

▼ Advanced Pandas

We have learned basic operations with Series and DataFrame. Here are some advanced handy skills you must know as a data scientist.

▼ Setup the environment

```
import numpy as np
import pandas as pd
```

▼ Load the data

```
df = pd.read_csv("/content/Spotify_Youtube.csv", skiprows = 2, index_col= 0)
```

```
df.head()
```

| | Artist | Url_spotify | Track | Album | Album_type |
|---|----------|---|---|---|------------|
| 0 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | Feel Good Inc. | Demon Days | album |
| 1 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | Rhinestone Eyes | Plastic Beach | album |
| 2 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | New Gold (feat. Tame Impala and Bootie Brown) | New Gold (feat. Tame Impala and Bootie Brown) | single |
| 3 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | On Melancholy Hill | Plastic Beach | album |
| 4 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | Clint Eastwood | Gorillaz | album |

5 rows × 27 columns

```
df.head(10)
```

| | Artist | Url_spotify | Track | Album | Album_ |
|---|----------|---|----------------|------------|--------|
| 0 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | Feel Good Inc. | Demon Days | e |

| | | | | | |
|---|----------|---|---|---|---|
| 1 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | Rhinestone Eyes | Plastic Beach | € |
| 2 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | New Gold (feat. Tame Impala and Bootie Brown) | New Gold (feat. Tame Impala and Bootie Brown) | € |
| 3 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | On Melancholy Hill | Plastic Beach | € |
| 4 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | Clint Eastwood | Gorillaz | € |
| 5 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | DARE | Demon Days | € |
| 6 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | New Gold (feat. Tame Impala and Bootie Brown) ... | New Gold (feat. Tame Impala and Bootie Brown) ... | € |
| 7 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | She's My Collar (feat. Kali Uchis) | Humanz (Deluxe) | € |
| 8 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | Cracker Island (feat. Thundercat) | Cracker Island (feat. Thundercat) | € |
| 9 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | Dirty Harry | Demon Days | € |

10 rows × 27 columns

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 20718 entries, 0 to 20717
Data columns (total 27 columns):
#   Column                Non-Null Count  Dtype
---  -
0   Artist                20718 non-null  object
1   Url_spotify           20718 non-null  object
2   Track                 20718 non-null  object
3   Album                 20718 non-null  object
4   Album_type            20718 non-null  object
5   Uri                   20718 non-null  object
6   Danceability          20716 non-null  float64
7   Energy                20716 non-null  float64
8   Key                   20716 non-null  float64
9   Loudness              20716 non-null  float64
10  Speechiness           20716 non-null  float64
11  Acousticness          20716 non-null  float64
12  Instrumentalness      20716 non-null  float64
13  Liveness              20716 non-null  float64
14  Valence               20716 non-null  float64
15  Tempo                 20716 non-null  float64
16  Duration_ms           20716 non-null  float64
17  Url_youtube           20248 non-null  object
18  Title                 20248 non-null  object
19  Channel               20248 non-null  object
20  Views                 20248 non-null  float64
21  Likes                 20177 non-null  float64
22  Comments              20149 non-null  float64
23  Description            19842 non-null  object
24  Licensed               20248 non-null  object
25  official_video        20248 non-null  object
26  Stream                20142 non-null  float64
dtypes: float64(15), object(12)
memory usage: 4.4+ MB
```

```
df.shape
```

```
(20718, 27)
```

▼ Make a Sample

```
df_head = df.loc[:4]
df_head
```

| | Unnamed: 0 | Artist | Url_spotify | Track | Album |
|---|------------|----------|---|---|---|
| 0 | 0 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | Feel Good Inc. | Demon Days |
| 1 | 1 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | Rhinestone Eyes | Plastic Beach |
| 2 | 2 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | New Gold (feat. Tame Impala and Bootie Brown) | New Gold (feat. Tame Impala and Bootie Brown) |
| 3 | 3 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | On Melancholy Hill | Plastic Beach |
| 4 | 4 | Gorillaz | https://open.spotify.com/artist/3AA28KZvwAUcZu... | Clint Eastwood | Gorillaz |

5 rows x 28 columns

```
df_tail = df.loc[20713:]  
df_tail
```

| | Artist | Url_spotify | Track | Album |
|-------|----------------|---|---|---|
| 20713 | SICK LEGEND | https://open.spotify.com/artist/3EYY5FwDkHEYLw... | JUST DANCE HARDSTYLE | JUST DANCE HARDSTYLE |
| 20714 | SICK LEGEND | https://open.spotify.com/artist/3EYY5FwDkHEYLw... | SET FIRE TO THE RAIN HARDSTYLE | SET FIRE TO THE RAIN HARDSTYLE |
| 20715 | SICK LEGEND | https://open.spotify.com/artist/3EYY5FwDkHEYLw... | OUTSIDE HARDSTYLE SPED UP | OUTSIDE HARDSTYLE SPED UP |
| 20716 | SICK LEGEND | https://open.spotify.com/artist/3EYY5FwDkHEYLw... | ONLY GIRL HARDSTYLE | ONLY GIRL HARDSTYLE |
| 20717 | SICK LEGEND | https://open.spotify.com/artist/3EYY5FwDkHEYLw... | MISS YOU HARDSTYLE | MISS YOU HARDSTYLE |

5 rows × 27 columns

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 20718 entries, 0 to 20717
Data columns (total 27 columns):
#   Column                Non-Null Count  Dtype
---  -
0   Artist                20718 non-null  object
1   Url_spotify           20718 non-null  object
2   Track                 20718 non-null  object
3   Album                 20718 non-null  object
4   Album_type            20718 non-null  object
5   Uri                   20718 non-null  object
6   Danceability          20716 non-null  float64
7   Energy                20716 non-null  float64
8   Key                   20716 non-null  float64
9   Loudness              20716 non-null  float64
10  Speechiness           20716 non-null  float64
11  Acousticness          20716 non-null  float64
12  Instrumentalness      20716 non-null  float64
13  Liveness              20716 non-null  float64
14  Valence               20716 non-null  float64
15  Tempo                 20716 non-null  float64
16  Duration_ms           20716 non-null  float64
17  Url_youtube           20248 non-null  object
18  Title                 20248 non-null  object
19  Channel               20248 non-null  object
20  Views                 20248 non-null  float64
21  Likes                 20177 non-null  float64
22  Comments              20149 non-null  float64
23  Description            19842 non-null  object
24  Licensed               20248 non-null  object
25  official_video        20248 non-null  object
26  Stream                20142 non-null  float64
dtypes: float64(15), object(12)
memory usage: 4.9+ MB
```

```
needed_cols = ['Artist', 'Track', 'Album', 'Album_type', 'Views', 'Likes', 'Comments']
sample = df.loc[:, needed_cols]
sample
```

| | Artist | Track | Album | Album_type | Views | Likes | Comments |
|-------|-------------|---|---|------------|-------------|-----------|----------|
| 0 | Gorillaz | Feel Good Inc. | Demon Days | album | 693555221.0 | 6220896.0 | 169907 |
| 1 | Gorillaz | Rhinestone Eyes | Plastic Beach | album | 72011645.0 | 1079128.0 | 31005 |
| 2 | Gorillaz | New Gold (feat. Tame Impala and Bootie Brown) | New Gold (feat. Tame Impala and Bootie Brown) | single | 8435055.0 | 282142.0 | 7399 |
| 3 | Gorillaz | On Melancholy Hill | Plastic Beach | album | 211754952.0 | 1788577.0 | 55229 |
| 4 | Gorillaz | Clint Eastwood | Gorillaz | album | 618480958.0 | 6197318.0 | 155930 |
| ... | ... | ... | ... | ... | ... | ... | ... |
| 20713 | SICK LEGEND | JUST DANCE HARDSTYLE | JUST DANCE HARDSTYLE | single | 71678.0 | 1113.0 | 0 |
| 20714 | SICK LEGEND | SET FIRE TO THE RAIN HARDSTYLE | SET FIRE TO THE RAIN HARDSTYLE | single | 164741.0 | 2019.0 | 0 |
| 20715 | SICK LEGEND | OUTSIDE HARDSTYLE SPED UP | OUTSIDE HARDSTYLE SPED UP | single | 35646.0 | 329.0 | 0 |
| 20716 | SICK LEGEND | ONLY GIRL HARDSTYLE | ONLY GIRL HARDSTYLE | single | 6533.0 | 88.0 | 0 |
| 20717 | SICK LEGEND | MISS YOU HARDSTYLE | MISS YOU HARDSTYLE | single | 158697.0 | 2484.0 | 0 |

20718 rows x 10 columns


```
df_subset = sample.loc[[i for i in range(5,10)],['Artist', 'Track', 'Album']]
df_subset
```

| | Artist | Track | Album |
|---|----------|---|---|
| 5 | Gorillaz | DARE | Demon Days |
| 6 | Gorillaz | New Gold (feat. Tame Impala and Bootie Brown) ... | New Gold (feat. Tame Impala and Bootie Brown) ... |
| 7 | Gorillaz | She's My Collar (feat. Kali Uchis) | Humanz (Deluxe) |
| 8 | Gorillaz | Cracker Island (feat. Thundercat) | Cracker Island (feat. Thundercat) |
| 9 | Gorillaz | Dirty Harry | Demon Days |

```
import random
```

```
df_subset = df.loc[random.sample(range(0, len(df)), 5),['Artist', 'Track', 'Album']]
df_subset
```

| | Artist | Track | Album |
|-------|--------------|----------------------|--|
| 10358 | MK | 17 | 17 |
| 8423 | Roxette | Fading Like A Flower | ROX RMX Vol. 1 (Remixes From The Roxette Vaults) |
| 2652 | Tech N9ne | The Beast | Everready |
| 11208 | Belanova | Niño | Gran Disco Mini Precio - Dulce Beat |
| 5724 | Elvis Crespo | Tu Sonrisa | Suavemente |

▼ Examine the Sample

```
df_subset = sample.loc[:200]
```

```
df_subset.describe()
```

| | Views | Likes | Comments | Stream |
|-------|--------------|--------------|--------------|--------------|
| count | 2.010000e+02 | 2.010000e+02 | 2.010000e+02 | 1.940000e+02 |
| mean | 4.392491e+08 | 2.743846e+06 | 9.497165e+04 | 5.312933e+08 |
| std | 5.689961e+08 | 3.553588e+06 | 1.541008e+05 | 4.225929e+08 |
| min | 5.240000e+02 | 1.800000e+01 | 1.000000e+00 | 2.790105e+06 |
| 25% | 3.982595e+07 | 4.350310e+05 | 1.262800e+04 | 2.109106e+08 |
| 50% | 2.408346e+08 | 1.348845e+06 | 3.767800e+04 | 3.907870e+08 |
| 75% | 6.230273e+08 | 3.670104e+06 | 1.135670e+05 | 8.392759e+08 |
| max | 3.463816e+09 | 2.442584e+07 | 1.283529e+06 | 2.110574e+09 |

▼ Unique

```
df_subset.isnull().sum()
```

```
Artist      0
Track       0
Album       0
Album_type  0
Views       0
Likes       0
Comments    0
Licensed    0
official_video 0
Stream      7
dtype: int64
```

```
df_subset['Artist'].unique()
```

```
array(['Gorillaz', 'Red Hot Chili Peppers', '50 Cent', 'Metallica',
      'Coldplay', 'Daft Punk', 'Linkin Park', 'Radiohead', 'AC/DC',
      'Black Eyed Peas', 'Michael Jackson', 'P!nk', 'Eminem',
      'Pharrell Williams', 'Khalid', 'Shakira', 'Machine Gun Kelly',
      'Nicky Jam', 'The Beatles', 'Pitbull', 'Sean Paul'], dtype=object)
```

```
df_subset['Artist'].nunique()
```

21

▼ Filtering

```
df_subset['Views']>500000000
```

```
0      True
1     False
2     False
3     False
4      True
```

...

```
196    True
197   False
198   False
199   False
200    True
```

```
Name: Views, Length: 201, dtype: bool
```

```
df_subset_populate = df_subset[df_subset['Views']>500000000]
df_subset_populate
```

| | Artist | Track | Album | Album_type | Views | Likes | Commer |
|-----|-----------------------|---|---|------------|--------------|------------|--------|
| 0 | Gorillaz | Feel Good Inc. | Demon Days | album | 6.935552e+08 | 6220896.0 | 16990 |
| 4 | Gorillaz | Clint Eastwood | Gorillaz | album | 6.184810e+08 | 6197318.0 | 15593 |
| 10 | Red Hot Chili Peppers | Californication | Californication (Deluxe Edition) | album | 1.018811e+09 | 4394471.0 | 12145 |
| 14 | Red Hot Chili Peppers | Otherside | Californication (Deluxe Edition) | album | 6.735287e+08 | 3140356.0 | 6009 |
| 20 | 50 Cent | In Da Club | Get Rich Or Die Tryin' | album | 1.682616e+09 | 10481678.0 | 29674 |
| ... | ... | ... | ... | ... | ... | ... | ... |
| 191 | Pitbull | Timber (feat. Ke\$ha) | Global Warming: Meltdown (Deluxe Version) | album | 1.405540e+09 | 5671596.0 | 15845 |
| 193 | Pitbull | Feel This Moment (feat. Christina Aguilera) | Global Warming: Meltdown (Deluxe Version) | album | 7.048752e+08 | 2999847.0 | 11320 |
| 194 | Pitbull | International Love (feat. Chris Brown) | Planet Pit (Deluxe Version) | album | 8.664807e+08 | 2961540.0 | 15396 |
| 196 | Pitbull | We Are One (Ole Ola) [The Official 2014 FIFA W... | Globalization | album | 8.947563e+08 | 4925915.0 | 26702 |
| 200 | Sean Paul | No Lie | Mad Love The Prequel | album | 1.120854e+09 | 7147862.0 | 10856 |

62 rows x 10 columns

```
df_subset_pop_like = df_subset[(df_subset['Views']>500000000) & (df_subset['Likes']>100000000)]
df_subset_pop_like
```

| | Artist | Track | Album | Album_type | Views | Likes | Comments |
|-----|-------------|--------------------------|-------------------------------|------------|--------------|------------|----------|
| 20 | 50 Cent | In Da Club | Get Rich Or Die Tryin' | album | 1.682616e+09 | 10481678.0 | 296745.0 |
| 43 | Coldplay | Something Just Like This | Memories...Do Not Open | album | 2.118019e+09 | 10282499.0 | 270444.0 |
| 47 | Coldplay | Hymn for the Weekend | A Head Full of Dreams | album | 1.828242e+09 | 13515772.0 | 377666.0 |
| 60 | Linkin Park | In the End | Hybrid Theory (Bonus Edition) | album | 1.487186e+09 | 10183387.0 | 409471.0 |
| 61 | Linkin Park | Numb | Meteora | album | 1.928734e+09 | 12341722.0 | 550921.0 |
| 121 | Eminem | Without Me | The Eminem Show | album | 1.590485e+09 | 11469490.0 | 341006.0 |
| | | Love The | | | | | |

▼ Aggregation

```
byArtist = df_subset.groupby('Artist')
byArtist.agg(['sum', 'min', 'max'])
byArtist
```

<pandas.core.groupby.generic.DataFrameGroupBy object at 0x7f7661e20970>

| | | | | | | | |
|-----|---------|------------------------------------|--------------------|-------|--------------|------------|----------|
| | | for Africa) [The Official... | World Cup Album | | | | |
| 157 | Shakira | Chantaje (feat. Maluma) | El Dorado | album | 2.805793e+09 | 10370533.0 | 404270.0 |

```
byArtist.mean()
```

| | Views | Likes | Comments | Stream |
|-----------------------|--------------|-----------|----------|--------------|
| Artist | | | | |
| 50 Cent | 4.560241e+08 | 2751438.0 | 67265.1 | 4.059566e+08 |
| AC/DC | 3.377766e+08 | 1780121.9 | 42885.8 | 5.941406e+08 |
| Black Eyed Peas | 4.907164e+08 | 3052450.9 | 103966.5 | 4.473772e+08 |
| Coldplay | 9.997278e+08 | 6315789.5 | 212437.0 | 1.177848e+09 |
| Daft Punk | 1.590667e+08 | 1178728.7 | 39682.2 | 3.429594e+08 |
| Eminem | 9.119324e+08 | 6551353.4 | 291905.4 | 9.748588e+08 |
| Gorillaz | 2.043943e+08 | 1956852.7 | 55151.3 | 3.193174e+08 |
| Khalid | 5.398246e+08 | 4688144.7 | 100126.5 | 1.138684e+09 |
| Linkin Park | 5.685070e+08 | 3618088.4 | 150554.3 | 6.362409e+08 |
| Machine Gun Kelly | 1.147409e+08 | 1103353.8 | 35961.6 | 2.968454e+08 |
| Metallica | 2.453462e+08 | 1184439.8 | 35668.3 | 1.172162e+08 |
| Michael Jackson | 5.204962e+08 | 3741943.2 | 158154.9 | 4.606043e+08 |
| Nicky Jam | 6.322031e+08 | 2490104.6 | 65298.9 | 3.455008e+08 |
| P!nk | 3.475986e+08 | 1687056.6 | 48077.8 | 3.881729e+08 |
| Pharrell Williams | 1.083112e+08 | 826824.5 | 22133.1 | 3.108738e+08 |
| Pitbull | 6.106003e+08 | 2712502.2 | 100909.9 | 4.974721e+08 |
| Radiohead | 1.161638e+08 | 779568.6 | 24659.6 | 2.898239e+08 |
| Red Hot Chili Peppers | 4.061566e+08 | 1842214.7 | 46304.0 | 6.796467e+08 |
| Sean Paul | 1.120854e+09 | 7147862.0 | 108564.0 | 8.517118e+08 |
| Shakira | 8.818140e+08 | 5596303.5 | 285711.6 | 4.295045e+08 |
| The Beatles | 6.542037e+07 | 579237.4 | 11220.0 | 4.509275e+08 |

byArtist.sum()

| | Views | Likes | Comments | Stream |
|-----------------------|--------------|------------|-----------|--------------|
| Artist | | | | |
| 50 Cent | 4.560241e+09 | 27514380.0 | 672651.0 | 4.059566e+09 |
| AC/DC | 3.377766e+09 | 17801219.0 | 428858.0 | 5.941406e+09 |
| Black Eyed Peas | 4.907164e+09 | 30524509.0 | 1039665.0 | 4.473772e+09 |
| Coldplay | 9.997278e+09 | 63157895.0 | 2124370.0 | 1.177848e+10 |
| Daft Punk | 1.590667e+09 | 11787287.0 | 396822.0 | 3.429594e+09 |
| Eminem | 9.119324e+09 | 65513534.0 | 2919054.0 | 9.748588e+09 |
| Gorillaz | 2.043943e+09 | 19568527.0 | 551513.0 | 3.193174e+09 |
| Khalid | 5.398246e+09 | 46881447.0 | 1001265.0 | 1.138684e+10 |
| Linkin Park | 5.685070e+09 | 36180884.0 | 1505543.0 | 6.362409e+09 |
| Machine Gun Kelly | 1.147409e+09 | 11033538.0 | 359616.0 | 2.968454e+09 |
| Metallica | 2.453462e+09 | 11844398.0 | 356683.0 | 3.516486e+08 |
| Michael Jackson | 5.204962e+09 | 37419432.0 | 1581549.0 | 4.606043e+09 |
| Nicky Jam | 6.322031e+09 | 24901046.0 | 652989.0 | 3.455008e+09 |
| P!nk | 3.475986e+09 | 16870566.0 | 480778.0 | 3.881729e+09 |
| Pharrell Williams | 1.083112e+09 | 8268245.0 | 221331.0 | 3.108738e+09 |
| Pitbull | 6.106003e+09 | 27125022.0 | 1009099.0 | 4.974721e+09 |
| Radiohead | 1.161638e+09 | 7795686.0 | 246596.0 | 2.898239e+09 |
| Red Hot Chili Peppers | 4.061566e+09 | 18422147.0 | 463040.0 | 6.796467e+09 |
| Sean Paul | 1.120854e+09 | 7147862.0 | 108564.0 | 8.517118e+08 |
| Shakira | 8.818140e+09 | 55963035.0 | 2857116.0 | 4.295045e+09 |
| The Beatles | 6.542037e+08 | 5792374.0 | 112200.0 | 4.509275e+09 |

```
byArtist.sum().sort_values(by = ['Views'], ascending=False)
```

| | Views | Likes | Comments | Stream |
|-----------------------|--------------|------------|-----------|--------------|
| Artist | | | | |
| Coldplay | 9.997278e+09 | 63157895.0 | 2124370.0 | 1.177848e+10 |
| Eminem | 9.119324e+09 | 65513534.0 | 2919054.0 | 9.748588e+09 |
| Shakira | 8.818140e+09 | 55963035.0 | 2857116.0 | 4.295045e+09 |
| Nicky Jam | 6.322031e+09 | 24901046.0 | 652989.0 | 3.455008e+09 |
| Pitbull | 6.106003e+09 | 27125022.0 | 1009099.0 | 4.974721e+09 |
| Linkin Park | 5.685070e+09 | 36180884.0 | 1505543.0 | 6.362409e+09 |
| Khalid | 5.398246e+09 | 46881447.0 | 1001265.0 | 1.138684e+10 |
| Michael Jackson | 5.204962e+09 | 37419432.0 | 1581549.0 | 4.606043e+09 |
| Black Eyed Peas | 4.907164e+09 | 30524509.0 | 1039665.0 | 4.473772e+09 |
| 50 Cent | 4.560241e+09 | 27514380.0 | 672651.0 | 4.059566e+09 |
| Red Hot Chili Peppers | 4.061566e+09 | 18422147.0 | 463040.0 | 6.796467e+09 |
| P!nk | 3.475986e+09 | 16870566.0 | 480778.0 | 3.881729e+09 |
| AC/DC | 3.377766e+09 | 17801219.0 | 428858.0 | 5.941406e+09 |
| Metallica | 2.453462e+09 | 11844398.0 | 356683.0 | 3.516486e+08 |
| Gorillaz | 2.043943e+09 | 19568527.0 | 551513.0 | 3.193174e+09 |
| Daft Punk | 1.590667e+09 | 11787287.0 | 396822.0 | 3.429594e+09 |
| Radiohead | 1.161638e+09 | 7795686.0 | 246596.0 | 2.898239e+09 |
| Machine Gun Kelly | 1.147409e+09 | 11033538.0 | 359616.0 | 2.968454e+09 |
| Sean Paul | 1.120854e+09 | 7147862.0 | 108564.0 | 8.517118e+08 |
| Pharrell Williams | 1.083112e+09 | 8268245.0 | 221331.0 | 3.108738e+09 |
| The Beatles | 6.542037e+08 | 5792374.0 | 112200.0 | 4.509275e+09 |


```
byArtist.describe()
```

| | Views | | | | | |
|-----------------------|-------|--------------|--------------|--------------|--------------|--------------|
| | count | mean | std | min | 25% | 50% |
| Artist | | | | | | |
| 50 Cent | 10.0 | 4.560241e+08 | 5.227736e+08 | 4.609600e+04 | 1.392385e+07 | 4.586445e+08 |
| AC/DC | 10.0 | 3.377766e+08 | 4.082933e+08 | 1.025270e+05 | 5.675150e+07 | 2.464734e+08 |
| Black Eyed Peas | 10.0 | 4.907164e+08 | 3.590674e+08 | 2.099141e+06 | 1.815708e+08 | 5.484957e+08 |
| Coldplay | 10.0 | 9.997278e+08 | 6.754970e+08 | 7.320102e+07 | 6.212806e+08 | 8.110569e+08 |
| Daft Punk | 10.0 | 1.590667e+08 | 2.017015e+08 | 2.398407e+07 | 3.231087e+07 | 5.784133e+07 |
| Eminem | 10.0 | 9.119324e+08 | 7.943893e+08 | 1.931315e+06 | 4.772718e+08 | 6.713445e+08 |
| Gorillaz | 10.0 | 2.043943e+08 | 2.554966e+08 | 4.519960e+05 | 1.244125e+07 | 1.133864e+08 |
| Khalid | 10.0 | 5.398246e+08 | 5.242604e+08 | 1.381628e+06 | 1.577620e+08 | 4.490604e+08 |
| Linkin Park | 10.0 | 5.685070e+08 | 6.285519e+08 | 4.443698e+07 | 1.763149e+08 | 3.638215e+08 |
| Machine Gun Kelly | 10.0 | 1.147409e+08 | 1.320757e+08 | 1.539121e+07 | 2.409185e+07 | 8.527783e+07 |
| Metallica | 10.0 | 2.453462e+08 | 3.930397e+08 | 5.240000e+02 | 1.639417e+07 | 4.820173e+07 |
| Michael Jackson | 10.0 | 5.204962e+08 | 4.141004e+08 | 5.456550e+05 | 3.122165e+08 | 3.927137e+08 |
| Nicky Jam | 10.0 | 6.322031e+08 | 7.830092e+08 | 1.627250e+05 | 3.395761e+07 | 2.184816e+08 |
| P!nk | 10.0 | 3.475986e+08 | 4.471071e+08 | 3.309247e+06 | 9.792594e+07 | 2.029845e+08 |
| Pharrell Williams | 10.0 | 1.083112e+08 | 2.037413e+08 | 2.672481e+06 | 1.365412e+07 | 3.121735e+07 |
| Pitbull | 10.0 | 6.106003e+08 | 4.295432e+08 | 5.221435e+07 | 3.019308e+08 | 5.092326e+08 |
| Radiohead | 10.0 | 1.161638e+08 | 2.331689e+08 | 8.029000e+04 | 1.291460e+07 | 2.086711e+07 |
| Red Hot Chili Peppers | 10.0 | 4.061566e+08 | 2.680712e+08 | 8.663793e+07 | 2.652336e+08 | 3.304322e+08 |
| Sean Paul | 1.0 | 1.120854e+09 | NaN | 1.120854e+09 | 1.120854e+09 | 1.120854e+09 |
| Shakira | 10.0 | 8.818140e+08 | 1.244696e+09 | 3.597650e+05 | 1.464594e+08 | 2.206005e+08 |
| The Beatles | 10.0 | 6.542037e+07 | 3.663983e+07 | 2.879945e+07 | 3.610388e+07 | 5.505856e+07 |

```
type(byArtist.describe())
```

```
pandas.core.frame.DataFrame
```

```
byArtist.describe().loc['Coldplay']
```

| | | |
|----------|-------|--------------|
| Views | count | 1.000000e+01 |
| | mean | 9.997278e+08 |
| | std | 6.754970e+08 |
| | min | 7.320102e+07 |
| | 25% | 6.212806e+08 |
| | 50% | 8.110569e+08 |
| | 75% | 1.520008e+09 |
| | max | 2.118019e+09 |
| Likes | count | 1.000000e+01 |
| | mean | 6.315790e+06 |
| | std | 3.867560e+06 |
| | min | 7.873430e+05 |
| | 25% | 3.898590e+06 |
| | 50% | 5.066860e+06 |
| | 75% | 8.774966e+06 |
| | max | 1.351577e+07 |
| Comments | count | 1.000000e+01 |
| | mean | 2.124370e+05 |
| | std | 1.441001e+05 |
| | min | 1.637000e+03 |
| | 25% | 1.154190e+05 |
| | 50% | 1.930735e+05 |
| | 75% | 3.248760e+05 |
| | max | 4.327260e+05 |
| Stream | count | 1.000000e+01 |
| | mean | 1.177848e+09 |
| | std | 4.234401e+08 |
| | min | 4.753530e+08 |
| | 25% | 9.509118e+08 |
| | 50% | 1.082413e+09 |
| | 75% | 1.430879e+09 |
| | max | 2.030826e+09 |

Name: Coldplay, dtype: float64

```
type(byArtist.describe().loc['Coldplay'])
```

```
pandas.core.series.Series
```

```
byArtist.describe().loc[['Coldplay', 'The Beatles', 'Michael Jackson'], ['Views', '1
```

| Artist | Views | | | | | | |
|-----------------|-------|-------------|--------------|------------|--------------|-------------|--------------|
| | count | mean | std | min | 25% | 50% | 75% |
| Coldplay | 10.0 | 999727788.4 | 6.754970e+08 | 73201019.0 | 6.212806e+08 | 811056938.5 | 1.520111e+09 |
| The Beatles | 10.0 | 65420371.7 | 3.663983e+07 | 28799448.0 | 3.610388e+07 | 55058563.5 | 8.840111e+07 |
| Michael Jackson | 10.0 | 520496199.1 | 4.141004e+08 | 545655.0 | 3.122165e+08 | 392713724.0 | 8.050111e+08 |

```
type(byArtist.describe().loc[['Coldplay', 'The Beatles', 'Michael Jackson'], ['View
```

pandas.core.frame.DataFrame

```
byArtistAlbum = df_subset.groupby(['Artist','Album'])
cube = byArtistAlbum.describe()
cube
```

| | | Views | | | | | |
|-------------|-------------------------------|-------|-------------|--------------|-------------|-------------|------|
| | | count | mean | std | min | 25% | 50% |
| Artist | Album | | | | | | |
| 50 Cent | Best Friend (Remix) | 1.0 | 291023.0 | NaN | 291023.0 | 291023.0 | 2 |
| | Curtain Call 2 | 1.0 | 5289821.0 | NaN | 5289821.0 | 5289821.0 | 52 |
| | Get Rich Or Die Tryin' | 5.0 | 639945163.8 | 6.243727e+08 | 46096.0 | 441155628.0 | 5032 |
| | The Massacre | 3.0 | 451644688.0 | 4.001368e+08 | 39825951.0 | 257979707.0 | 4761 |
| AC/DC | Back In Black | 4.0 | 404651908.5 | 3.433447e+08 | 172293392.0 | 232102113.5 | 2655 |
| ... | ... | ... | ... | ... | ... | ... | ... |
| The Beatles | Help! (Remastered) | 1.0 | 42856675.0 | NaN | 42856675.0 | 42856675.0 | 428 |
| | Let It Be (Remastered) | 1.0 | 131925109.0 | NaN | 131925109.0 | 131925109.0 | 1319 |
| | Please Please Me (Remastered) | 1.0 | 53228361.0 | NaN | 53228361.0 | 53228361.0 | 532 |
| | Rubber Soul (Remastered) | 1.0 | 63223118.0 | NaN | 63223118.0 | 63223118.0 | 632 |
| | The Beatles (Remastered) | 1.0 | 33852949.0 | NaN | 33852949.0 | 33852949.0 | 338 |

133 rows x 32 columns

cube.loc[['Coldplay', 'The Beatles', 'Michael Jackson'],['Views','Likes']]

| | | Views | | | | |
|-------------|---|-------|--------------|--------------|--------------|--------------|
| | | count | mean | std | min | 25% |
| Artist | Album | | | | | |
| Coldplay | A Head Full of Dreams | 1.0 | 1.828242e+09 | | NaN | 1.828242e+09 |
| | A Rush of Blood to the Head | 1.0 | 1.082588e+09 | | NaN | 1.082588e+09 |
| | Ghost Stories | 1.0 | 7.864046e+08 | | NaN | 7.864046e+08 |
| | Memories...Do Not Open | 1.0 | 2.118019e+09 | | NaN | 2.118019e+09 |
| | Music Of The Spheres | 1.0 | 2.546560e+08 | | NaN | 2.546560e+08 |
| | Mylo Xyloto | 1.0 | 1.665814e+09 | | NaN | 1.665814e+09 |
| | Parachutes | 2.0 | 4.528667e+08 | 5.369284e+08 | 7.320102e+07 | 2.630339e+08 |
| | Viva La Vida or Death and All His Friends | 1.0 | 7.895815e+08 | | NaN | 7.895815e+08 |
| | X&Y | 1.0 | 5.662392e+08 | | NaN | 5.662392e+08 |
| The Beatles | 1 (Remastered) | 2.0 | 4.284411e+07 | 1.986215e+07 | 2.879945e+07 | 3.582178e+07 |
| | Abbey Road (Remastered) | 3.0 | 8.114310e+07 | 4.384534e+07 | 3.160777e+07 | 6.422875e+07 |
| | Help! (Remastered) | 1.0 | 4.285668e+07 | | NaN | 4.285668e+07 |
| | Let It Be (Remastered) | 1.0 | 1.319251e+08 | | NaN | 1.319251e+08 |
| | Please Please Me (Remastered) | 1.0 | 5.322836e+07 | | NaN | 5.322836e+07 |
| | Rubber Soul (Remastered) | 1.0 | 6.322312e+07 | | NaN | 6.322312e+07 |
| | The Beatles (Remastered) | 1.0 | 3.385295e+07 | | NaN | 3.385295e+07 |

| | | | | | | |
|-----------------|---|-----|--------------|--------------|--------------|--------------|
| Michael Jackson | Bad (Remastered) | 2.0 | 2.604891e+08 | 2.486701e+08 | 8.465275e+07 | 1.725709e+08 |
| | Dangerous | 1.0 | 5.040573e+08 | NaN | 5.040573e+08 | 5.040573e+08 |
| | HIStory - PAST, PRESENT AND FUTURE - BOOK I | 1.0 | 9.786800e+08 | NaN | 9.786800e+08 | 9.786800e+08 |
| | Off the Wall | 2.0 | 3.254739e+08 | 3.341520e+07 | 3.018458e+08 | 3.136599e+08 |
| | Thriller | 2.0 | 1.103212e+09 | 2.793354e+08 | 9.056923e+08 | 1.004452e+09 |
| | XSCAPE | 2.0 | 1.719371e+08 | 2.423841e+08 | 5.456550e+05 | 8.624136e+07 |

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