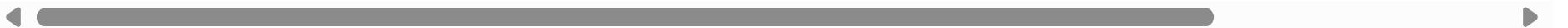


```
In [37]: ##Importing the necessary Packages
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

```
In [39]: ##Loading the dataset
spotify= pd.read_csv("data.csv")
spotify.head()
```

```
In [41]: ##Dataset Cleaning
spotify.drop("Unnamed: 0",axis=1,inplace=True)
spotify.head()
```

```
Out[41]:   acousticness  danceability  duration_ms  energy  instrumentalness  key  liveness  loudness  mode  speechiness  tempo  time_signature  valence
0          0.0102        0.833    204600  0.434      0.021900    2  0.1650   -8.795      1     0.4310  150.062           4.0
1          0.1990        0.743    326933  0.359      0.006110    1  0.1370  -10.401      1     0.0794  160.083           4.0
2          0.0344        0.838    185707  0.412      0.000234    2  0.1590   -7.148      1     0.2890  75.044           4.0
3          0.6040        0.494    199413  0.338      0.510000    5  0.0922  -15.236      1     0.0261  86.468           4.0
4          0.1800        0.678    392893  0.561      0.512000    5  0.4390  -11.648      0     0.0694  174.004           4.0
```



```
In [42]: ##Analysing the Dataset
spotify.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2017 entries, 0 to 2016
Data columns (total 16 columns):
 #   Column            Non-Null Count  Dtype  
--- 
 0   acousticness      2017 non-null   float64
 1   danceability      2017 non-null   float64
 2   duration_ms       2017 non-null   int64  
 3   energy             2017 non-null   float64
 4   instrumentalness  2017 non-null   float64
 5   key                2017 non-null   int64  
 6   liveness           2017 non-null   float64
 7   loudness           2017 non-null   float64
 8   mode               2017 non-null   int64  
 9   speechiness        2017 non-null   float64
 10  tempo              2017 non-null   float64
 11  time_signature     2017 non-null   float64
 12  valence            2017 non-null   float64
 13  target              2017 non-null   int64  
 14  song_title          2017 non-null   object  
 15  artist              2017 non-null   object  
dtypes: float64(10), int64(4), object(2)
memory usage: 252.3+ KB
```

```
In [43]: spotify.duplicated().unique()
```

```
Out[43]: array([False,  True])
```

```
In [44]: spotify.duplicated().value_counts()
```

```
Out[44]: False    2012
         True     5
        dtype: int64
```

```
In [45]: spotify.drop_duplicates(inplace=True)
```

```
In [46]: ##Calculating the number of rows and columns of the dataset
         spotify.shape
```

```
Out[46]: (2012, 16)
```

```
In [47]: spotify.describe()
```

Out[47]:

	acousticness	danceability	duration_ms	energy	instrumentalness	key	liveness	loudness	mode	speechiness
count	2012.000000	2012.000000	2.012000e+03	2012.000000	2012.000000	2012.000000	2012.000000	2012.000000	2012.000000	2012.0000
mean	0.187513	0.618450	2.462608e+05	0.681840	0.132980	5.348907	0.190816	-7.076750	0.612326	0.0925
std	0.259691	0.161003	8.202146e+04	0.210255	0.272967	3.649559	0.155571	3.756502	0.487341	0.0896
min	0.000003	0.122000	1.604200e+04	0.014800	0.000000	0.000000	0.018800	-33.097000	0.000000	0.0231
25%	0.009590	0.514000	2.000045e+05	0.563750	0.000000	2.000000	0.092200	-8.392250	0.000000	0.0375
50%	0.063500	0.631000	2.291200e+05	0.715500	0.000074	6.000000	0.126500	-6.247500	1.000000	0.0549
75%	0.265000	0.738000	2.703565e+05	0.846000	0.053925	9.000000	0.246250	-4.744000	1.000000	0.1080
max	0.995000	0.984000	1.004627e+06	0.998000	0.976000	11.000000	0.969000	-0.307000	1.000000	0.8160

In [49]: `spotify.head()`

Out[49]:

	acousticness	danceability	duration_ms	energy	instrumentalness	key	liveness	loudness	mode	speechiness	tempo	time_signature	valence
0	0.0102	0.833	204600	0.434	0.021900	2	0.1650	-8.795	1	0.4310	150.062		4.0
1	0.1990	0.743	326933	0.359	0.006110	1	0.1370	-10.401	1	0.0794	160.083		4.0
2	0.0344	0.838	185707	0.412	0.000234	2	0.1590	-7.148	1	0.2890	75.044		4.0
3	0.6040	0.494	199413	0.338	0.510000	5	0.0922	-15.236	1	0.0261	86.468		4.0
4	0.1800	0.678	392893	0.561	0.512000	5	0.4390	-11.648	0	0.0694	174.004		4.0

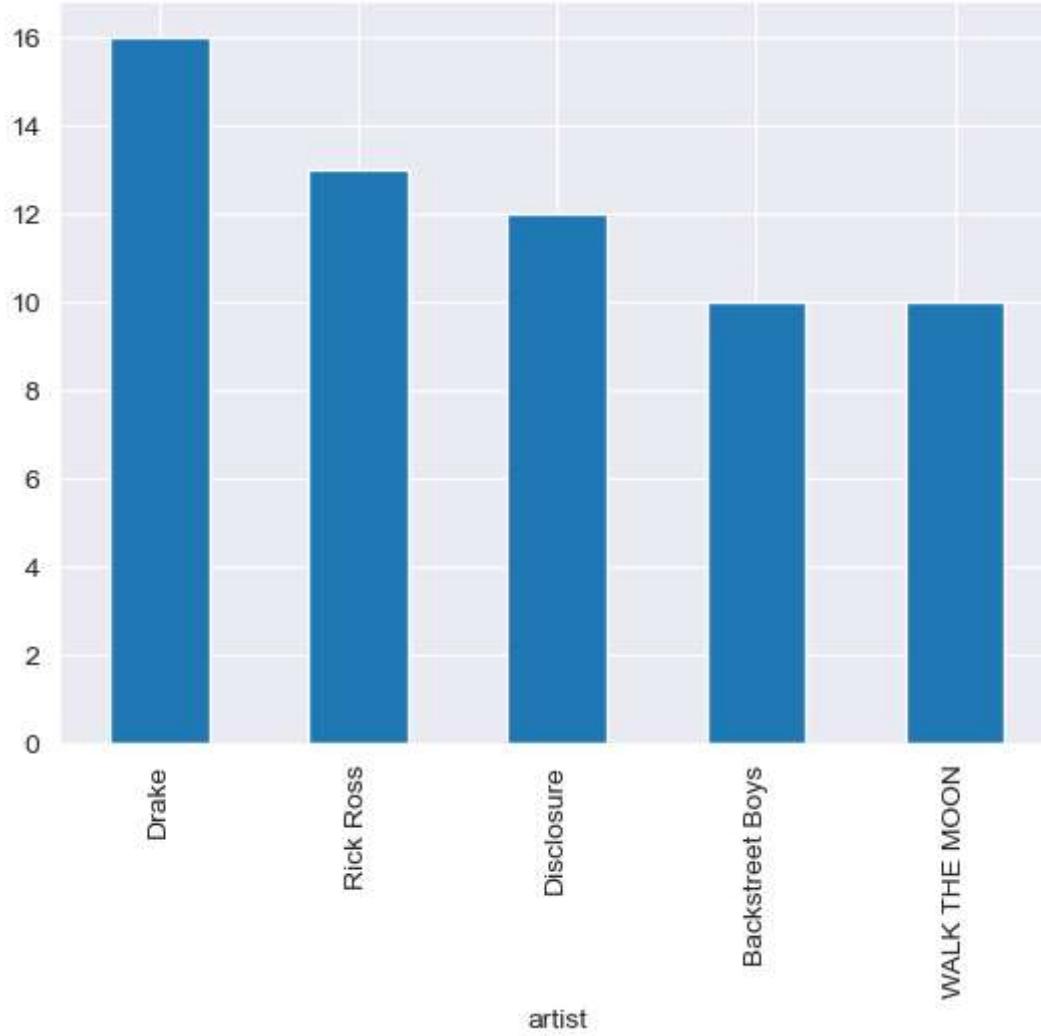
In [50]: `spotify.groupby("artist")["song_title"].count().sort_values(ascending=False)`

```
Out[50]: artist
Drake           16
Rick Ross       13
Disclosure      12
Backstreet Boys 10
WALK THE MOON   10
..
Hillsong Young & Free    1
Hillsong Worship      1
High School Musical Cast 1
Heems             1
플랫핏 Flat Feet        1
Name: song_title, Length: 1343, dtype: int64
```

```
In [51]: ##Visualization
#top 5 most popular artists
top_five_artist=spotify.groupby("artist").count().sort_values(by="song_title",ascending=False)[ "song_title"].head(5)
top_five_artist
```

```
Out[51]: artist
Drake           16
Rick Ross       13
Disclosure      12
Backstreet Boys 10
WALK THE MOON   10
Name: song_title, dtype: int64
```

```
In [52]: top_five_artist.plot.bar()
plt.show()
```



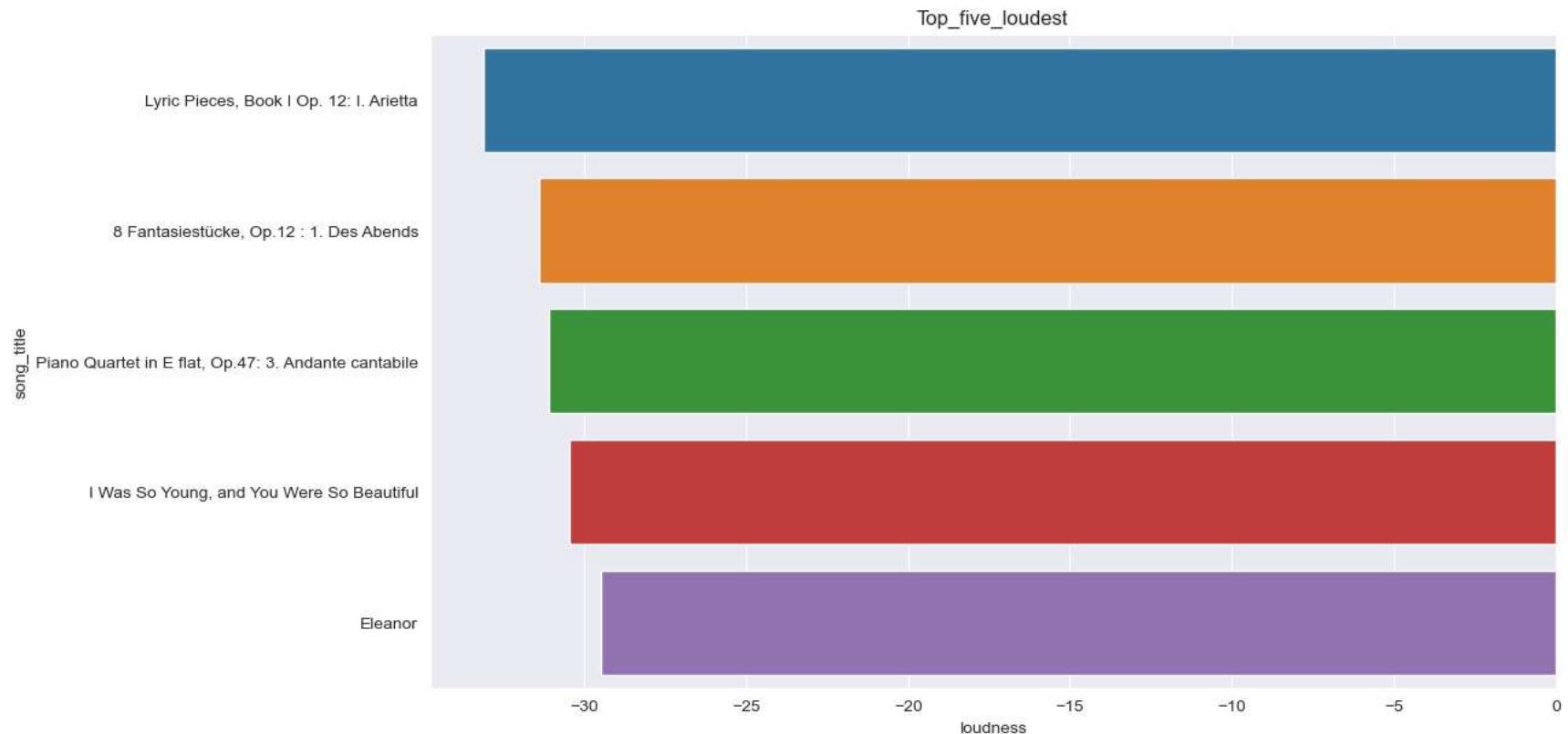
```
In [53]: #top 5 Loudest tracks
top_five_loudest=spotify[["loudness","song_title"]].sort_values(by="loudness",ascending=True)[:5]
top_five_loudest
```

Out[53]:

	loudness	song_title
1594	-33.097	Lyric Pieces, Book I Op. 12: I. Arietta
1596	-31.367	8 Fantasiestücke, Op.12 : 1. Des Abends
1598	-31.082	Piano Quartet in E flat, Op.47: 3. Andante can...
1531	-30.447	I Was So Young, and You Were So Beautiful
1549	-29.460	Eleanor

In [54]:

```
plt.figure(figsize=(12,7))
sns.barplot(x="loudness",y="song_title",data=top_five_loudest)
plt.title("Top_five_loudest")
plt.show()
```



In [55]:

```
#artist with the most danceability song
top_five_artist_danceability=spotify[["danceability","song_title","artist"]].sort_values(by="danceability",ascending=False)
```

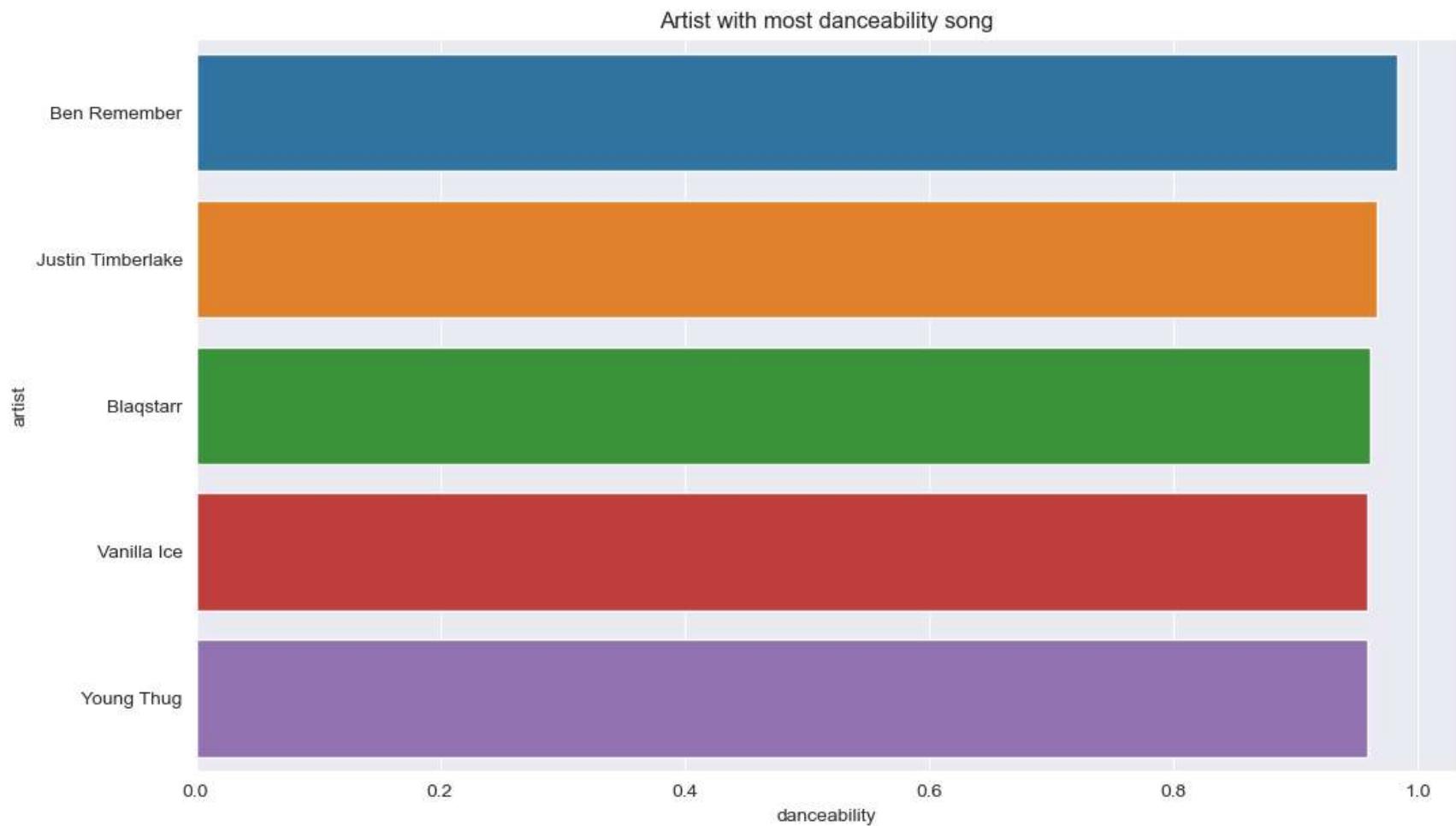
```
top_five_artist_danceability
```

Out[55]:

	danceability	song_title	artist
1433	0.984	Flashwind - Radio Edit	Ben Remember
1901	0.967	SexyBack	Justin Timberlake
604	0.962	Check Me Out Like	Blaqstarr
1957	0.959	Ice Ice Baby	Vanilla Ice
32	0.959	Best Friend	Young Thug

In [56]:

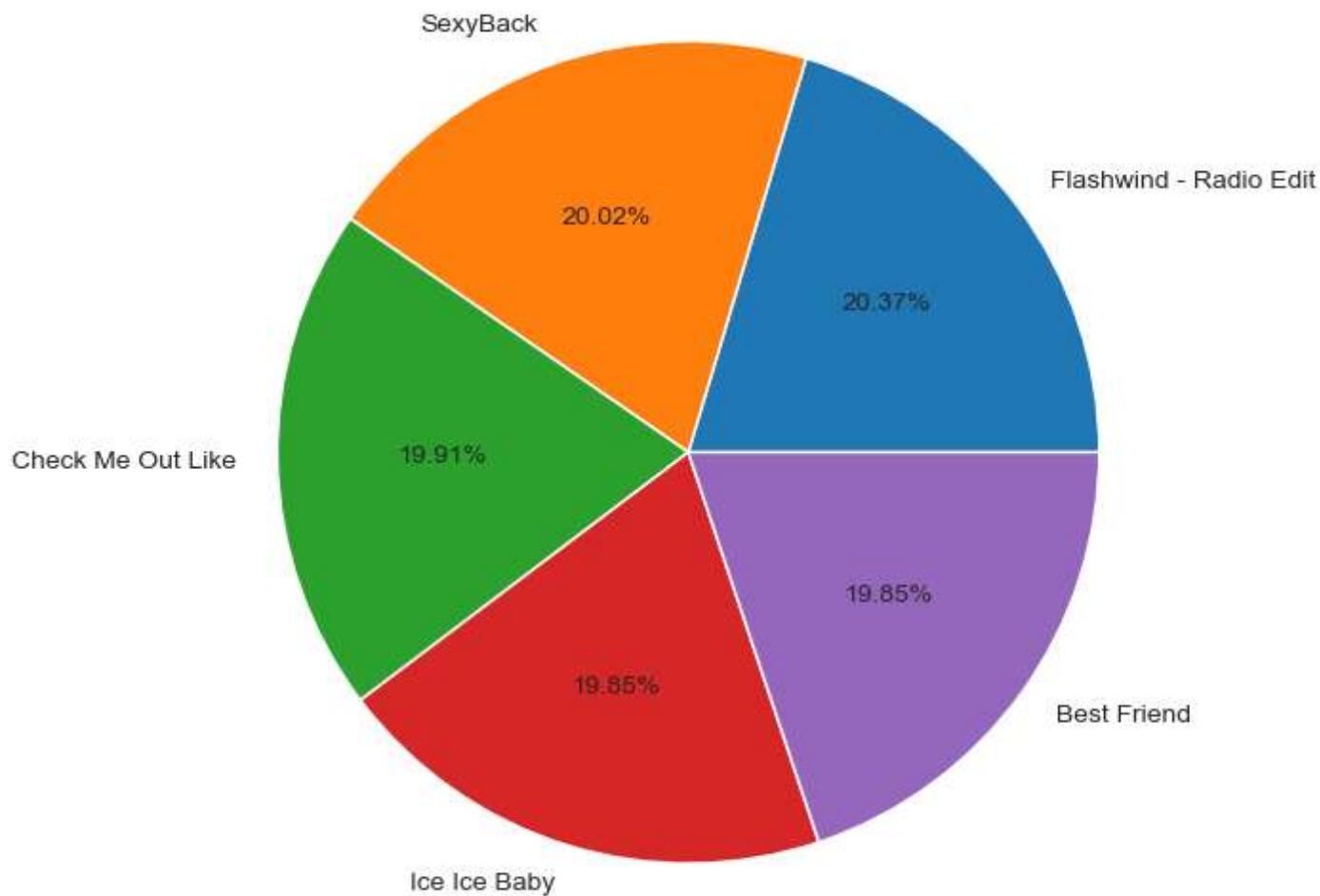
```
plt.figure(figsize=(12,7))
sns.barplot(x="danceability",y="artist",data=top_five_artist_danceability)
plt.title("Artist with most danceability song")
plt.show()
```



```
In [57]: spotify.columns
```

```
Out[57]: Index(['acousticness', 'danceability', 'duration_ms', 'energy',
       'instrumentalness', 'key', 'liveness', 'loudness', 'mode',
       'speechiness', 'tempo', 'time_signature', 'valence', 'target',
       'song_title', 'artist'],
      dtype='object')
```

```
In [75]: plt.figure(figsize=(12,7))
plt.pie(x="danceability",data=top_five_artist_danceability,autopct='%1.2f%%',labels=top_five_artist_danceability.song_tit
plt.show()
```



```
In [66]: #multiple feature plots
interest_feature_cols=["tempo","loudness","acousticness","danceability","duration_ms","energy","instrumentalness","livel
```

```
In [67]: for feature_col in interest_feature_cols:
    pos_data=spotify[spotify["target"]==1][feature_col]
    neg_data=spotify[spotify["target"]==0][feature_col]

    plt.figure(figsize=(12,7))
    sns.distplot(pos_data,bins=30,label="Positive",color="green")
```

```
sns.distplot(neg_data,bins=30,label="Negative",color="red")  
  
plt.legend(loc="upper right")  
plt.title(f"Positive and Negative Histogram Plot For {feature_col}")  
plt.show()
```

C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:6: UserWarning:

`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms).

For a guide to updating your code to use the new functions, please see
<https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751>

```
sns.distplot(pos_data,bins=30,label="Positive",color="green")
```

C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:7: UserWarning:

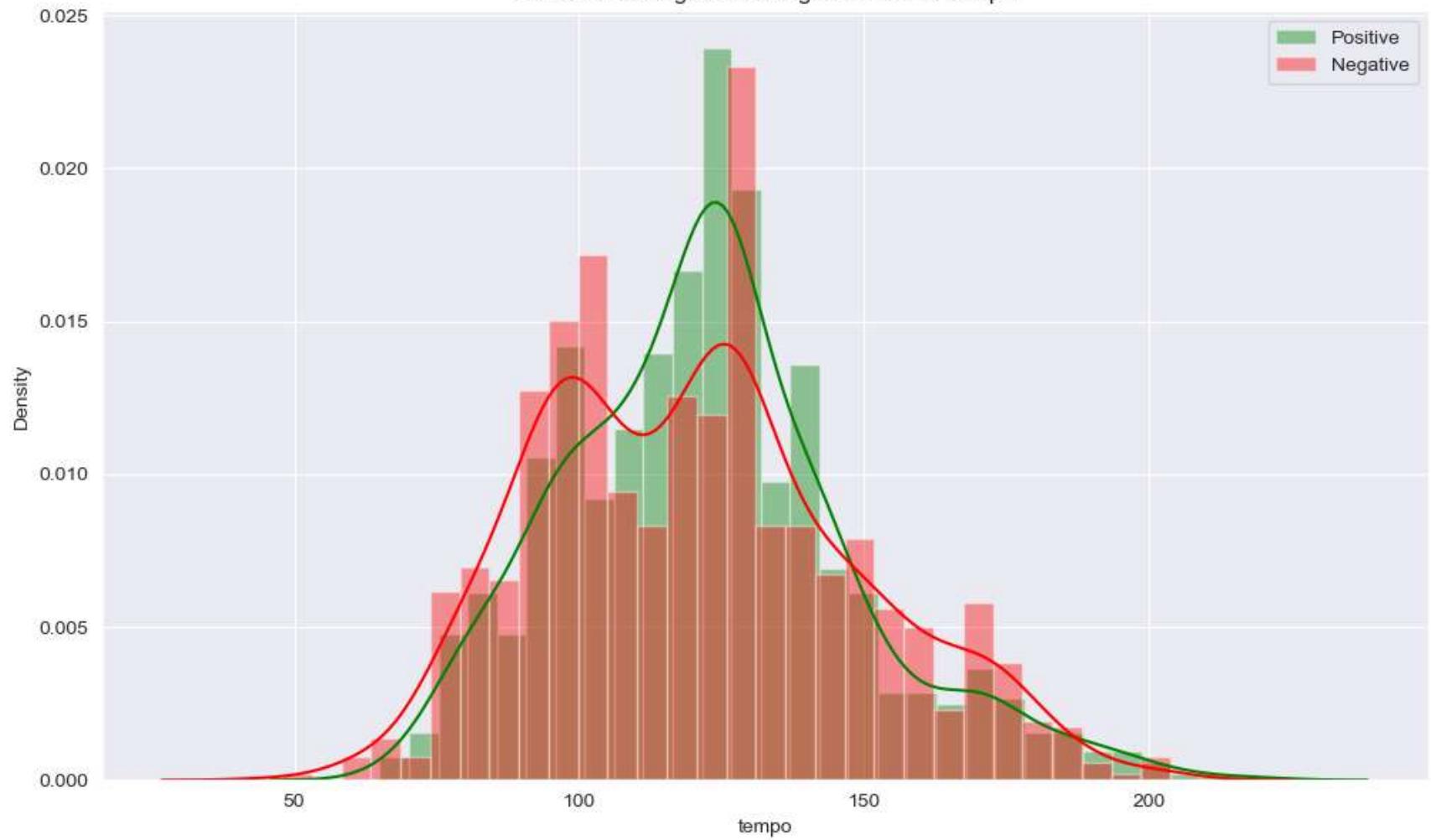
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

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<https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751>

```
sns.distplot(neg_data,bins=30,label="Negative",color="red")
```

Positive and Negative Histogram Plot For tempo



```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:6: UserWarning:
```

```
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.
```

```
Please adapt your code to use either `displot` (a figure-level function with  
similar flexibility) or `histplot` (an axes-level function for histograms).
```

```
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https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751
```

```
    sns.distplot(pos_data,bins=30,label="Positive",color="green")
```

```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:7: UserWarning:
```

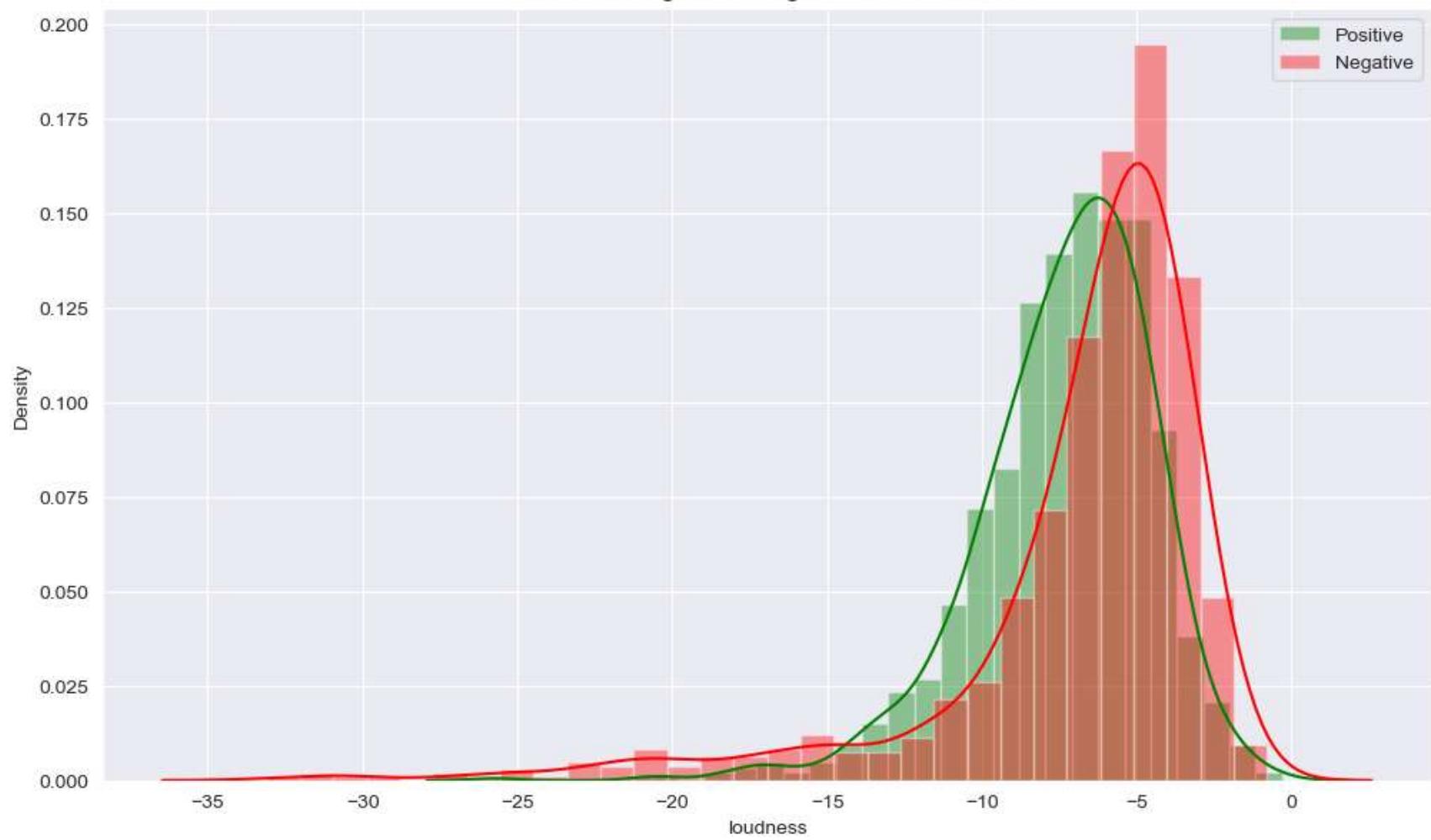
```
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```

```
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```

```
For a guide to updating your code to use the new functions, please see  
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751
```

```
    sns.distplot(neg_data,bins=30,label="Negative",color="red")
```

Positive and Negative Histogram Plot For loudness



```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:6: UserWarning:
```

```
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.
```

```
Please adapt your code to use either `displot` (a figure-level function with  
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```

```
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https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751
```

```
    sns.distplot(pos_data,bins=30,label="Positive",color="green")
```

```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:7: UserWarning:
```

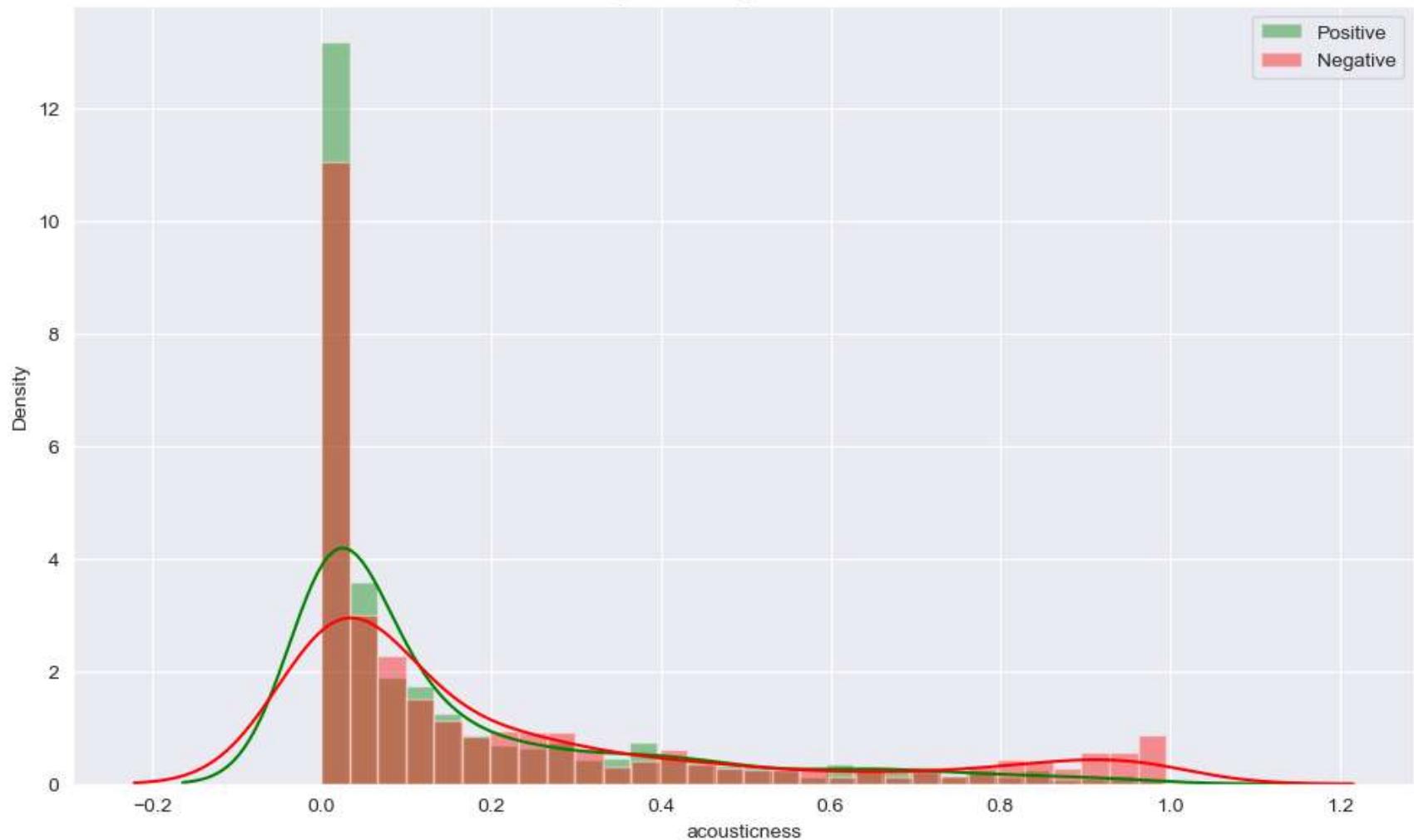
```
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.
```

```
Please adapt your code to use either `displot` (a figure-level function with  
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```

```
For a guide to updating your code to use the new functions, please see  
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751
```

```
    sns.distplot(neg_data,bins=30,label="Negative",color="red")
```

Positive and Negative Histogram Plot For acousticness



```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:6: UserWarning:
```

```
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.
```

```
Please adapt your code to use either `displot` (a figure-level function with  
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```
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```

```
    sns.distplot(pos_data,bins=30,label="Positive",color="green")
```

```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:7: UserWarning:
```

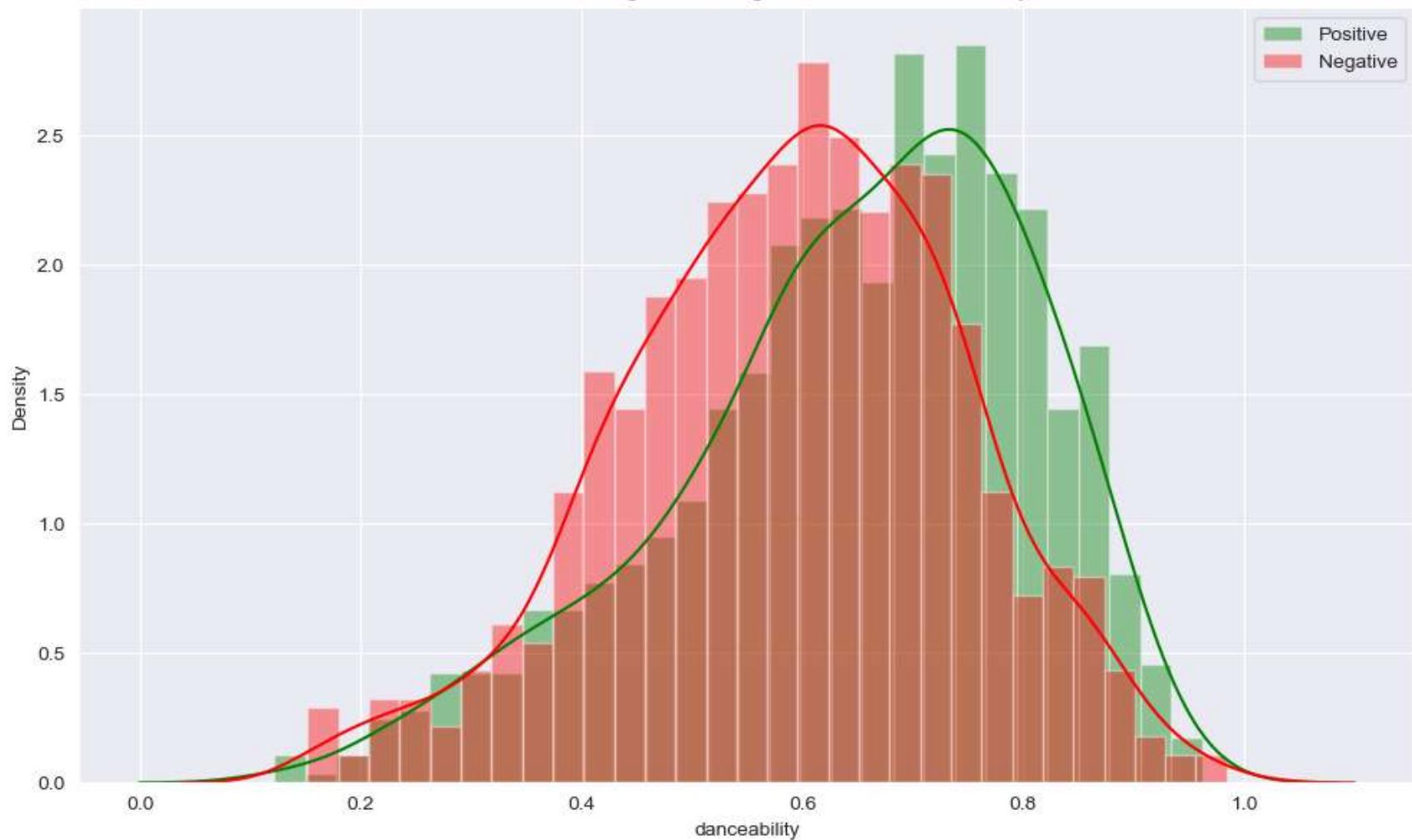
```
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```
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```

```
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```

```
    sns.distplot(neg_data,bins=30,label="Negative",color="red")
```

Positive and Negative Histogram Plot For danceability



```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:6: UserWarning:
```

```
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.
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```

```
    sns.distplot(pos_data,bins=30,label="Positive",color="green")
```

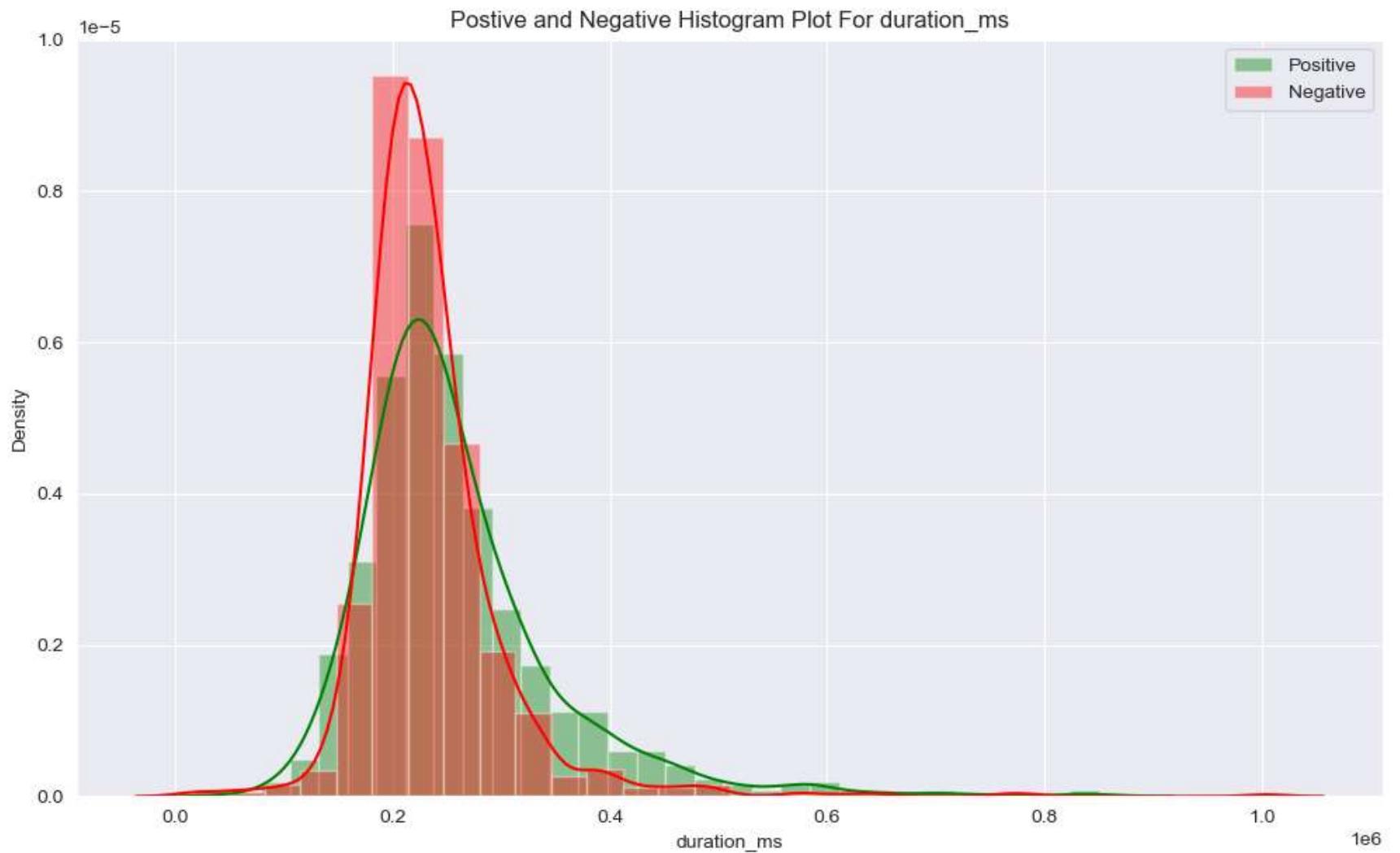
```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:7: UserWarning:
```

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```

```
    sns.distplot(neg_data,bins=30,label="Negative",color="red")
```



```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:6: UserWarning:
```

```
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```
    sns.distplot(pos_data,bins=30,label="Positive",color="green")
```

```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:7: UserWarning:
```

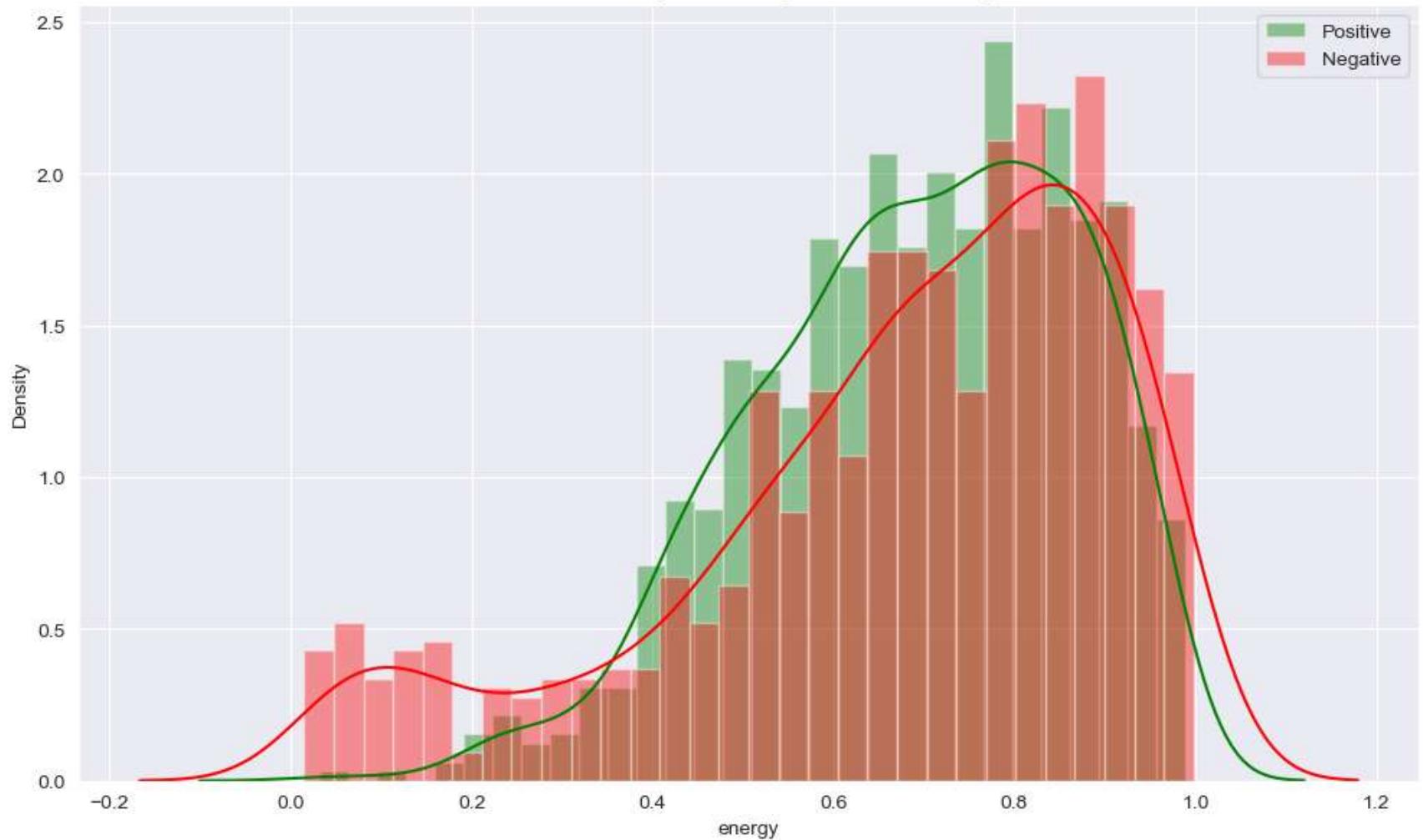
```
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.
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```

```
For a guide to updating your code to use the new functions, please see  
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751
```

```
    sns.distplot(neg_data,bins=30,label="Negative",color="red")
```

Positive and Negative Histogram Plot For energy



```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:6: UserWarning:
```

```
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.
```

```
Please adapt your code to use either `displot` (a figure-level function with  
similar flexibility) or `histplot` (an axes-level function for histograms).
```

```
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```

```
    sns.distplot(pos_data,bins=30,label="Positive",color="green")
```

```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:7: UserWarning:
```

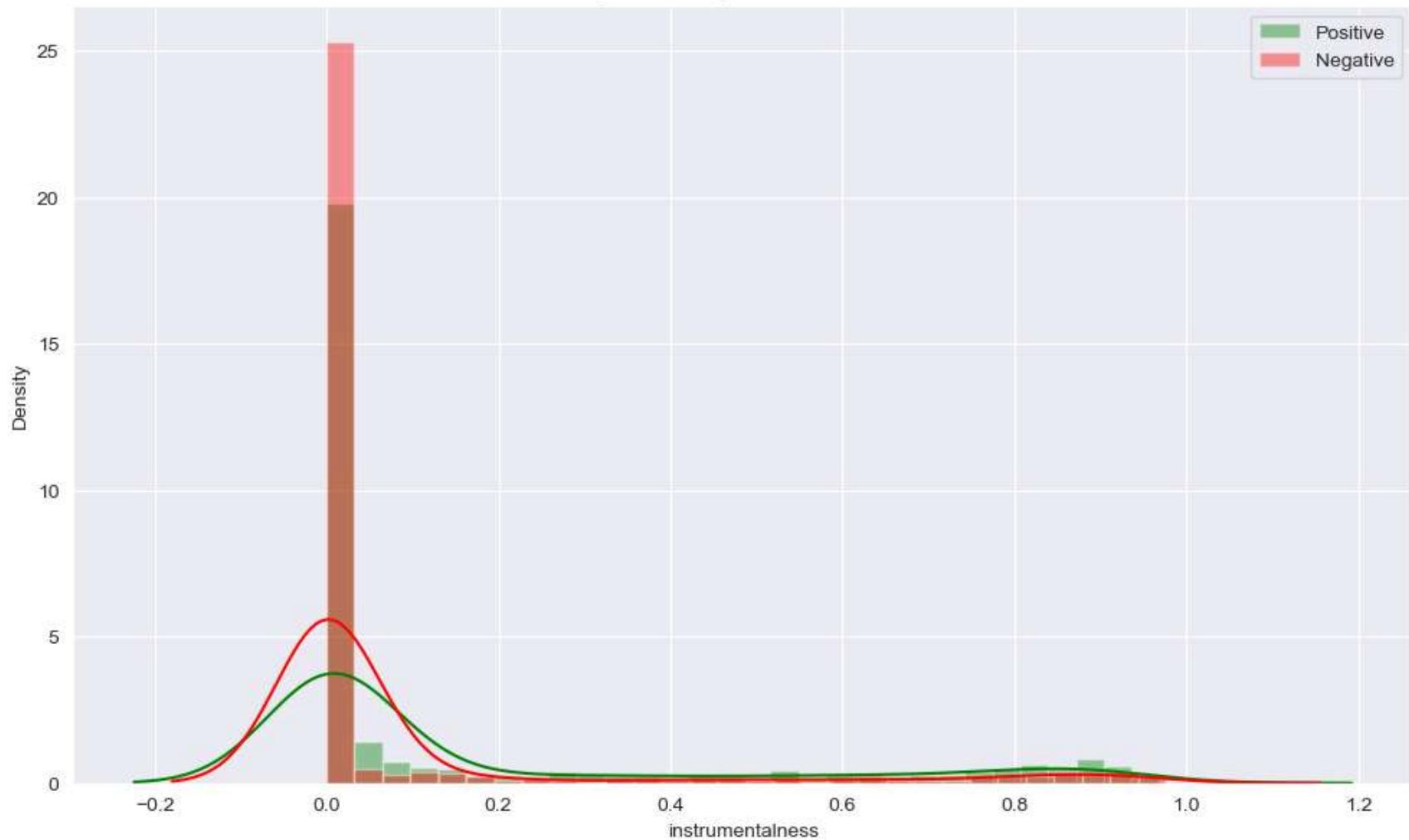
```
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.
```

```
Please adapt your code to use either `displot` (a figure-level function with  
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```

```
For a guide to updating your code to use the new functions, please see  
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751
```

```
    sns.distplot(neg_data,bins=30,label="Negative",color="red")
```

Positive and Negative Histogram Plot For instrumentalness



```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:6: UserWarning:
```

```
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.
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```

```
    sns.distplot(pos_data,bins=30,label="Positive",color="green")
```

```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:7: UserWarning:
```

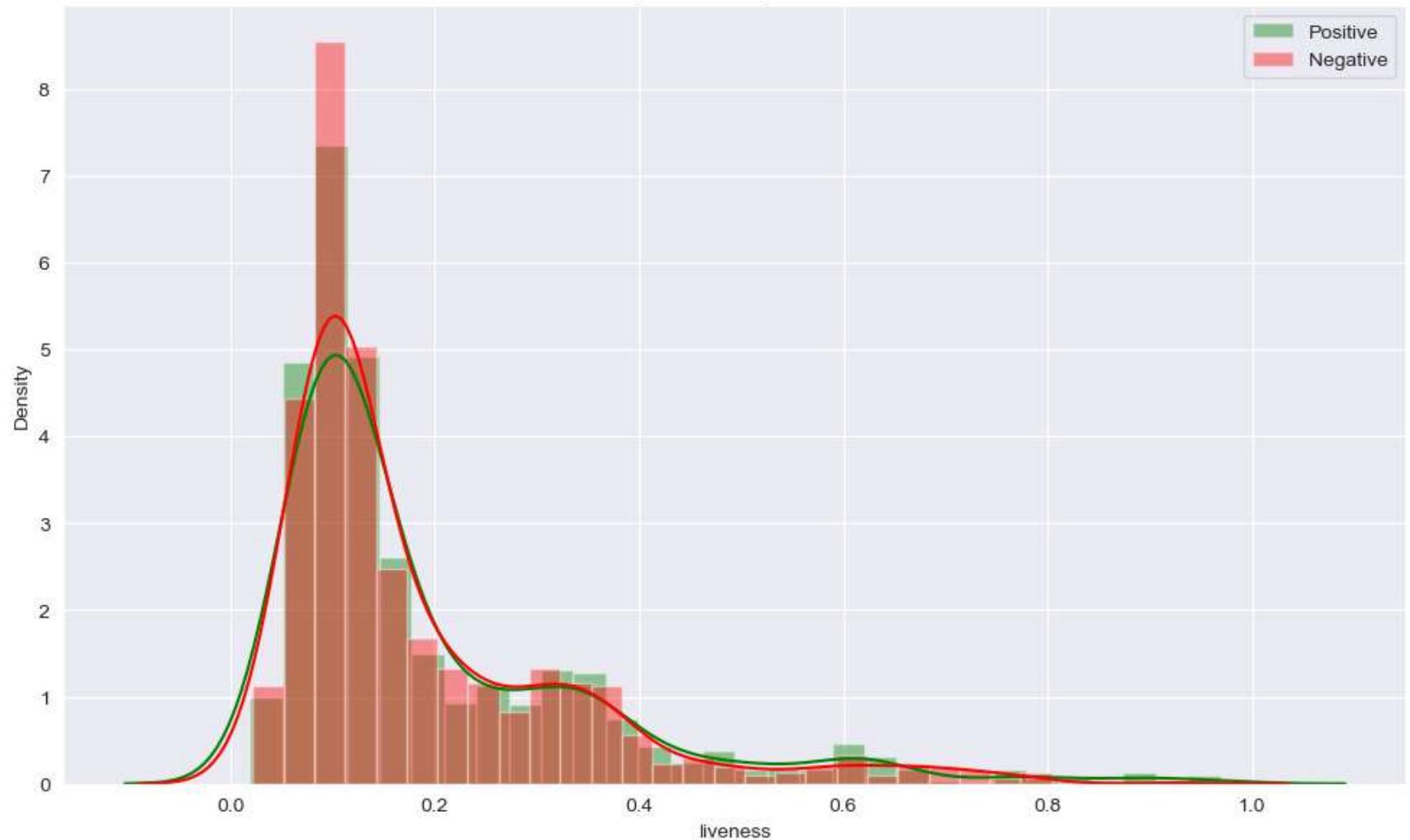
```
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.
```

```
Please adapt your code to use either `displot` (a figure-level function with  
similar flexibility) or `histplot` (an axes-level function for histograms).
```

```
For a guide to updating your code to use the new functions, please see  
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751
```

```
    sns.distplot(neg_data,bins=30,label="Negative",color="red")
```

Positive and Negative Histogram Plot For liveness



```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:6: UserWarning:
```

```
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.
```

```
Please adapt your code to use either `displot` (a figure-level function with  
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```

```
For a guide to updating your code to use the new functions, please see  
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751
```

```
    sns.distplot(pos_data,bins=30,label="Positive",color="green")
```

```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:7: UserWarning:
```

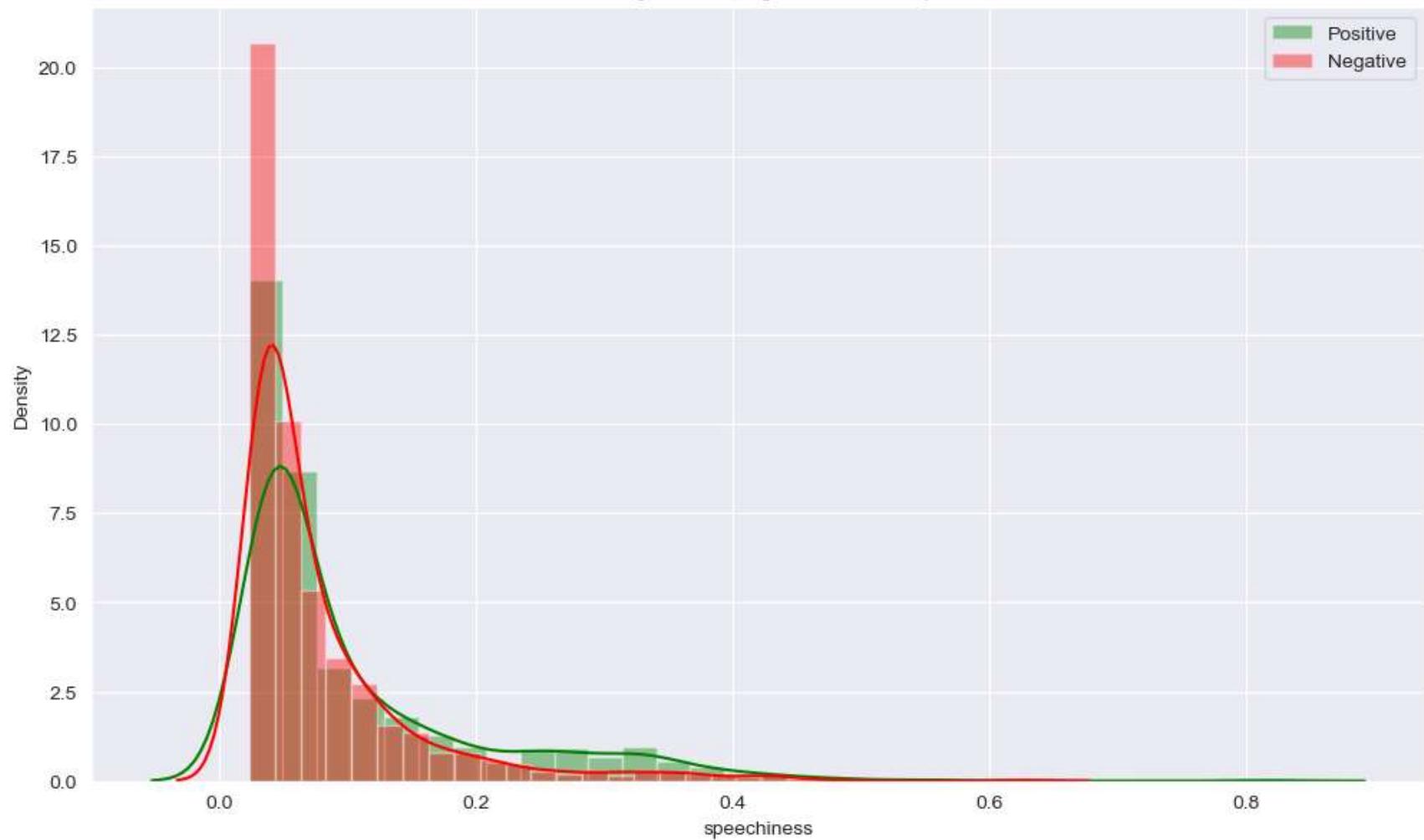
```
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.
```

```
Please adapt your code to use either `displot` (a figure-level function with  
similar flexibility) or `histplot` (an axes-level function for histograms).
```

```
For a guide to updating your code to use the new functions, please see  
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751
```

```
    sns.distplot(neg_data,bins=30,label="Negative",color="red")
```

Positive and Negative Histogram Plot For speechiness



```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:6: UserWarning:
```

```
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.
```

```
Please adapt your code to use either `displot` (a figure-level function with  
similar flexibility) or `histplot` (an axes-level function for histograms).
```

```
For a guide to updating your code to use the new functions, please see  
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751
```

```
    sns.distplot(pos_data,bins=30,label="Positive",color="green")
```

```
C:\Users\nithi\AppData\Local\Temp\ipykernel_11796\3023584536.py:7: UserWarning:
```

```
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.
```

```
Please adapt your code to use either `displot` (a figure-level function with  
similar flexibility) or `histplot` (an axes-level function for histograms).
```

```
For a guide to updating your code to use the new functions, please see  
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751
```

```
    sns.distplot(neg_data,bins=30,label="Negative",color="red")
```

Positive and Negative Histogram Plot For valence



In []: