Welcome to the Notebook

Let's mount the google drive

In [2]:

```
from google.colab import drive
drive.mount('/content/drive')
```

```
Drive already mounted at /content/drive; to attempt to forcibly remount, call
drive.mount("/content/drive", force_remount=True).
```

Task 1 :

Installing pyspark module

In [3]:

```
!pip install pyspark
```

```
Collecting pyspark
  Downloading https://files.pythonhosted.org/packages/8e/b0/bf9020b56492281b9
c9d8aae8f44ff51e1bc91b3ef5a884385cb4e389a40/pyspark-3.0.0.tar.gz (204.7MB)
     |████████████████████████████████| 204.7MB 63kB/s
Collecting py4j==0.10.9
  Downloading https://files.pythonhosted.org/packages/9e/b6/6a4fb90cd235dc8e2
65a6a2067f2a2c99f0d91787f06aca4bcf7c23f3f80/py4j-0.10.9-py2.py3-none-any.whl
(198kB)
     |████████████████████████████████| 204kB 2.7MB/s
Building wheels for collected packages: pyspark
  Building wheel for pyspark (setup.py) ... done
  Created wheel for pyspark: filename=pyspark-3.0.0-py2.py3-none-any.whl size
=205044182 sha256=fd95da363efe776efe96ce3e69715c473a6287feebdbcd2a3141e186a08
52c12
  Stored in directory: /root/.cache/pip/wheels/57/27/4d/ddacf7143f8d5b76c45c6
1ee2e43d9f8492fc5a8e78ebd7d37
Successfully built pyspark
Installing collected packages: py4j, pyspark
Successfully installed py4j-0.10.9 pyspark-3.0.0
```

Importing the modules

In [37]:

```
from pyspark.sql import SparkSession
from pyspark.sql.functions import count, desc , col, max , struct
import matplotlib.pyplot as plts
```

creating spark session

In [6]:

```
spark = SparkSession.builder.appName('Spark App').getOrCreate()
```

Task 2 :

importing the *Listenings.csv* file:

In [38]:

```
#loading the file
listening_csv_path = '/content/drive/My Drive/dataset/listenings.csv'
#inforSchema=True to infor for column headers; 'header',True for actually displaying the h
eader
listening_df = spark.read.format('csv').option('inforSchema', True).option('header', True)
.load(listening_csv_path)
```

let's check the data:

In [ ]:

```
listening_df.show()
```

let's delete useless columns:

In [15]:

```
listening_df = listening_df.drop('date')
```

drop the null rows:

In [16]:

```
listening_df = listening_df.na.drop()
```

let's check the dataset again:

In [ ]:

```
listening_df.show()
```

let's see the schema:

In [ ]:

```
listening_df.printSchema()
```

let's see the shape of our dataframe:

In [ ]:

```
shape = (listening_df.count(), len(listening_df.columns))
#.count() -> row count, .columns -> all columns
```

Task 3:

Query #0: select two columns: track and artist

In [ ]:

```
q0 = listening_df.select('artist', 'track')
q0.show()
```

Query #1:

Let's find all of the records of those users who have listened to ***Rihanna***

In [ ]:

```
q1 = listening_df.select('*').filter(listening_df.artist=='Rihanna')
q1.show()
```

Query #2:

Let's find top 10 users who are fan of ***Rihanna***

In [ ]:

```
q2 = listening_df.select('user_id').filter(listening_df.artist=='Rihanna')
#q2 now has the number of times each userid listen to Rihanna
q2 = q2.groupby('user_id').agg(count('user_id').alias('count'))
#order descending
q2 = q2.orderBy(desc('count'))
#only first ten from the order
q2 = q2.limit(10)
q2.show()
```

Query #3:

find top 10 famous tracks

In [ ]:

```
q3 = listening_df.select('artist', 'track').groupby('artist', 'track').agg(count('*').alias('count'))
q3 = q3.orderBy(desc('count')).limit(10)
q3.show()
```

Query #4:

find top 10 famous tracks of ***Rihanna***

In [ ]:

```
q4 = listening_df.select('artist', 'track').filter(listening_df.artist == 'Rihanna').groupby('artist', 'track').agg(count('*').alias('count').orderBy(desc('count')))
q4.show()
```

Query #5:

find top 10 famous albums

In [ ]:

```
q4 = listening_df.select('artist', 'album').groupby('artist', 'album').agg(count('*').alias('count').orderBy(desc('count')))
q4.show()
```

Task 4 :

importing the ***genre.csv*** file:

In [28]:

```
genre_csv_path = '/content/drive/My Drive/dataset/genre.csv'
genre_df = spark.read.format('csv').option('inforSchema', True).option('header', True).load(genre_csv_path)
```

let's check the data

In [29]:

```
genre_df.show()
```

```
+--------------------+-----+
|              artist|genre|
+--------------------+-----+
|                Muse| rock|
|             Nirvana| rock|
|            Bon Jovi| rock|
|          The Police| rock|
|                Kiss| rock|
|       Guns N' Roses| rock|
|         Rusted Root| rock|
|Katrina and the W...|  pop|
|         The Beatles| rock|
|         Hall & Oates|  pop|
|        Otis Redding| soul|
|         Marvin Gaye| soul|
|     The Cranberries| rock|
|            Survivor| rock|
|       Fleetwood Mac|blues|
|           Radiohead| rock|
|                Toto| rock|
|                  U2| rock|
|Creedence Clearwa...| rock|
|                 REM| rock|
+--------------------+-----+
only showing top 20 rows
```

Let's inner join these two data frames

In [31]:

```
data = listening_df.join(genre_df, how='inner', on=['artist'])
data.show()
```

```
+------------+-----------+--------------------+--------------------+---------
-----------+
|      artist|    user_id|               track|               album|
genre|
+------------+-----------+--------------------+--------------------+---------
-----------+
|    Jessie J|000Silenced|           Price Tag|         Who You Are| Ariana G
rande & ...|
|    Jessie J|000Silenced|           Price Tag|         Who You Are| Jhene Ai
ko & Rixton|
|    Jessie J|000Silenced|           Price Tag|         Who You Are| Nicki Mi
naj & Ar...|
|    Jessie J|000Silenced|           Price Tag|         Who You Are|
pop|
|    Jessie J|000Silenced|Price Tag (Acoust...|           Price Tag| Ariana G
rande & ...|
|    Jessie J|000Silenced|Price Tag (Acoust...|           Price Tag| Jhene Ai
ko & Rixton|
|    Jessie J|000Silenced|Price Tag (Acoust...|           Price Tag| Nicki Mi
naj & Ar...|
|    Jessie J|000Silenced|Price Tag (Acoust...|           Price Tag|
pop|
|       Robyn|000Silenced|Be Mine! (Ballad ...|            Be Mine!|
pop|
|       Kelis|000Silenced|            Acapella|            Acapella|
pop|
|   The Tease|000Silenced|   I'm Not Invisible|   I'm Not Invisible|
hip hop|
|    MSTRKRFT|000Silenced|Bounce (Feat NORE...|         Fist of God|
electronic|
|     Rihanna|000Silenced|Don't Stop The Mu...|Addicted 2 Bassli...|
SZA|
|     Rihanna|000Silenced|Don't Stop The Mu...|Addicted 2 Bassli...| Paul McC
artney &...|
|     Rihanna|000Silenced|Don't Stop The Mu...|Addicted 2 Bassli...|
Kanye West|
|     Rihanna|000Silenced|Don't Stop The Mu...|Addicted 2 Bassli...| Kanye We
st & Pau...|
|     Rihanna|000Silenced|Don't Stop The Mu...|Addicted 2 Bassli...|
pop|
|   Meshuggah|000Silenced|               ObZen|               ObZen|
metal|
|      Gojira|000Silenced|   Yama's Messengers|The Way of All Flesh|
metal|
|Napalm Death|000Silenced|On the Brink of E...|Time Waits For No...|
grindcore|
+------------+-----------+--------------------+--------------------+---------
-----------+
only showing top 20 rows
```

Query #6

find top 10 users who are fan of ***pop*** music

In [34]:

```
q6 = data.select('user_id').filter(data.genre == 'pop').groupby('user_id').agg(count('*').
alias('count')).orderBy(desc('count')).limit(10)
q6.show()
```

```
+---------------+-----+
|        user_id|count|
+---------------+-----+
|        01Green|  496|
|      momousagi|  400|
|          mrpsb|  400|
|   BlueKnockOut|  378|
|     musicboy80s|  376|
|   incultojurgis|  374|
| ElektricOrchid|  370|
|foreign_fanatic|  350|
|    Kevin_Soutar|  346|
|  landrover2171|  301|
+---------------+-----+
```

Query #7

find top 10 famous genres

In [35]:

```
q7 = data.select('genre').groupby('genre').agg(count('*').alias('count')).orderBy(desc('co
unt')).limit(10)
q7.show()
```

```
+----------+-------+
|     genre|  count|
+----------+-------+
|      rock|2691934|
|       pop|1544747|
|electronic| 551509|
|   hip hop| 532984|
|      folk| 438174|
|indie rock| 431439|
|      punk| 380915|
|       r&b| 344101|
|     metal| 208107|
|     indie| 206726|
+----------+-------+
```

Task 5:

Query #8

find out each user favourite genre

In [ ]:

```
q8_1 = data.select('user_id', 'genre').groupby('user_id','genre').agg(count('*').alias('count'))
q8_1.orderBy('user_id')
q8_1.show()
```

In [ ]:

```
#struct allows us to combine two or more columns together and find max count
q8_2 = q8_1.groupby('user_id').agg(max(struct(col('count'), col('genre'))).alias('max')).select(col('user_id'), col('max.genre'))
q8_2.show()
```

Query #9

find out how many pop,rock,metal and hip hop singers we have

and then visulize it using bar chart

In [44]:

```
#filter from many genres
q9 = genre_df.select('genre').filter( (col('genre') == 'pop') | (col('genre') == 'rock') | (col('genre') == 'metal') | (col('genre') == 'hip hop') ).groupby('genre').agg(count('genre').alias('Count'))
q9.show()
```

```
+-------+-----+
|  genre|Count|
+-------+-----+
|    pop| 6960|
|hip hop| 4288|
|  metal| 1854|
|   rock| 9066|
+-------+-----+
```

Now, let's visualize the results using ***matplotlib***

In [46]:

```
q9_list = q9.collect()
```

In [48]:

```
labels = [row['genre'] for row in q9_list]
counts = [row['Count'] for row in q9_list]

print(labels, counts)
```

```
['pop', 'hip hop', 'metal', 'rock'] [6960, 4288, 1854, 9066]
```

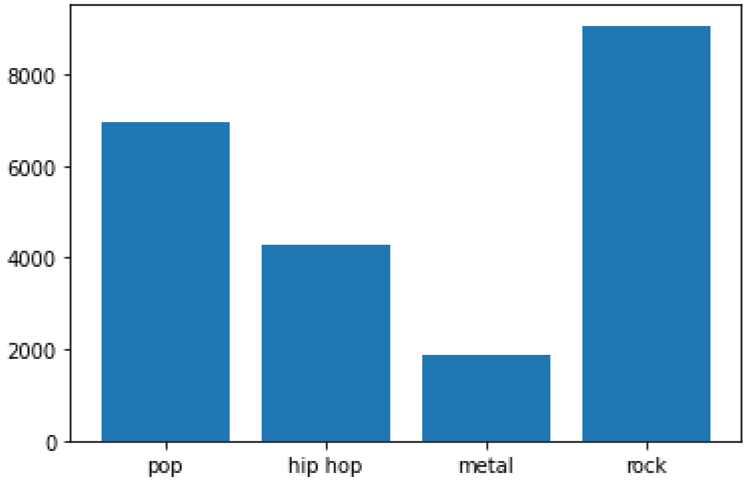
now lets visualize these two lists using a bar chart

In [49]:

```
plts.bar(labels, counts)
```

Out[49]:

```
<BarContainer object of 4 artists>
```


pop
hip hop
metal
rock