTES

How can rhythm, loudness, or other attributes of a song prompt an emotional response?

IMPORTANCE

Which attributes are most important in determining the emotional resonance of a song?

PATTERNS

Is there a pattern of attributes that could affect individuals similarly?

02

WHAT WE DID

DATA PREPROCESSING

DANCEABILITY

The higher the value, the easier it is to dance to the song

LOUDNESS

The higher the value, the louder the song

TEMPO

The higher the value, the faster the song is played

id character varying (22)	danceability double precision	energy double precision	loudness double precision	valence double precision	tempo double precision	acousticness double precision
7lmeHLHBe4nmXzuXc0H...	0.47	0.978	-5.399	0.503	117.906	0.0261
1wsRitfRRtWyEapl0q22o8	0.599	0.9570000000000001	-5.763999999999999	0.489	103.68	0.0129
1hR0fIFK2qRG3f3RF70pb7	0.315	0.97	-5.4239999999999995	0.37	149.749	0.0234
2lbASgTSoDO7MTuLAXIT...	0.44	0.9670000000000001	-5.83	0.574	96.75200000000001	0.163
1MOTmpYOZ6fcMOc56Hd	0.426	0.929	-6.729	0.539	127.059	0.00162

DATA PREPROCESSING CONT

ENERGY

The higher the value, the more energetic the song

VALENCE

The higher the value, the more positive mood of the song

ACOUSTICNESS

A higher value would indicate acoustic instruments and a lower value would indicate electronic instruments

id character varying (22)	danceability double precision	energy double precision	loudness double precision	valence double precision	tempo double precision	acousticness double precision
7lmeHLHBe4nmXzuXc0H...	0.47	0.978	-5.399	0.503	117.906	0.0261
1wsRitfRRtWyEapl0q22o8	0.599	0.9570000000000001	-5.763999999999999	0.489	103.68	0.0129
1hR0fIFK2qRG3f3RF70pb7	0.315	0.97	-5.4239999999999995	0.37	149.749	0.0234
2lbASgTSoDO7MTuLAXIT...	0.44	0.9670000000000001	-5.83	0.574	96.75200000000001	0.163
1MOTmpYOZ6fcMOc56Hd	0.426	0.929	-6.729	0.539	127.059	0.00162

DATA ANALYSIS & MACHINE LEARNING

GROUP

Group songs on chosen attributes

SPLIT DATA

Use K-means clustering elbow method based off features

CHECK

Make sure we have enough features to correctly group songs

MOOD

Determine mood based of songs in grouping

DATABASE

Using PgAdmin and SQLAlchemy, 2 tables were joined using id (song id).

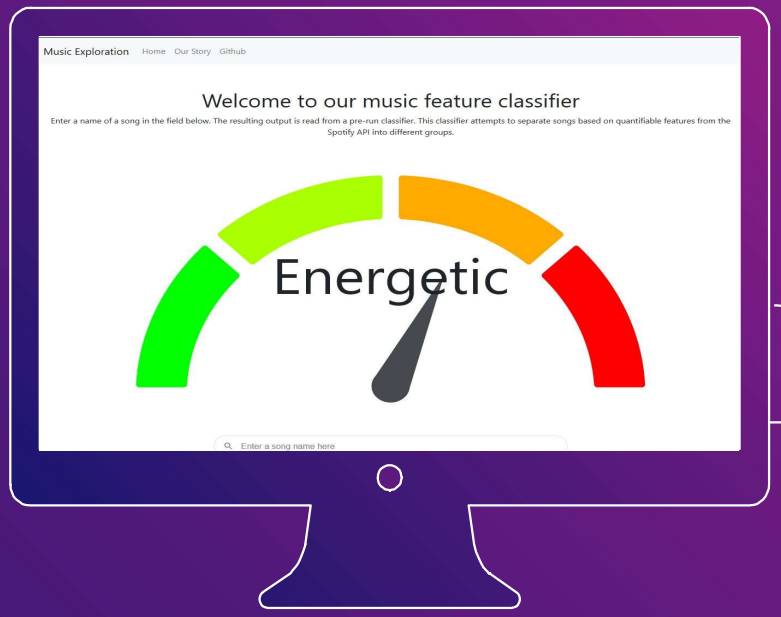
- Spotify_track_info lists the id, name of song, and the artist
- Spotify_features lists the id and the chosen attributes: energy, loudness, valence, tempo, and danceability

Sample table was created to show the top 100,000 songs due to size limitation

DASHBOARD

Visualization and dashboard produced through plotly python libraries and [dash]GitHub hosted at:

https://neuralburst.io/MusicGroup/raw



MENU ANALYSIS CONTACT

DATA ANALYSIS

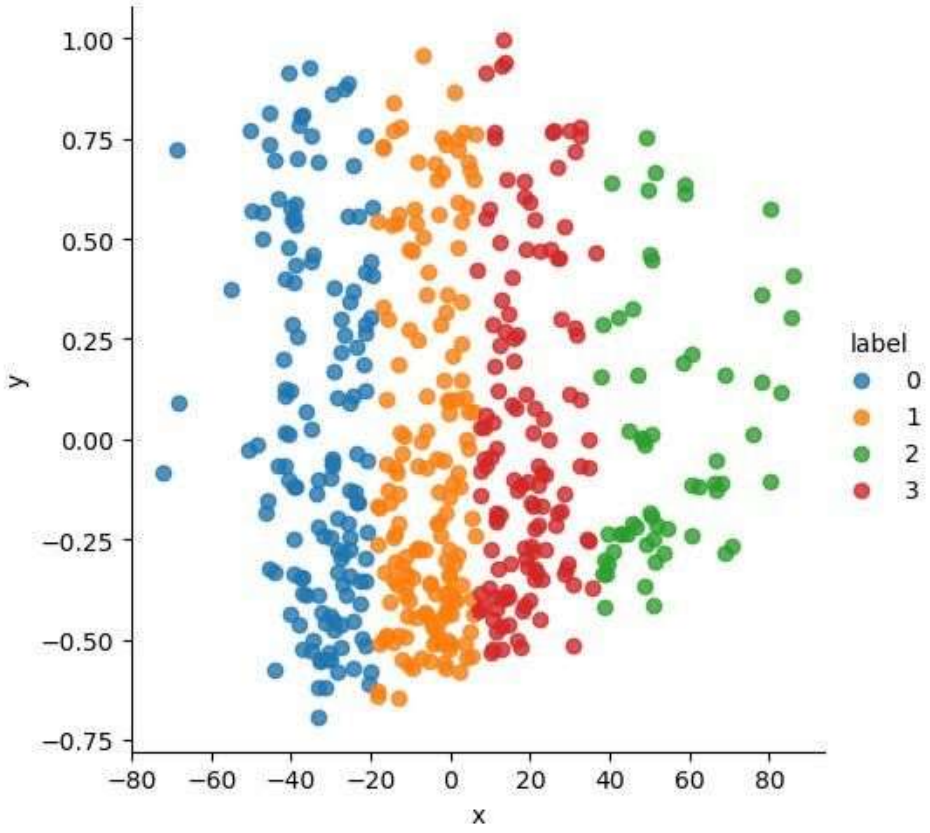
INTERACTIVITY

03

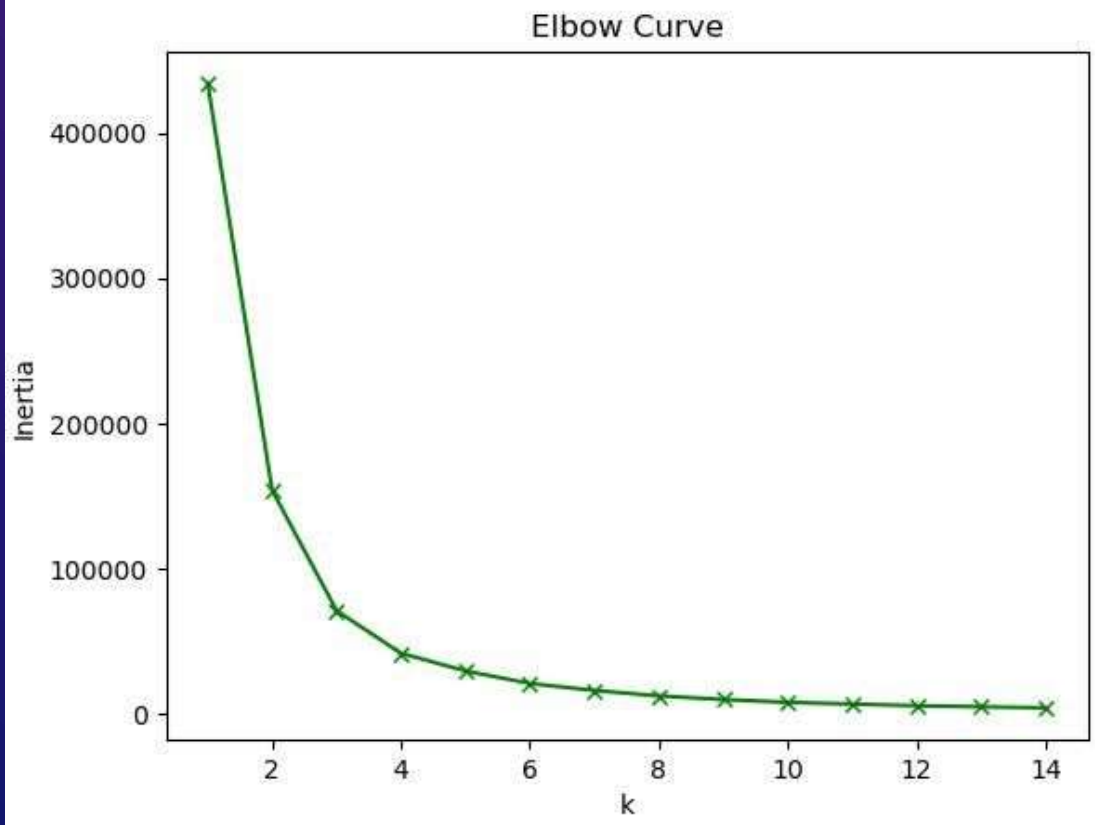
WHAT WE FOUND

```
#Plot pca data
df_pc = pd.DataFrame(principal_components)
df_pc['label'] = y_kmeans
df_pc.columns = ['x', 'y','label']


cluster = sns.lmplot(data=df_pc, x='x', y='y', hue='label', fit_reg=False, legend=True)
```



```
#Elbow method to find optimal K which comes to 4
plt.plot(K, inertia, 'gx-')
plt.xlabel('k')
plt.ylabel('Inertia')
plt.title('Elbow Curve')
plt.show()
```



```
songs_copy['label']= songs_copy['label'].map(str)
```

```
songs_copy.replace(to_replace="0", value="Sad", inplace=True)
```

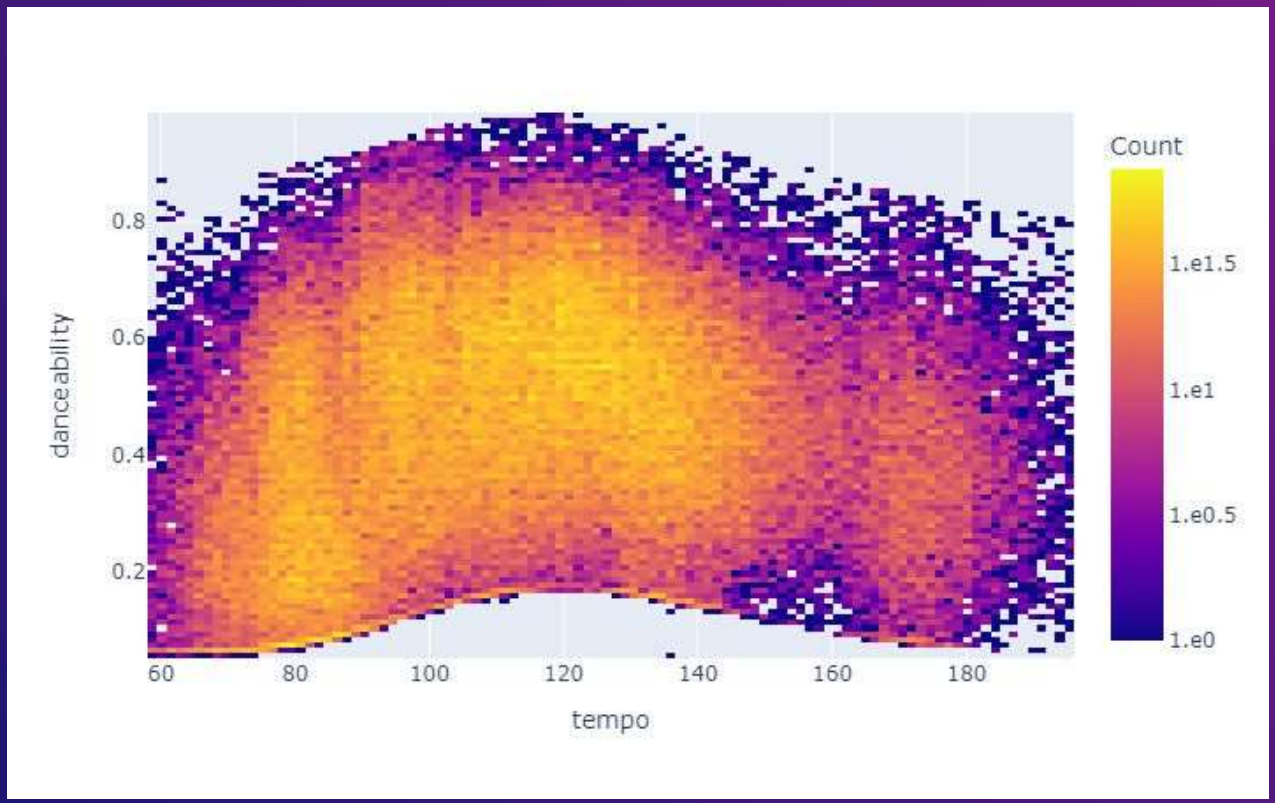
```
songs_copy.replace(to_replace="1", value="Calm", inplace=True)
```

```
songs_copy.replace(to_replace="2", value="Energetic", inplace=True)
```

```
songs_copy.replace(to_replace="3", value="Happy", inplace=True)
```

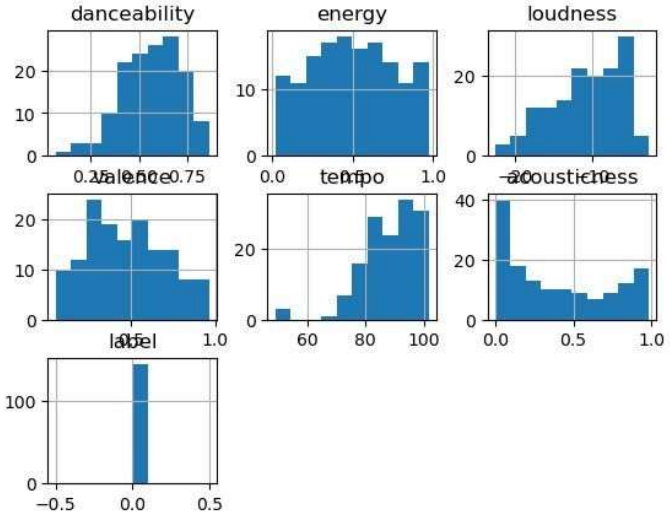
```
songs_copy.head(15)
```

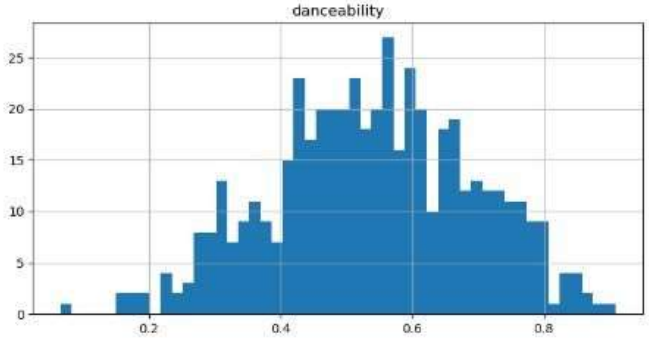
	id	danceability	energy	loudness	valence	tempo	acousticness	label
146	7qCU1BGUeMw09K9DdxXZOV	0.521	0.425	-11.943	0.4580	163.332	0.399000	Energetic
81	75qoLt38t0tJMfArhH8n0f	0.602	0.685	-6.690	0.5490	98.007	0.525000	Sad
398	1A0taWkwkAt7I0RL7Ja5yV	0.439	0.149	-15.917	0.2570	77.137	0.892000	Sad
137	3874Ac5TPH544Zdh06na1X	0.547	0.220	-15.942	0.1970	104.195	0.281000	Calm
401	2qxWOpejOG5sE6qmC9v9ER	0.561	0.116	-14.612	0.3500	123.225	0.848000	Calm
311	2Nvjix9YfXNgXoK6CyyiZm	0.319	0.596	-12.574	0.2860	130.125	0.005020	Happy
174	2A8T4JMQq1VAPZXqTHTYWs	0.364	0.921	-4.460	0.5880	118.088	0.001520	Calm
286	7nz5fzfhoEI7IQbKHI4jvx	0.622	0.596	-9.010	0.7400	89.517	0.240000	Sad
109	0YSYfKMk0JBI7mmWzSsfPe	0.843	0.693	-8.849	0.5380	91.804	0.475000	Sad
215	11CncGAYp8AHeZ1NVavXGy	0.503	0.836	-5.560	0.4610	107.415	0.185000	Calm
454	4WAMmqDol0S9z17F3JxQjQ	0.560	0.239	-16.732	0.6010	201.672	0.473000	Energetic
309	2Nf9tO72meJ0NPqvdSSWQv	0.231	0.738	-10.796	0.1960	140.800	0.000298	Happy
156	3gDe0R03dmJd4HqFihb0D4	0.625	0.676	-12.367	0.7620	144.527	0.461000	Happy
49	6AGrDsrNVFeTTI4sQHfqsY	0.417	0.365	-12.711	0.3070	172.692	0.741000	Energetic
366	31iMcUhWGu45qB4p43NOp9	0.365	0.185	-10.789	0.0898	152.464	0.674000	Happy

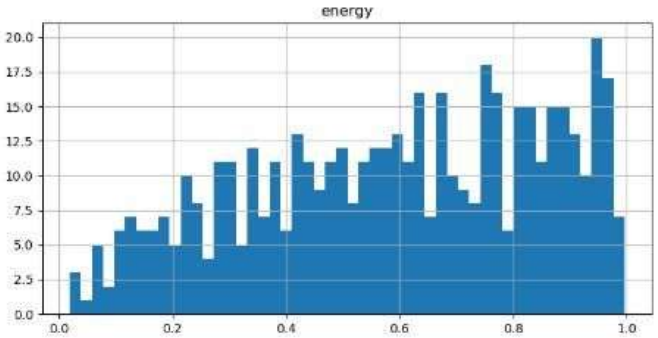

Count
1.e1.5
1.e1
1.e0.5
1.e0
danceability
0.8
0.6
0.4
0.2
60
80
100
120
140
160
180
tempo

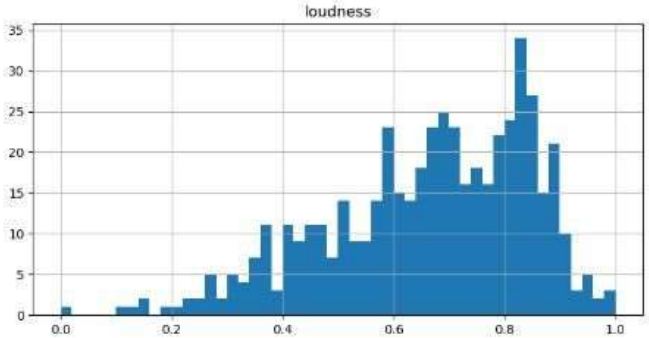
```
songs[songs['label']==0].hist()
```

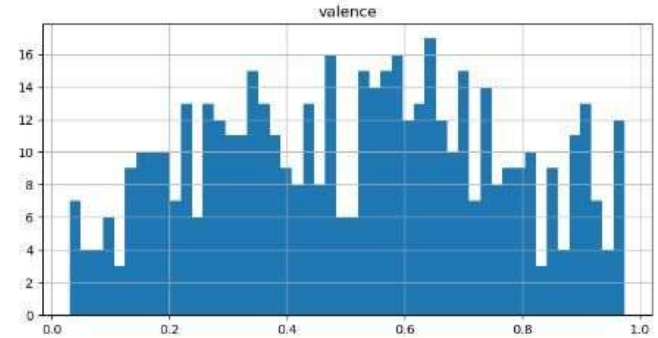
```
array([[<AxesSubplot:title={'center':'danceability'}>,
        <AxesSubplot:title={'center':'energy'}>,
        <AxesSubplot:title={'center':'loudness'}>],
       [<AxesSubplot:title={'center':'valence'}>,
        <AxesSubplot:title={'center':'tempo'}>,
        <AxesSubplot:title={'center':'acousticness'}>],
       [<AxesSubplot:title={'center':'label'}>, <AxesSubplot:>,
        <AxesSubplot:>]], dtype=object)
```

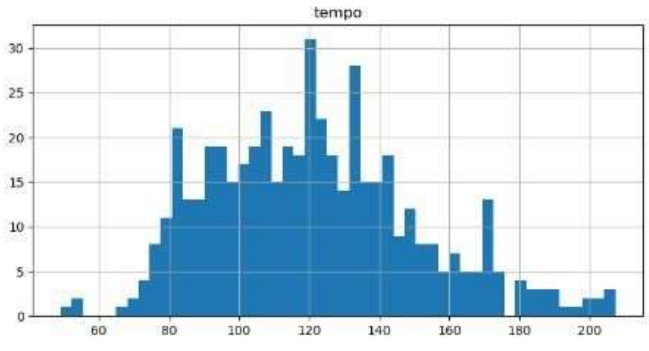


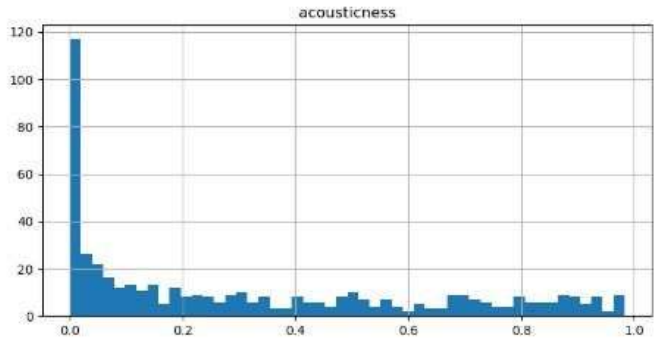

danceability

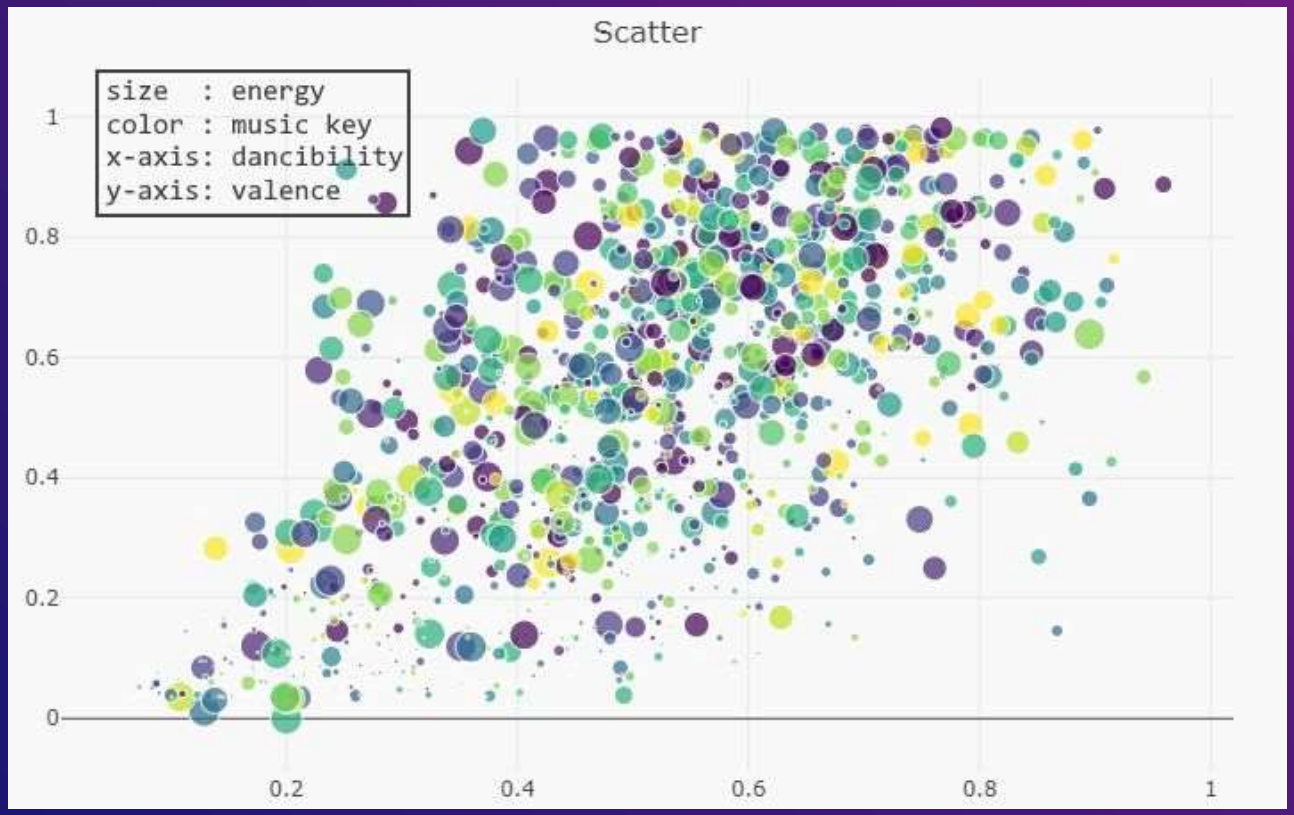

energy


loudness


valence


tempo


acousticness


Scatter
size : energy
color : music key
x-axis: dancibility
y-axis: valence
1
0.8
0.6
0.4
0.2
0
0.2
0.4
0.6
0.8
1

04

RESOURCES

RESOURCES/TECHNOLOGIES

SOURCE DATA

Kaggle: Spotify 1.2M+ Songs with track features

Obtained through the Spotify API

DATABASE MANAGEMENT

pgAdmin/postgreSQL
Python
VS Code
SQLAlchemy
Quick DBD for ERD development

VISUALIZATIONS

Google Slides
Javascript
Flask
Python
VS Code

ANALYSIS

Jupyter Notebook
Python

STORAGE

GitHub

DATA PREPROCESSING

Python
pgAdmin/postgreSQL

THANKS!

DO YOU HAVE ANY QUESTIONS?

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