

SPOTIFY WRAP

by ABHISHEK SHRESTHA

DATA VISUALIZATION CIS 4

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In [2]: `pip install spotify --upgrade #install spotify packages`

Requirement already up-to-date: spotify in /opt/anaconda3/lib/python3.8/site-packages (2.18.0)
Requirement already satisfied, skipping upgrade: backoff<2.25.0 in /opt/anaconda3/lib/python3.8/site-packages (from spotify) (2.25.1)
Requirement already satisfied, skipping upgrade: six>=1.15.0 in /opt/anaconda3/lib/python3.8/site-packages (from spotify) (1.15.0)
Requirement already satisfied, skipping upgrade: urllib3>=1.26.0 in /opt/anaconda3/lib/python3.8/site-packages (from spotify) (1.26.4)
Requirement already satisfied, skipping upgrade: idna<3,>=2.5 in /opt/anaconda3/lib/python3.8/site-packages (from requests>=2.25.0->spotify) (2.10)
Requirement already satisfied, skipping upgrade: chardet<5,>=3.0.2 in /opt/anaconda3/lib/python3.8/site-packages (from requests>=2.25.0->spotify) (3.0.4)
Requirement already satisfied, skipping upgrade: certifi>=2017.4.17 in /opt/anaconda3/lib/python3.8/site-packages (from requests>=2.25.0->spotify) (2020.6.20)
Note: you may need to restart the kernel to use updated packages.

In [3]: `pip install -U spotify #install spotify packages`

Requirement already up-to-date: spotify in /opt/anaconda3/lib/python3.8/site-packages (0.10.2)
Requirement already satisfied, skipping upgrade: backoff<2.0.0,>=1.10.0 in /opt/anaconda3/lib/python3.8/site-packages (from spotify) (1.10.0)
Requirement already satisfied, skipping upgrade: attr>=17.3.0 in /opt/anaconda3/lib/python3.8/site-packages (from aiohttp<4.0,>=3.6->spotify) (19.3.0)
Requirement already satisfied, skipping upgrade: chardet<5.0,>=2.0 in /opt/anaconda3/lib/python3.8/site-packages (from aiohttp<4.0,>=3.6->spotify) (5.1.0)
Requirement already satisfied, skipping upgrade: typing-extensions>=3.6.5 in /opt/anaconda3/lib/python3.8/site-packages (from aiohttp<4.0,>=3.6->spotify) (1.6.3)
Requirement already satisfied, skipping upgrade: async-timeout<4.0,>=3.0 in /opt/anaconda3/lib/python3.8/site-packages (from aiohttp<4.0,>=3.6->spotify) (2.10)
Requirement already satisfied, skipping upgrade: idna>=2.0 in /opt/anaconda3/lib/python3.8/site-packages (from yarl<2.0,>=1.0->aiohttp<4.0,>=3.6->spotify) (2.10)
Note: you may need to restart the kernel to use updated packages.

In [4]: `pip install -U git+https://github.com/mental32/spotify.py #egg=spotify`

Collecting git+https://github.com/mental32/spotify.py
Cloning https://github.com/mental32/spotify.py to /private/var/folders/pw/_6jq7ls25j338ppymdlzg8c000gn/7/pip-res-bu1ld-2t7xxqs
Running command git clone --https://github.com/mental32/spotify.py /private/var/folders/pw/_6jq7ls25j338ppymdlzg8c000gn/7/pip-res-bu1ld-2t7xxqs
Installing build dependencies ... done
Getting requirements to build wheel ... done
Preparing wheel metadata ... done
Requirement already satisfied, skipping upgrade: aiohttp<4.0,>=3.6 in /opt/anaconda3/lib/python3.8/site-packages (from spotify==0.10.2) (3.7.4.post0)
Requirement already satisfied, skipping upgrade: backoff<2.0.0,>=1.10.0 in /opt/anaconda3/lib/python3.8/site-packages (from aiohttp<4.0,>=3.6->spotify) (1.10.0)
Requirement already satisfied, skipping upgrade: multidict<7.0,>=4.5 in /opt/anaconda3/lib/python3.8/site-packages (from aiohttp<4.0,>=3.6->spotify) (4.7.4.2)
Requirement already satisfied, skipping upgrade: yarl<2.0,>=1.0 in /opt/anaconda3/lib/python3.8/site-packages (from aiohttp<4.0,>=3.6->spotify) (1.6.3)
Requirement already satisfied, skipping upgrade: async-timeout<4.0,>=3.0 in /opt/anaconda3/lib/python3.8/site-packages (from aiohttp<4.0,>=3.6->spotify) (2.10)
Requirement already satisfied, skipping upgrade: attr>=17.3.0 in /opt/anaconda3/lib/python3.8/site-packages (from aiohttp<4.0,>=3.6->spotify) (19.3.0)
Requirement already satisfied, skipping upgrade: yarl<2.0,>=1.0 in /opt/anaconda3/lib/python3.8/site-packages (from aiohttp<4.0,>=3.6->spotify) (1.6.3)
Requirement already satisfied, skipping upgrade: idna>=2.0 in /opt/anaconda3/lib/python3.8/site-packages (from yarl<2.0,>=1.0->aiohttp<4.0,>=3.6->spotify) (2.10)
Building wheel for spotify (PEP 517) ... done
Created wheel for spotify: filename=spotify-0.10.2-py3-none-any.whl size=49752 sha256=f7385d1b66b87676e1a1c8c232ee22d691b3b4bc4ace1f40dbcfaf67939
Stored in directory: /private/var/folders/pw/_6jq7ls25j338ppymdlzg8c000gn/7/pip-ephem-wheel-cache-86q5w6ry/wheels/25/d6/5a/d284f69ea92284c93647d0998504cb196019661f1d33b0c8493
Successfully built spotify
Installing collected packages: spotify
Attempting uninstall: spotify
Found existing installation: spotify 0.10.2
Uninstalling spotify==0.10.2:
Successfully uninstalled spotify-0.10.2
Successfully installed spotify-0.10.2
Note: you may need to restart the kernel to use updated packages.

In [5]: `import pandas as pd
import numpy as np
import json
import time
from datetime import timedelta`

In [6]: `import matplotlib.pyplot as plt
import seaborn as sns`

In [7]: `import spotify as sx
from plotly.offline import download_plotlyjs, init_notebook_mode, plot, iplot
init_notebook_mode(connected=True)
import plotly.graph_objs as go`

In [8]: `#import webbrowser`

`import spotify_util as util
from spotify_oauth2 import SpotifyClientCredentials
import spotify_sync as spotify`

Importing JSON file to a DataFrame

In [9]: `#Import the data from a json file`

`with open('streamingHistory0.json', encoding='utf8') as f: data = json.load(f)`

`print(data[1:1])`

`['endTime': '2020-05-09 00:00:', 'artistName': 'Alessia Cara', 'trackName': 'Out Of Love', 'msPlayed': 815141]`

In [10]: `#Convert from json to a dataframe`

`streamingHistory0 = pd.DataFrame()`

`def extract_json_value(column_name):
 return [i[column_name] for i in data]`

`streamingHistory0['artist_name'] = extract_json_value('artistName')`

`streamingHistory0['track_name'] = extract_json_value('trackName')`

`streamingHistory0['ms_played'] = extract_json_value('msPlayed')`

`streamingHistory0['end_time'] = extract_json_value('endTime')`

In [11]: `streamingHistory0.info()`

`<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10000 entries, 0 to 9999
Data columns (total 4 columns):
column Non-Null Count Dtype --- --- ---
0 artist_name 10000 non-null object
1 track_name 10000 non-null object
2 ms_played 10000 non-null int64
3 end_time 10000 non-null object
dtypes: int64(1), object(3)
memory usage: 312.6+ KB`

In [12]: `#Import the data from a json file`

`with open('streamingHistory1.json', encoding='utf8') as f: data = json.load(f)`

`print(data[1:1])`

`['endTime': '2020-08-13 12:47:', 'artistName': 'Roddy Rich', 'trackName': 'The Box', 'msPlayed': 815141]`

In [13]: `#Convert from json to a dataframe`

`streamingHistory1 = pd.DataFrame()`

`def extract_json_value(column_name):
 return [i[column_name] for i in data]`

`streamingHistory1['artist_name'] = extract_json_value('artistName')`

`streamingHistory1['track_name'] = extract_json_value('trackName')`

`streamingHistory1['ms_played'] = extract_json_value('msPlayed')`

`streamingHistory1['end_time'] = extract_json_value('endTime')`

In [14]: `streamingHistory1.info()`

`<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10000 entries, 0 to 9999
Data columns (total 4 columns):
column Non-Null Count Dtype --- --- ---
0 artist_name 10000 non-null object
1 track_name 10000 non-null object
2 ms_played 10000 non-null int64
3 end_time 10000 non-null object
dtypes: int64(1), object(3)
memory usage: 312.6+ KB`

In [15]: `#Import the data from a json file`

`with open('streamingHistory2.json', encoding='utf8') as f: data = json.load(f)`

`print(data[1:1])`

`['endTime': '2021-03-20 23:11:', 'artistName': 'BIA', 'trackName': 'FREE BIA (1ST DAY OUT)', 'msPlayed': 27301]`

In [16]: `#Convert from json to a dataframe`

`streamingHistory2 = pd.DataFrame()`

`def extract_json_value(column_name):
 return [i[column_name] for i in data]`

`streamingHistory2['artist_name'] = extract_json_value('artistName')`

`streamingHistory2['track_name'] = extract_json_value('trackName')`

`streamingHistory2['ms_played'] = extract_json_value('msPlayed')`

`streamingHistory2['end_time'] = extract_json_value('endTime')`

In [17]: `streamingHistory2.info()`

`<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6901 entries, 0 to 6900
Data columns (total 4 columns):
column Non-Null Count Dtype --- --- ---
0 artist_name 6901 non-null object
1 track_name 6901 non-null object
2 ms_played 6901 non-null int64
3 end_time 6901 non-null object
dtypes: int64(1), object(3)
memory usage: 215.8+ KB`

Merging Three Data Sets

In [18]: `streamingHistory = streamingHistory0.append(streamingHistory1).append(streamingHistory2)`

Out [19]: `streamingHistory`

`Out[19]:`

	artist_name	track_name	ms_played	end_time
0	Alessia Cara	Out Of Love	2922	2020-05-09 00:00:00
1	rum.gold	Save You	112725	2020-05-09 00:00:00
2	Lewis Capaldi	Bruises	5942	2020-05-09 00:02:00
3	XXXENTACION	Everybody Dies In Their Nightmares	95466	2020-05-09 00:02:00
4	Calum Scott	Dancing On My Own	618	2020-05-09 00:02:00
...
6896	Sushant KC	Sahi	215073	2021-05-09 22:48
6897	Sushant KC	Satayara	224396	2021-05-09 22:52
6898	Sushant KC	Mausam	199466	2021-05-09 22:55
6899	Sushant KC	Satayara	373666	2021-05-09 23:02
6900	Sushant KC	Mausam	161535	2021-05-09 23:04

26901 rows x 4 columns

To Time Stamp format

In [20]: `#Converting end_time to timestamp format`

`streamingHistory['end_time'] = pd.to_datetime(streamingHistory['end_time'])`

`streamingHistory.head(5)`

Out [20]:

`Out[20]:`

	artist_name	track_name	ms_played	end_time
0	Alessia Cara	Out Of Love	2922	2020-05-09 00:00:00
1	rum.gold	Save You	112725	2020-05-09 00:00:00
2	Lewis Capaldi	Bruises	5942	2020-05-09 00:02:00
3	XXXENTACION	Everybody Dies In Their Nightmares	95466	2020-05-09 00:02:00
4	Calum Scott	Dancing On My Own	618	2020-05-09 00:02:00
5	Alessia Cara	Out Of Love	2922	2020-05-09 00:02:00

In [21]: `streamingHistory.dtypes`

Out [21]:

`Out[21]:`

	artist_name	track_name	ms_played	end_time
0	Alessia Cara	Out Of Love	2922	2020-05-09 00:00:00
1	rum.gold	Save You	112725	2020-05-09 00:00:00
2	Lewis Capaldi	Bruises	5942	2020-05-09 00:02:00
3	XXXENTACION	Everybody Dies In Their Nightmares	95466	2020-05-09 00:02:00
4	Calum Scott	Dancing On My Own	618	2020-05-09 00:02:00

Converting end_time to Week Days

In [26]: `def get_week_endpoints(df):
 days = df['end_time'].weekday()
 week_start = df['end_time'] - timedelta(days=days)
 week_end = week_start + timedelta(days=6)
 ['Week'] = str(week_start.strftime('%Y/%m/%d')) + ' - ' + str(week_end.strftime('%Y/%m/%d'))
 return df`

In [27]: `#streamingHistory['week'] = streaming_hist['endTime'].dt.week
streamingHistory = streamingHistory.groupby(['week'], as_index=False)[['ms_played']].agg(sum)
streamingHistory['mean'] = np.mean(streamingHistory.ms_played)`

In [28]: `streamingHistory = streamingHistory.groupby(by=['week'], as_index=False)[['ms_played']].agg(sum)
streamingHistory['mean'] = np.mean(streamingHistory.ms_played)`

In [29]: `import matplotlib.pyplot as plt`

In [32]: `def count_avg_plot(df, X, Y, title, Z=None):
 ax = df.plot(x=X, y=Y, legend=False, figsize=(15,10), fontsize=12, title=title, rot=45, marker='o')
 ax.grid(True)
 ax.set_ylabel(Y)
 #ax.annotate("Point 1", (43, 91249856))
 #ax.annotate("Average Minutes Played",horizontalalignment='right', fontsize = 'small')
 ax.title.set_size(20)
 if Z:
 ax2 = ax.twinx()
 ax2.set_ylabel(Z)
 df.plot(x=X, y=Z, ax=ax2, legend=False, color='r', linestyle='--', fontsize=15).grid(False)
 ax2.get_yaxis().set_visible(False)
 ax.figure.legend(loc=4)
 #ax.xticks(fontsize=14)
 plt.show()`

In [33]: `count_avg_plot(streamingHistory, 'Week', 'ms_played', 'Streaming History 2020-2021', 'mean')`



Separating types into Music or Podcast

In [34]: `streamingHistory = streamingHistory[streamingHistory.ms_played > 10000]`

Out [35]: `streamingHistory.sort_values(by=['end_time', ascending=True].head(10)
streamingHistory['end_time'] = pd.to_datetime(streamingHistory['end_time'] > '2020-03-11')
regular = streamingHistory.loc[streamingHistory.end_time < '2020-03-11']`

In [36]: `pods = np.unique(quantarine[quantarine.ms_played > 720000]['artist_name'])
quantarine['Type'] = np.where(quantarine.artist_name.isin(pods), 'Podcast', 'Music')`

In [37]: `for val in pods:
 print(val)`

21 Savage
6LACK
Alex Rose
Behind The Peaks Podcast
Between Good & Evil
Bore You To Sleep - Sleep Stories for Adults
Call Me Daddy
Canada Soccer Nation Podcast
Chilling Tales for Dark Nights: A Horror Anthology and Scary Stories Series Podcast
Creepy
Dark Histories
Dr. Ramdesh
Duncan Trussell Family Hour
Female Criminals
Future
GRM Daily
Get Sleepy: Sleep meditation and stories
Gianni
Guided Sleep Meditations
Guns
H3 Podcast
History Hyenas with Chris Distefano and Yannis Pappas
Huncho Jack
In Remembrance of John Lewis
Joe rogan
Lil Baby
Migos
Mithoon
Morbid: A True Crime Podcast
Nightmare Society
Nothing much happens: bedtime stories to help you sleep
Pop Smoke
Raveena
TED Radio Hour
Tales
The Joe Rogan Experience
The Michelle Obama Podcast
The NoSleep Podcast
The Official Fantasy Premier League Podcast
The Psychology Podcast with Scott Barry Kaufman
The Tiny Meat Gang Podcast
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The Michelle Obama Podcast
The NoSleep Podcast
The Official Fantasy Premier League Podcast
The Psychology Podcast with Scott Barry Kaufman
The Tiny Meat Gang Podcast
Therapy for Black Girls
Sleep Tight Stories - Bedtime Stories For Kids
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```
'Stunna 4 Vegas',
'Sublime',
'Summer Walker',
'Surf Curse',
'Sushant KC',
'Sean Lee',
'Swifta Beater',
'Sybyr',
'Sérgio Mendes',
'T.I.',
'T9ine',
'TEK LOK',
'THE SCOTTS',
'TJ Porter',
'TJC',
'TOKYO'S REVENGE',
'TWENTY88',
'Tainy',
'Tate',
'Takeover',
'Tame Impala',
'Tanishk Bagchi',
'Tayliah',
'Taylor Swift',
'Tee Grizzley',
'The Chainsmokers',
'The Cranberries',
'The Eddy',
'The Game',
'The Honest Guys',
'The Internet',
'The King Cody',
'The Kuls',
'The Lumineers',
'The Notorious B.I.G.',
'The Plug',
'The Shacks',
'The Smiths',
'The Strokes',
'The Uglyz',
'The Walden Brothers',
'The Weeknd',
'Therapy Cat',
'Thundercat',
'TiaCorine',
'Tremzi',
'Tibetan Singing Bowls',
'Tierra Whack',
'Tiger Gooda',
'TiHabee',
'Tinie Tempah',
'Tink',
'Tion Wayne',
'Tiwa Savage',
'Tizzy Tackz',
'Tokyo Jeta',
'Tom Misch',
'Tom Zanetti',
'Tommy',
'Tompson',
'Toscaii',
'Topic',
'Tori',
'Tory Lanez',
'Tove Lo',
'Towerz',
'Tradic',
'Trae Tha Truth',
'Travis Scott',
'Treasure',
'Trevor Daniel',
'Trey Songz',
'Trippie Redd',
'Trizac',
'Troy Ave',
'Turbo',
'Ty Dolla Sign',
'TyDaGod',
'Tyga',
'Tyke Yaweh',
'Tyler, The Creator',
'URNNR',
'UML',
'Ufo361',
'UK Drill',
'Unknown Artist',
'Unknown T',
'UnoTheActivist',
'Urgent Care with Joel Kim Booster + Mitra Jouhari',
'Useni',
'VTEH',
'Valee',
'Vedo',
'Vegdream',
'Vek',
'Victor Internet',
'Victoria Monet',
'Vince Staples',
'Vishai-Shekhar',
'WESTSIDE BOOGIE',
'WILLOW',
'WSJ Minute Briefing',
'Waka Flocka Flame',
'Wale',
'Wavy Navy Fooh',
>Welcome to Night Vale',
'Wet',
'Whitney Houston',
'Wifisfuneral',
'Wiz Khalifa',
'Wizkid',
'Wolftyla',
'XXXTENTACION',
'Y2k',
'Y2K',
'YBN Nahmir',
'YBN Lucci',
'YG',
'YK Osiris',
'YN Lay',
'YNN Melly',
'YNN Plow',
'Yabesh Thapa',
'Yame Buddha',
'Yebba',
'Yella Beery',
'Yellow Claw',
'Yo Gotti',
'Yodda',
'Young Dolph',
'Young M.A',
'Young Money',
'Young Nudy',
'Young Stoner Life',
'Young T & Bugsey',
'Young Thug',
'YoungBoy Never Broke Again',
'Youngn Lips',
'Younge Teflon',
'Yung Baby Tate',
'Yung Bee',
'Yung Bans',
'Yung Bleu',
'Yung Fume',
'Yung Tocy',
'Yungeen Ace',
...])
```

```
In [42]: quarantine[quarantine.artist_name.isin(new discoveries_music)]\
groupby(by='artist_name', as_index=False)['ms_played'].agg(sum).sort_values(by='ms_played', ascending
=False).head(10)
```

	artist_name	ms_played
236	Drake	174508303
873	LMI	84831773
429	Jhene Aiko	76911371
895	The Weeknd	58734006
922	Travis Scott	52929333
848	Sushant KC	39829733
989	Young Thug	38314030
270	Don Toliver	3341221
846	Summer Walker	32390539
771	SAINN JHN	32103038

```
In [43]: new_pods = [artist for artist in qtime_pods if artist not in regular_pods]
len(new_pods)
```

```
Out [43]: 55
```

```
In [44]: quarantine
```

	artist_name	track_name	ms_played	end_time	Week	Type
1	rum.gold	Save You	112725	2020-05-09 00:00:00	2020/05/04 - 2020/05/10	Music
3	XXXTENTACION	Everybody Dies In Their Nightmares	95466	2020-05-09 00:02:00	2020/05/04 - 2020/05/10	Music
11	Clairo	Pretty Girl	98432	2020-05-09 00:04:00	2020/05/04 - 2020/05/10	Music
12	girl in red	we fell in love in october	68071	2020-05-09 00:05:00	2020/05/04 - 2020/05/10	Music
13	Cuco	Lover Is a Day	85860	2020-05-09 00:06:00	2020/05/04 - 2020/05/10	Music
...
6896	Sushant KC	Sathi	215073	2021-05-09 22:48:00	2021/05/03 - 2021/05/09	Music
6897	Sushant KC	Satayara	224396	2021-05-09 22:52:00	2021/05/03 - 2021/05/09	Music
6898	Sushant KC	Mausam	195466	2021-05-09 22:55:00	2021/05/03 - 2021/05/09	Music
6899	Sushant KC	Satayara	373366	2021-05-09 23:02:00	2021/05/03 - 2021/05/09	Music
6900	Sushant KC	Mausam	161535	2021-05-09 23:04:00	2021/05/03 - 2021/05/09	Music

17352 rows x 6 columns

```
In [45]: quarantine.head()
```

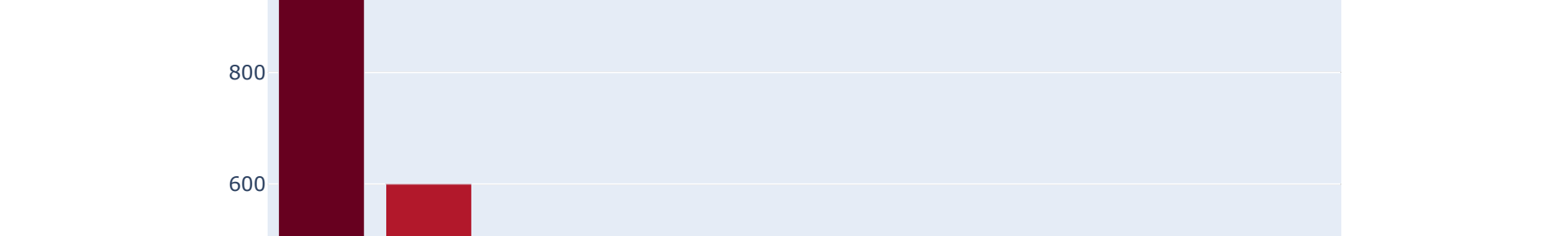
	artist_name	track_name	ms_played	end_time	Week	Type
1	rum.gold	Save You	112725	2020-05-09 00:00:00	2020/05/04 - 2020/05/10	Music
3	XXXTENTACION	Everybody Dies In Their Nightmares	95466	2020-05-09 00:02:00	2020/05/04 - 2020/05/10	Music
11	Clairo	Pretty Girl	98432	2020-05-09 00:04:00	2020/05/04 - 2020/05/10	Music
12	girl in red	we fell in love in october	68071	2020-05-09 00:05:00	2020/05/04 - 2020/05/10	Music
13	Cuco	Lover Is a Day	85860	2020-05-09 00:06:00	2020/05/04 - 2020/05/10	Music

```
In [46]: group_type = quarantine.groupby(by='Type', as_index=False)['ms_played'].agg(sum)
group_type
```

	Type	ms_played
0	Music	2349789563
1	Podcast	663977874

Music v. Podcast

```
In [47]: labels = ['Music', 'Podcast']
sizes = [2349789563, 663977874]
explode = (0, 0.1) # only "explode" the 2nd slice (i.e. 'Podcast')
```



Popularity of artist based on the number of times their songs were clicked and played

```
In [74]: most_played_artists_by_count = streamingHistory.groupby(by='artist_name')['track_name'].count().sort_va
lues(ascending=False)[:10]
print('The most popular artists by number of times their songs were played were: \n\n').format(most_pl
ayed_artists_by_count))
```

The most popular artists by number of times their songs were played were:

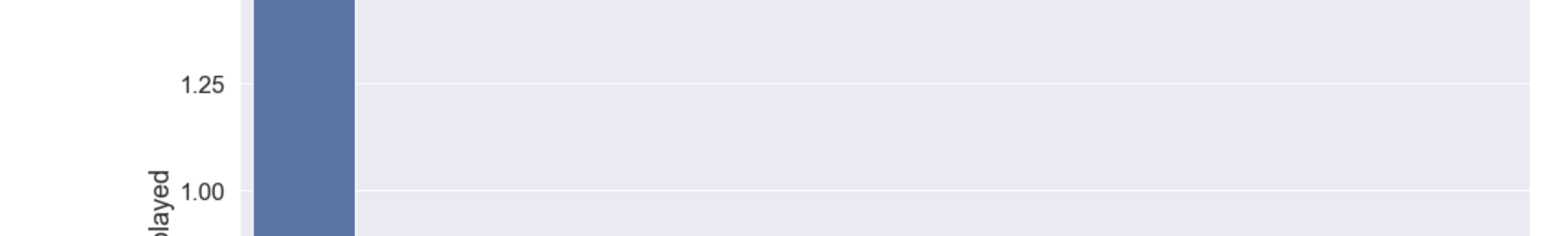
artist_name	count
Drake	961
UMI	600
Jhene Aiko	463
Pop Smoke	411
Raveena	379
6LACK	323
Lil Baby	308
Travis Scott	297
The Weeknd	293
Summer Walker	235

Name: track_name, dtype: int64

```
In [49]: colors = ['RGB(103, 0, 31)', 'RGB(178, 24, 43)', 'RGB(214, 96, 77)', 'RGB(244, 165, 130)', 'RGB(253, 219, 1
99)',
'RGB(247, 247, 247)', 'RGB(209, 239, 240)', 'RGB(146, 197, 222)', 'RGB(67, 147, 195)', 'RGB(33, 1
02, 172)',
'RGB(5, 48, 97)']
```

```
layout = go.Layout(
    title='Popularity Of Artists By Number Of Times Their Song Was Played',
    yaxis= dict(
        title='Number of Times Played',
        gridcolor='rgb(255, 255, 255)',
        zerolinewidth=1,
        ticklen=5,
        gridwidth=2,
        titlefontdict=dict(size=15)),
    xaxis=dict(title='Artist Name'))
```

```
fig = go.Figure(data=[go.Bar(x=most_played_artists_by_count.index,
y=most_played_artists_by_count,
textposition='auto',
opacity=1,
marker_color=colors)])
fig.show()
```



Top Streamed Artists

```
In [50]: sum(quarantine['ms_played']/60000)
```

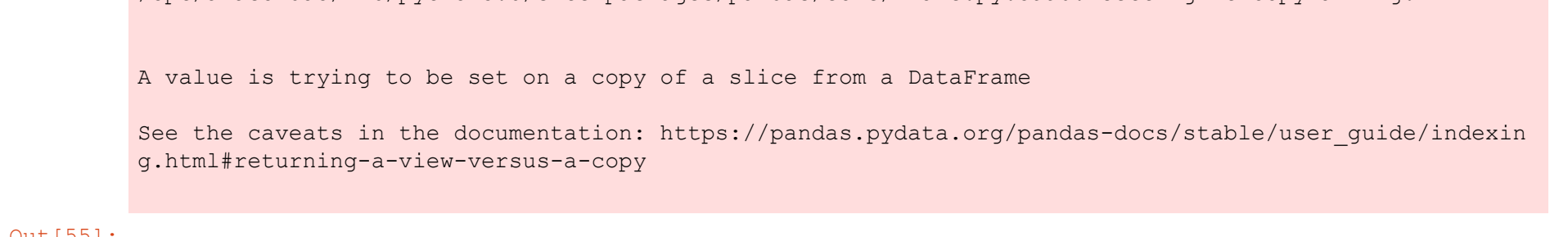
```
Out [50]: 50229.45895
```

```
In [51]: quarantine_music = quarantine[quarantine.Type.isin(['Music'])]
```

```
In [52]: artists = quarantine_music.groupby(['artist_name'], as_index=False)['ms_played'].agg(sum).\
sort_values(by='ms_played', ascending=False).head(10)
```

```
In [53]: import seaborn as sns
sns.set(rc={'figure.figsize': (16,10)})
sns.set(style='whitegrid')
sns.set(font_scale=1.5)
g = sns.barplot(x='artist_name', y='ms_played', data=artists)
g.set_title('Top Streamed Artists')
g.set_xticklabels(g.get_xticklabels(), rotation=30)
```

```
Out [53]: [Text(0, 0, 'Drake'),
Text(0, 0, 'UMI'),
Text(0, 0, 'Jhene Aiko'),
Text(0, 0, 'The Weeknd'),
Text(0, 0, 'Travis Scott'),
Text(0, 0, 'Sushant KC'),
Text(0, 0, 'Young Thug'),
Text(0, 0, 'Don Toliver'),
Text(0, 0, 'Summer Walker'),
Text(0, 0, 'SAINN JHN')]
```



Top Artist

```
In [54]: artist = streamingHistory0.append(streamingHistory1).append(streamingHistory2)
artist['minutes_played'] = artist.ms_played.divide(60000)
artist.drop('ms_played', axis=1, inplace=True)
artist.drop('end_time', axis=1, inplace=True)
artist.head()
```

```
Out [54]:
```

	artist_name	track_name	minutes_played
0	Alessia Cara	Out Of Love	0.048700
1	rum.gold	Save You	1.878750
2	Lewis Capaldi	Bruises	0.099033
3	XXXTENTACION	Everybody Dies In Their Nightmares	1.591100
4	Calum Scott	Dancing On My Own	0.010300

```
In [55]: artist_1 = artist.drop_duplicates(subset = ['track_name'])
artist_1.drop('minutes_played', axis=1, inplace=True)
artist_1
```

```
Out [55]:
```

	artist_name	track_name
0	Alessia Cara	Out Of Love
1	rum.gold	Save You
2	Lewis Capaldi	Bruises
3	XXXTENTACION	Everybody Dies In Their Nightmares
4	Calum Scott	Dancing On My Own
...
6434	Curren\$y	The Count (feat. Wiz Khalifa)
6588	Col Leray	Slide (with Gunna)
6599	Col Leray	I Like It (feat. Kiara Leids & Seyv Streeter)
6696	D-Block Europe	Ferrari Horses
6697	Ghost Killer Track	Tonight (feat. D-Block Europe & OBOY)

5839 rows x 2 columns

```
In [56]: artist_1 = artist_1.groupby(['artist_name'], as_index = False).count()
artist_1
```

	artist_name	track_name
0	SNOT	3
1	Steven Cannon	1
2	wildelkey	4
3	O3 Greedo	4
4	O70 Shake	1
...
1461	will hyde	1
1462	will.iam	1
1463	young lama	1
1464	zenorachi	2
1465	Edith Piaf	1

1466 rows x 2 columns

```
In [57]: artist_1 = artist_1.rename(columns={'track_name': 'unique_songs'})
artist_1.head()
```

	artist_name	unique_songs
0	SNOT	3
1	Steven Cannon	1
2	wildelkey	4
3	O3 Greedo	4
4	O70 Shake	1
...
1461	will hyde	1
1462	will.iam	1
1463	young lama	1
1464	zenorachi	2
1465	Edith Piaf	1

time = artist.groupby(['artist_name'], as_index=False).sum()

```
Out [58]:
```

	artist_name	minutes_played
0	SNOT	14.777000
1	Steven Cannon	3.151233
2	wildelkey	0.857233
3	O3 Greedo	15.945000
4	O70 Shake	3.586833

Top 10 Artist based on Unique Songs

```
In [59]: artist = pd.merge(song_artist, song, on='artist_name')
song_artist = top_artist.sort_values(by='unique_songs', ascending=False).head(10)
top_artist
```

```
Out [59]:
```

	artist_name	unique_songs	minutes_played
381	Drake	160	2925.390167
475	Future	80	519.657750
1289	The Weeknd	75	983.892767
890	NAV	67	388.434050
1005	Pop Smoke	64	1054.344450
12	21 Savage	64	162.901417
739	Lana Del Rey	63	433.674817
688	Lil Uzi Vert	63	267.742200
702	Jhene Aiko	57	1289.407400
1325	Travis Scott	54	925.225517

```
In [60]: fig = px.scatter(top_artist, x='artist_name', y='minutes_played', title='Top 10 of Most Played Artists
by Songs', size='unique_songs', color_discrete_sequence=px.colors.sequential.RdBu)
fig.show()
```



Most listened to Song

```
In [75]: song = streamingHistory0.append(streamingHistory1).append(streamingHistory2)
song['minutes_played'] = song.ms_played.divide(60000)
song.drop('ms_played', axis=1, inplace=True)
song
```

```
Out [75]:
```

	artist_name	track_name	end_time	minutes_played
0	Alessia Cara	Out Of Love	2020-05-09 00:00	0.048700
1	rum.gold	Save You	2020-05-09 00:00	1.878750
2	Lewis Capaldi	Bruises	2020-05-09 00:02	0.099033
3	XXXTENTACION	Everybody Dies In Their Nightmares	2020-05-09 00:02	1.591100
4	Calum Scott	Dancing On My Own	2020-05-09 00:02	0.010300
...
6896	Sushant KC	Sathi	2021-05-09 22:48	3.584550
6897	Sushant KC	Satayara	2021-05-09 22:52	3.739933
6898	Sushant KC	Mausam	2021-05-09 22:55	3.324433
6899	Sushant KC	Satayara	2021-05-09 23:02	6.222767
6900	Sushant KC	Mausam	2021-05-09 23:04	2.692250

26901 rows x 4 columns

```
In [62]: song = song.groupby(['track_name'], as_index=False).sum()
song = song.sort_values(by='minutes_played', ascending=False)
song
```

```
Out [62]:
```

	track_name	minutes_played
1979	Good Days	309.695083
1932	Glock Six - Bonus	224.378750
5182	Trisha & Ethan Do Oddly Satisfying Trends - Ft...	207.515317
2167	Headaches	201.739267
2545	Jake Paul, Wendy Williams, Bhad Bhabie & Dr. P...	197.453467
...
3482	No cap 2	0.000000
1533	Enna Sona From "OK Jaanu"	0.000000
1532	Enna Sona	0.000000
3516	Now & Forever	0.000000
715	Black Joe Dirt	0.000000

5839 rows x 2 columns

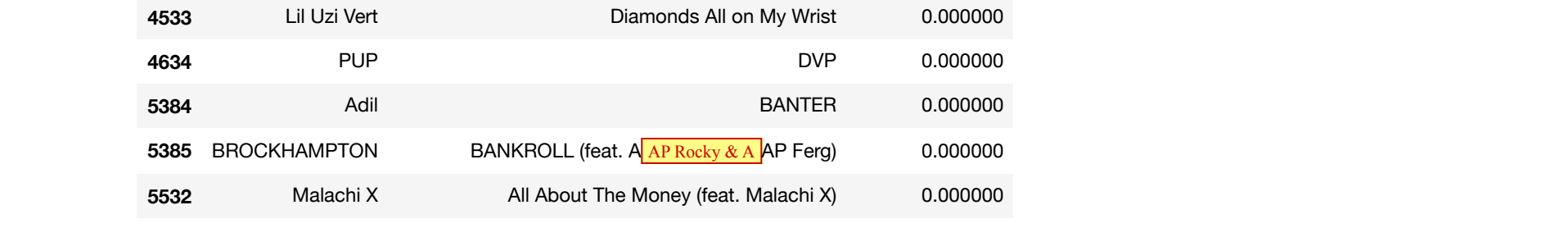
```
In [63]: song = pd.merge(song_artist, song, on='track_name')
song_artist = song.sort_values(by='minutes_played', ascending=False)
song
```

```
Out [63]:
```

	artist_name	track_name	minutes_played
0	SZA	Good Days	309.695083
1	6LACK	Glock Six - Bonus	224.378750
2	H3 Podcast	Trisha & Ethan Do Oddly Satisfying Trends - Fr...	207.515317
3671	Raveena	Headaches	201.739267
4	H3 Podcast	Jake Paul, Wendy Williams, Bhad Bhabie & Dr. P...	197.453467
5	Future	Solitaires (feat. Travis Scott)	184.761733
6	Alex Rose	Darte Remix	169.738067
7	Sushant KC	Satayara	169.697950
8	Sushant KC	Mausam	162.783183
9	GRM Daily	Moving Naughty (feat. Alitz & B Young)	160.474500
10	Raveena	If Only	160.305100
11	Raveena	Honey	159.562217
12	Q9914	Okinaa	157.316367
13	Drake	From Time	154.523783
14	N.Award	Tsunami	145.799017
15	Travis Scott	CANT SAY	134.895617

Top 15 Songs listened to

```
In [67]: fig = px.bar(song, x='track_name', y='minutes_played', title = 'Song Listened to the Most', color = "ar
tist_name", size='unique_songs', color_discrete_sequence=px.colors.sequential.RdBu)
fig.show()
```



```
In [68]: #Top 50 Songs
top_50 = streamingHistory0.append(streamingHistory1).append(streamingHistory2)
top_50['minutes_played'] = top_50.ms_played.divide(60000)
top_50.drop('ms_played', axis=1, inplace=True)
top_50
```

```
Out [68]:
```

	artist_name	track_name	end_time	minutes_played
0	Alessia Cara	Out Of Love	2020-05-09 00:00	0.048700
1	rum.gold	Save You	2020-05-09 00:00	1.878750
2	Lewis Capaldi	Bruises	2020-05-09 00:02	0.099033
3	XXXTENTACION	Everybody Dies In Their Nightmares	2020-05-09 00:02	1.591100
4	Calum Scott	Dancing On My Own	2020-05-09 00:02	0.010300
...
6896	Sushant KC	Sathi	2021-05-09 22:48	3.584550
6897	Sushant KC	Satayara	2021-05-09 22:52	3.739933
6898	Sushant KC	Mausam	2021-05-09 22:55	3.324433
6899	Sushant KC	Satayara	2021-05-09 23:02	6.222767
6900	Sushant KC	Mausam	2021-05-09 23:04	2.692250

26901 rows x 4 columns


```
[69]: top_50 = top_50.groupby(['track_name'], as_index=False).sum()
top_50 = top_50.sort_values(by='minutes_played', ascending=False).head(51)
top_50.reset_index(inplace = True, drop = True)
top_50
```

	track_name	minutes_played
0	Good Days	309.696083
1	Glock Six - Bonus	224.378750
2	Trisha & Ethan Do Oddly Satisfying Trends - Fr...	207.515317
3	Headaches	201.739267
4	Jake Paul, Wendy Williams, Bhad Bhabie & Dr. P...	197.453467
5	Solitaires (feat. Travis Scott)	184.761733
6	Darte Remix	169.738067
7	Satayeva	169.697950
8	Mausam	162.703183
9	Moving Naughtly (feat. Aitch & B Young)	160.472450
10	If Only	160.305100
11	Honey	159.56217
12	Okinawa	157.316367
13	From Time	154.523783
14	Tsunami	145.799017
15	CANT SAY	134.895917
16	Jealous (feat. Rico Nasty)	133.980817
17	Close	132.095217
18	Kiss Me More (feat. SZA)	128.362283
19	Protests and the Pandemic with Michele Norris	124.071317
20	Maya Ma	121.162083
21	Ordinary	120.384700
22	telepatia	119.742033
23	It's Time To Stop James Charles - H3 Podcast #...	117.598150
24	Sathi	116.471133
25	Stronger	115.705117
26	No Idea	114.342250
27	Baby	114.048150
28	Mystery Lady (feat. Don Toliver)	113.618517
29	Introspection	111.732733
30	GREECE (feat. Drake)	111.547367
31	STARGAZING	109.914200
32	This Universe	108.221267
33	B.S. (feat. H.E.R.)	106.539767
34	Trisha's Epic Passover Dinner At Ethan's - Freemias # 29	106.179450
35	Hold On	105.955567
36	Love Affair	103.029450
37	FLEX	102.919883
38	Nonstop	102.570817
39	Good Morning	102.247933
40	Life Is Good (feat. Drake)	102.246400
41	DOLLAZ ON MY HEAD (feat. Young Thug)	100.940067
42	Jumpman	100.531267
43	10k Hours (feat. Nas)	100.435500
44	Chicago Freestyle (feat. Gleeen)	98.867450
45	Dior	98.782850
46	The London (feat. J. Cole & Travis Scott)	98.347067
47	REVENGE	96.969550
48	Alter Party	96.376633
49	Luv'ing U	96.211000
50	Down to Earth	94.500717

```
In [70]: fig = px.scatter(top_50, x="track_name", y="minutes_played", title="Top 50 Songs")
fig.show()
```

Top 50 Songs



```
In [ ] :
```