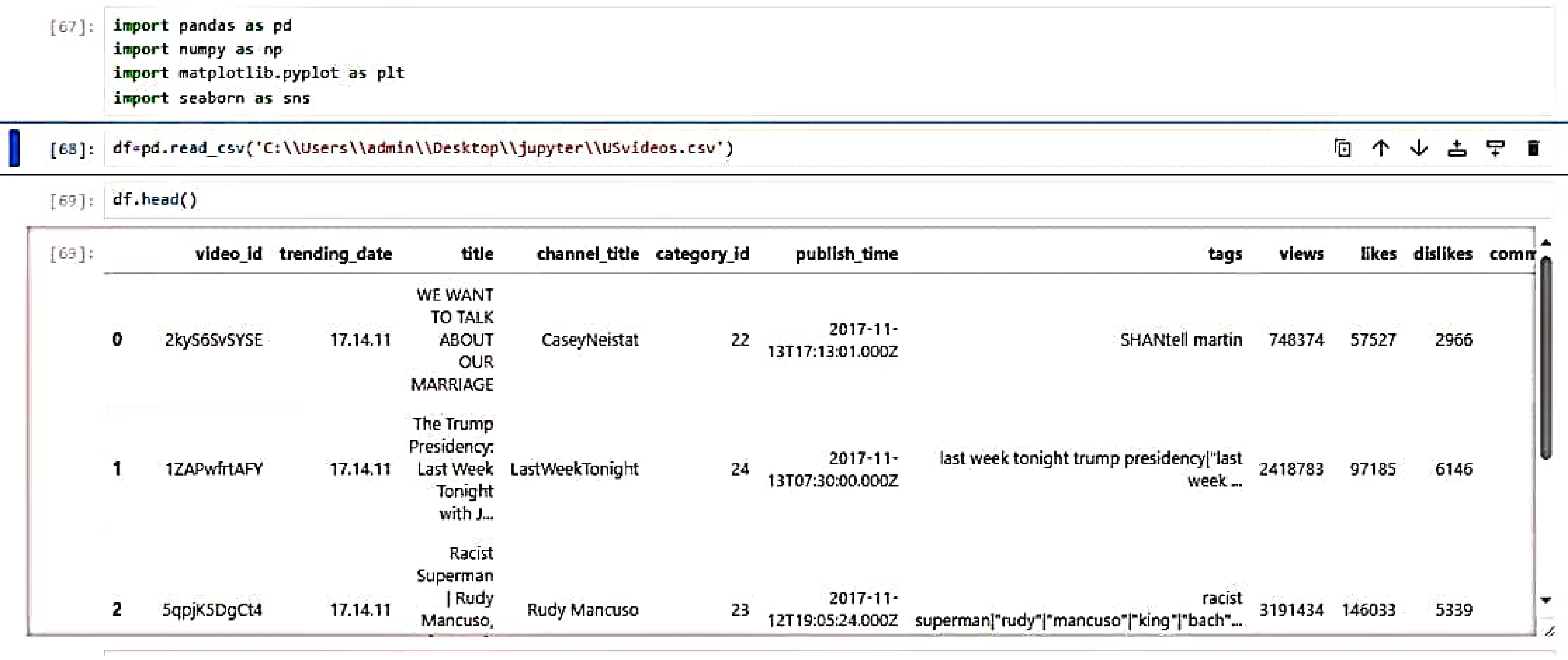


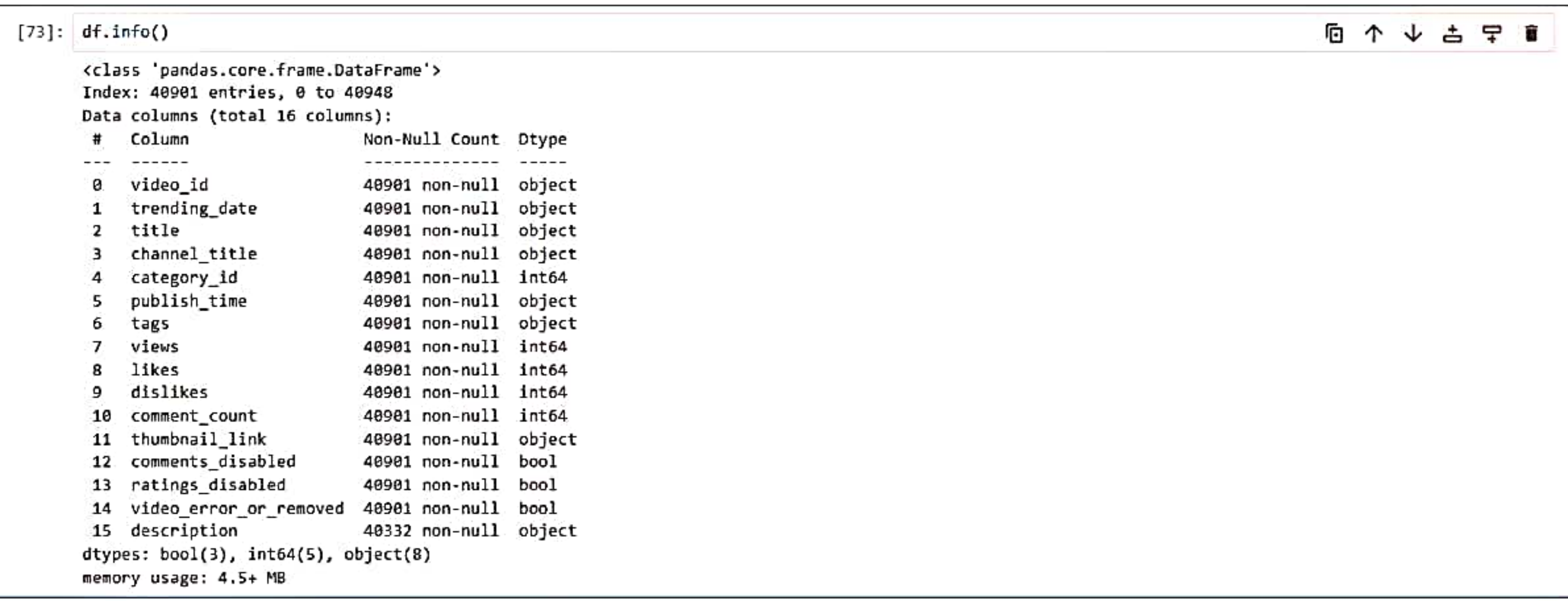
[67]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

[68]:
```
df=pd.read_csv('C:\\Users\\admin\\Desktop\\jupyter\\USvideos.csv')
```

[69]:
```
df.head()
```

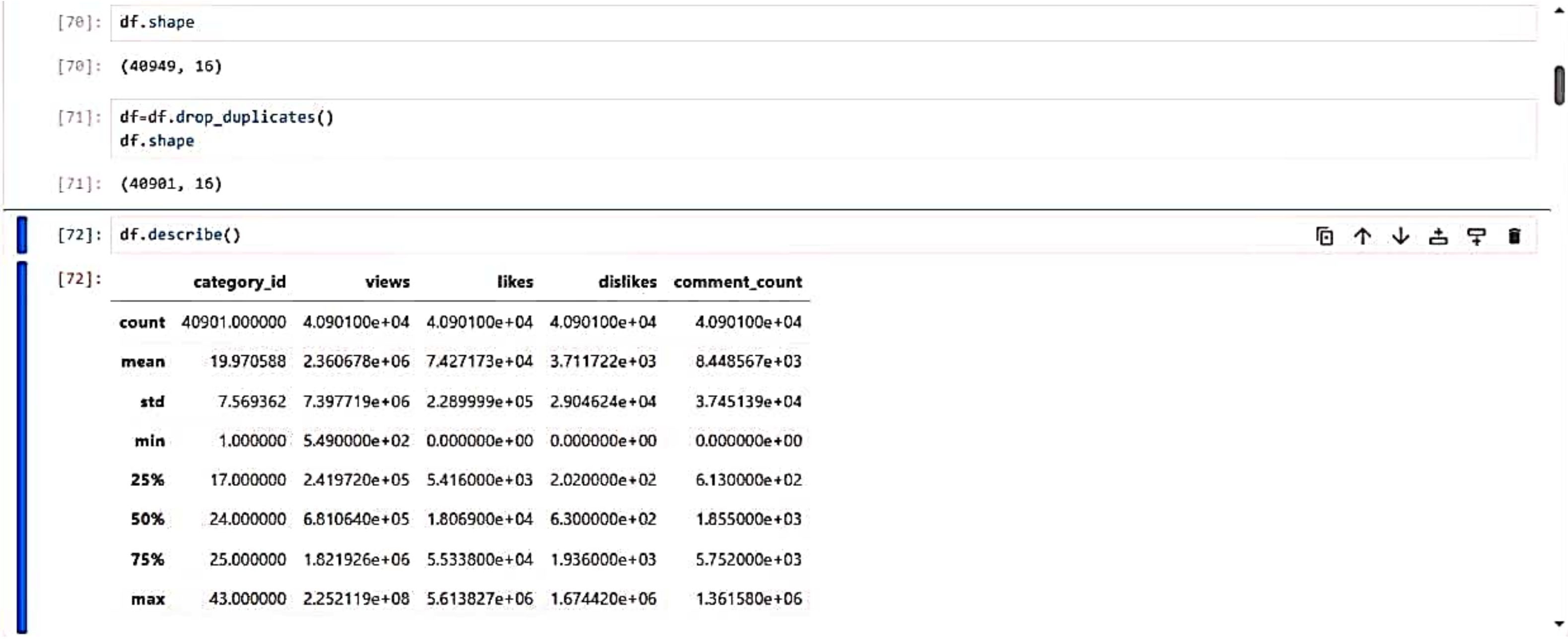
[69]:

	video_id	trending_date	title	channel_title	category_id	publish_time	tags	views	likes	dislikes	comm
0	2kyS6SvSYSE	17.14.11	WE WANT TO TALK ABOUT OUR MARRIAGE	CaseyNeistat	22	2017-11-13T17:13:01.000Z	SHANtell martin	748374	57527	2966	
1	1ZAPwfrtAFY	17.14.11	The Trump Presidency: Last Week Tonight with J...	LastWeekTonight	24	2017-11-13T07:30:00.000Z	last week tonight trump presidency|"last week ...	2418783	97185	6146	
2	5qpjK5DgCt4	17.14.11	Racist Superman | Rudy Mancuso,	Rudy Mancuso	23	2017-11-12T19:05:24.000Z	racist superman|"rudy"|"mancuso"|"king"|"bach"...	3191434	146033	5339	



```
[73]: df.info()
```

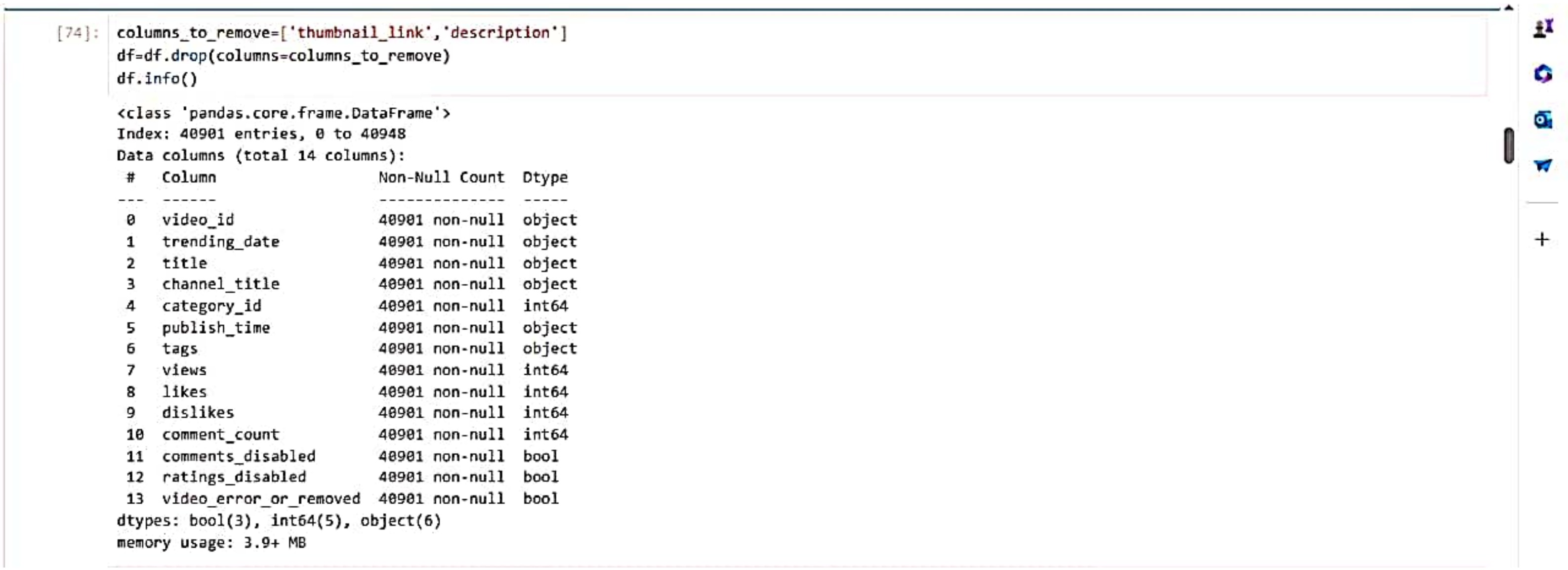
```
<class 'pandas.core.frame.DataFrame'>
Index: 40901 entries, 0 to 40948
Data columns (total 16 columns):
 #   Column                  Non-Null Count  Dtype
---  ------                  --------------  -----
 0   video_id                40901 non-null  object
 1   trending_date           40901 non-null  object
 2   title                   40901 non-null  object
 3   channel_title           40901 non-null  object
 4   category_id             40901 non-null  int64
 5   publish_time            40901 non-null  object
 6   tags                    40901 non-null  object
 7   views                   40901 non-null  int64
 8   likes                   40901 non-null  int64
 9   dislikes                40901 non-null  int64
 10  comment_count           40901 non-null  int64
 11  thumbnail_link          40901 non-null  object
 12  comments_disabled       40901 non-null  bool
 13  ratings_disabled        40901 non-null  bool
 14  video_error_or_removed  40901 non-null  bool
 15  description             40332 non-null  object
dtypes: bool(3), int64(5), object(8)
memory usage: 4.5+ MB
```



```
[70]: df.shape

[70]: (40949, 16)

[71]: df=df.drop_duplicates()
      df.shape

[71]: (40901, 16)

[72]: df.describe()
```

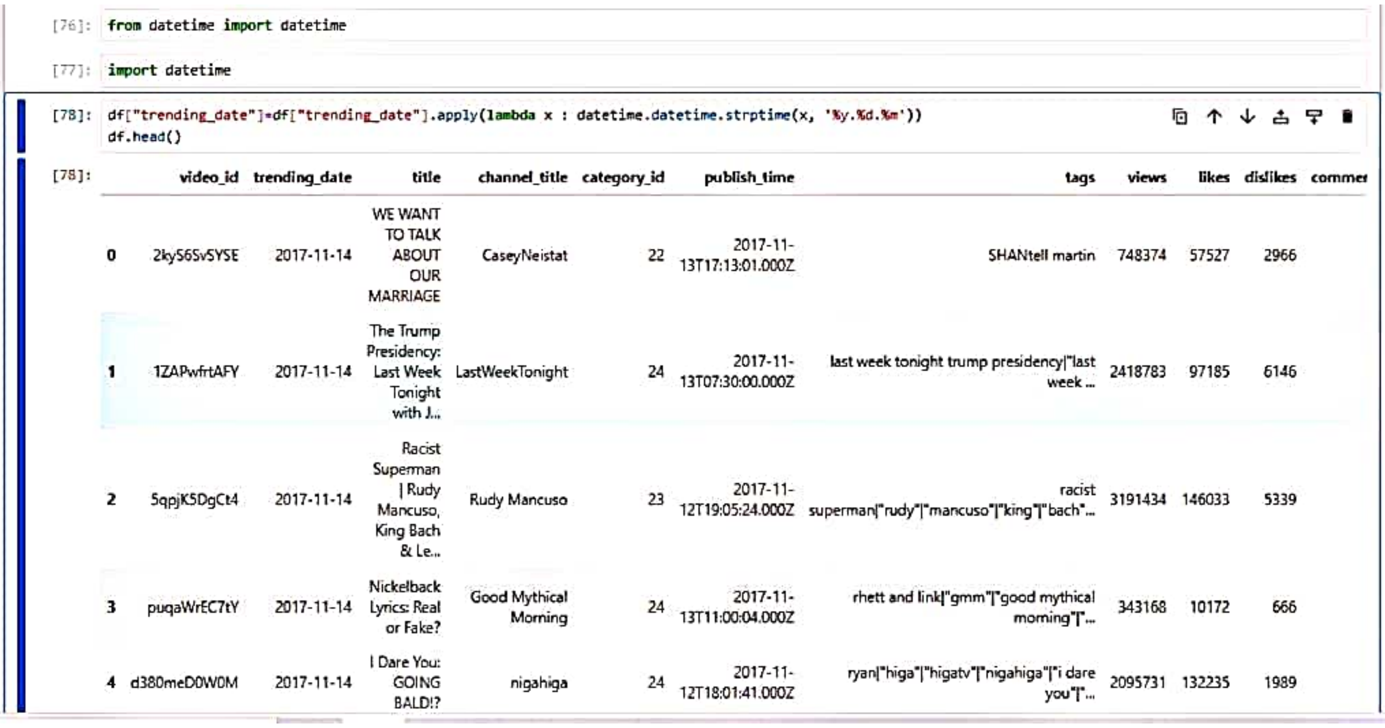
[72]:

	category_id	views	likes	dislikes	comment_count
count	40901.000000	4.090100e+04	4.090100e+04	4.090100e+04	4.090100e+04
mean	19.970588	2.360678e+06	7.427173e+04	3.711722e+03	8.448567e+03
std	7.569362	7.397719e+06	2.289999e+05	2.904624e+04	3.745139e+04
min	1.000000	5.490000e+02	0.000000e+00	0.000000e+00	0.000000e+00
25%	17.000000	2.419720e+05	5.416000e+03	2.020000e+02	6.130000e+02
50%	24.000000	6.810640e+05	1.806900e+04	6.300000e+02	1.855000e+03
75%	25.000000	1.821926e+06	5.533800e+04	1.936000e+03	5.752000e+03
max	43.000000	2.252119e+08	5.613827e+06	1.674420e+06	1.361580e+06



```
columns_to_remove=['thumbnail_link','description']
df=df.drop(columns=columns_to_remove)
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 40901 entries, 0 to 40948
Data columns (total 14 columns):
 #   Column                  Non-Null Count  Dtype 
---  ------                  --------------  ----- 
 0   video_id                40901 non-null  object
 1   trending_date           40901 non-null  object
 2   title                   40901 non-null  object
 3   channel_title           40901 non-null  object
 4   category_id             40901 non-null  int64 
 5   publish_time            40901 non-null  object
 6   tags                    40901 non-null  object
 7   views                   40901 non-null  int64 
 8   likes                   40901 non-null  int64 
 9   dislikes                40901 non-null  int64 
 10  comment_count           40901 non-null  int64 
 11  comments_disabled       40901 non-null  bool  
 12  ratings_disabled        40901 non-null  bool  
 13  video_error_or_removed  40901 non-null  bool  
dtypes: bool(3), int64(5), object(6)
memory usage: 3.9+ MB
```



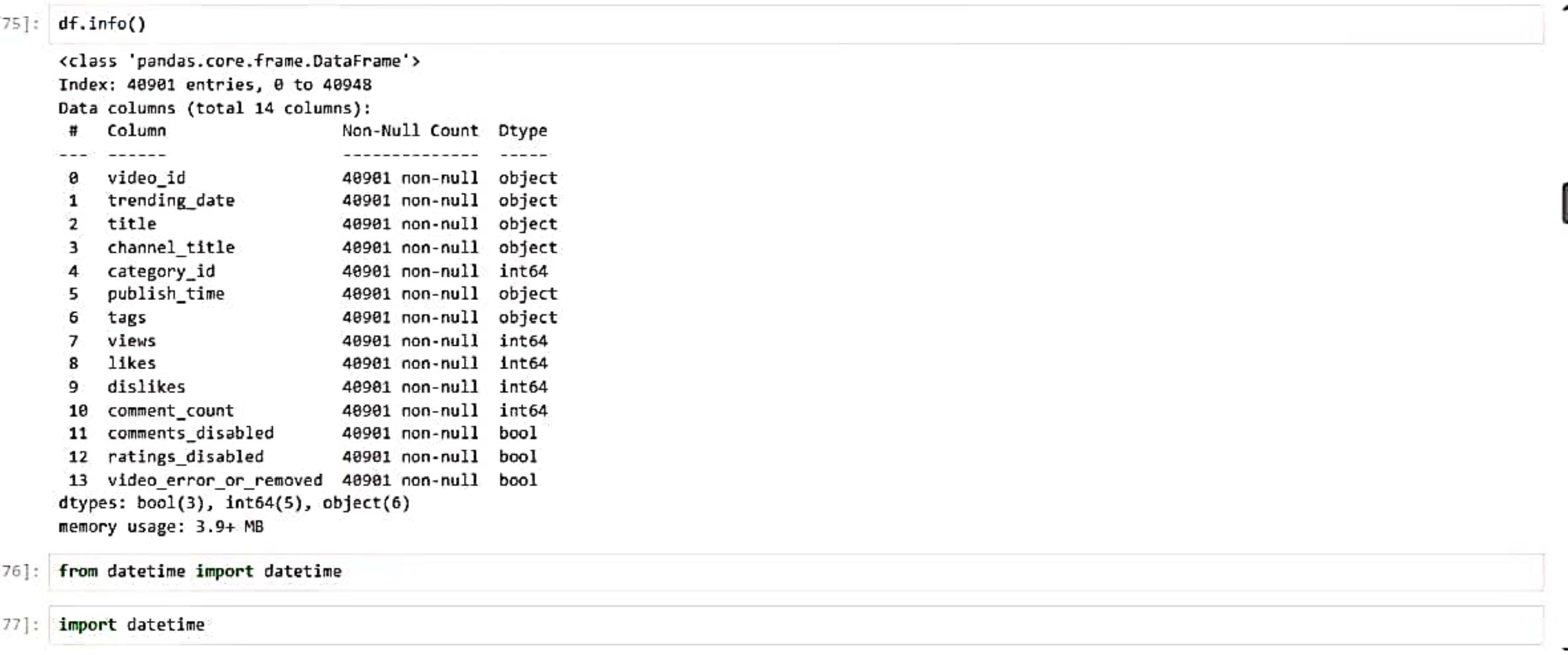
```
[76]: from datetime import datetime
```

```
[77]: import datetime
```

```
[78]: df["trending_date"]=df["trending_date"].apply(lambda x : datetime.datetime.strptime(x, '%y.%d.%m'))
      df.head()
```

[78]:

	video_id	trending_date	title	channel_title	category_id	publish_time	tags	views	likes	dislikes	commer
0	2kyS6SvSYSE	2017-11-14	WE WANT TO TALK ABOUT OUR MARRIAGE	CaseyNeistat	22	2017-11-13T17:13:01.000Z	SHANtell martin	748374	57527	2966	
1	1ZAPwfrtAFY	2017-11-14	The Trump Presidency: Last Week Tonight with J...	LastWeekTonight	24	2017-11-13T07:30:00.000Z	last week tonight trump presidency|"last week ...	2418783	97185	6146	
2	5qpjK5DgCt4	2017-11-14	Racist Superman | Rudy Mancuso, King Bach & Le...	Rudy Mancuso	23	2017-11-12T19:05:24.000Z	racist superman|"rudy"|"mancuso"|"king"|"bach"...	3191434	146033	5339	
3	puqaWrEC7tY	2017-11-14	Nickelback Lyrics: Real or Fake?	Good Mythical Morning	24	2017-11-13T11:00:04.000Z	rhett and link|"gmm"|"good mythical morning"|"...	343168	10172	666	
4	d380meD0W0M	2017-11-14	I Dare You: GOING BALD!?	nigahiga	24	2017-11-12T18:01:41.000Z	ryan|"higa"|"higatv"|"nigahiga"|"i dare you"|"...	2095731	132235	1989	

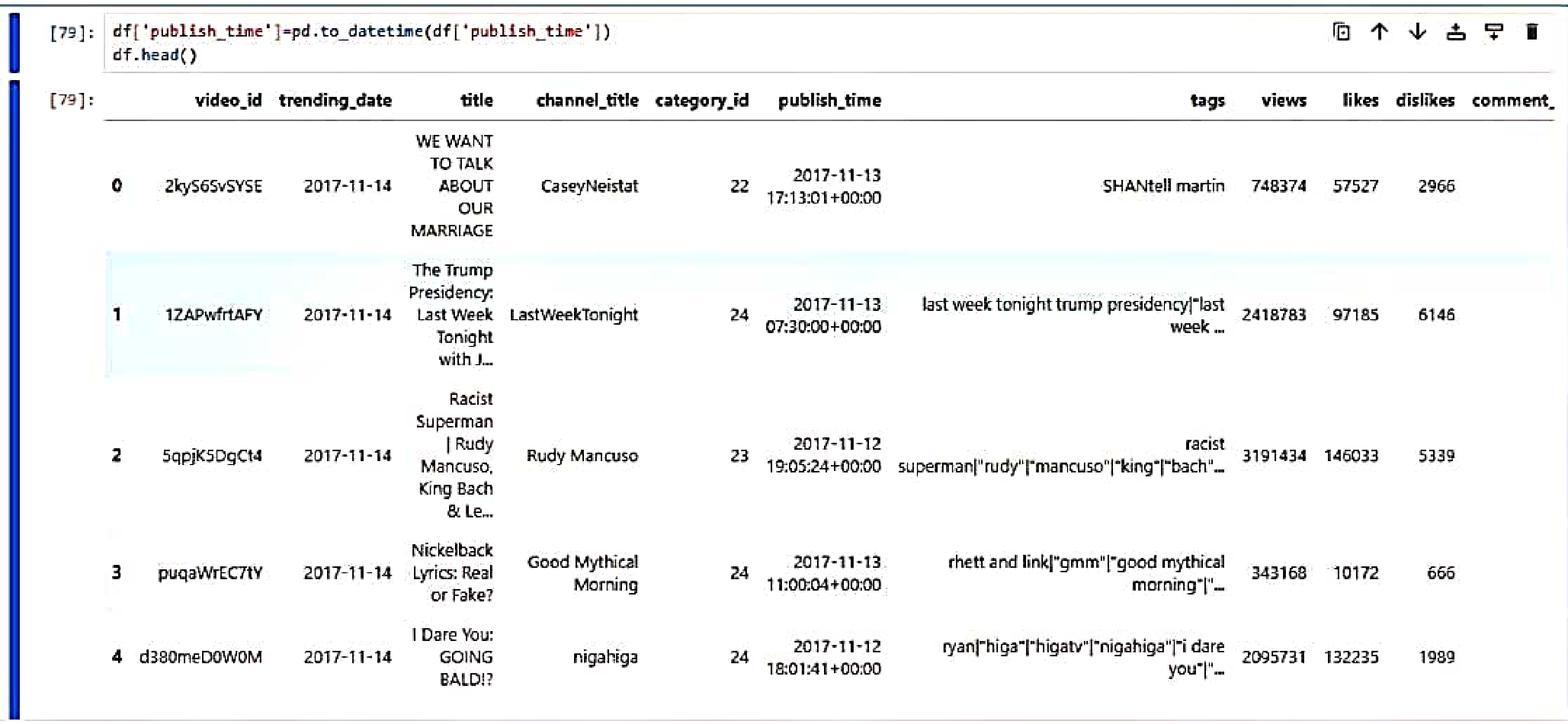


```
75]: df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 40901 entries, 0 to 40948
Data columns (total 14 columns):
 #   Column                  Non-Null Count  Dtype
---  ------                  --------------  -----
 0   video_id                40901 non-null  object
 1   trending_date           40901 non-null  object
 2   title                   40901 non-null  object
 3   channel_title           40901 non-null  object
 4   category_id             40901 non-null  int64
 5   publish_time            40901 non-null  object
 6   tags                    40901 non-null  object
 7   views                   40901 non-null  int64
 8   likes                   40901 non-null  int64
 9   dislikes                40901 non-null  int64
 10  comment_count           40901 non-null  int64
 11  comments_disabled       40901 non-null  bool
 12  ratings_disabled        40901 non-null  bool
 13  video_error_or_removed  40901 non-null  bool
dtypes: bool(3), int64(5), object(6)
memory usage: 3.9+ MB
```

```
76]: from datetime import datetime
```

```
77]: import datetime
```

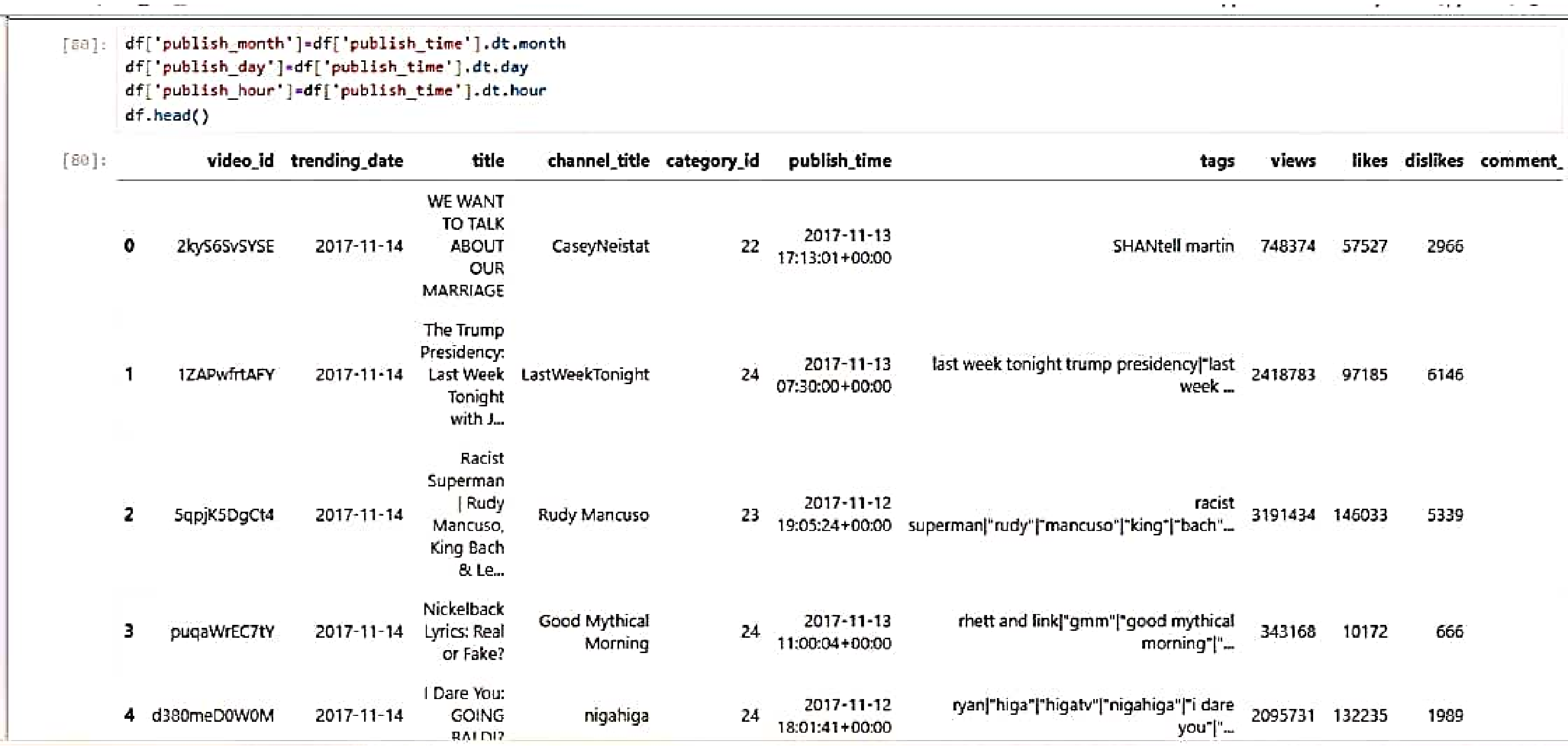


[79]:

```
df['publish_time']=pd.to_datetime(df['publish_time'])
df.head()
```

[79]:

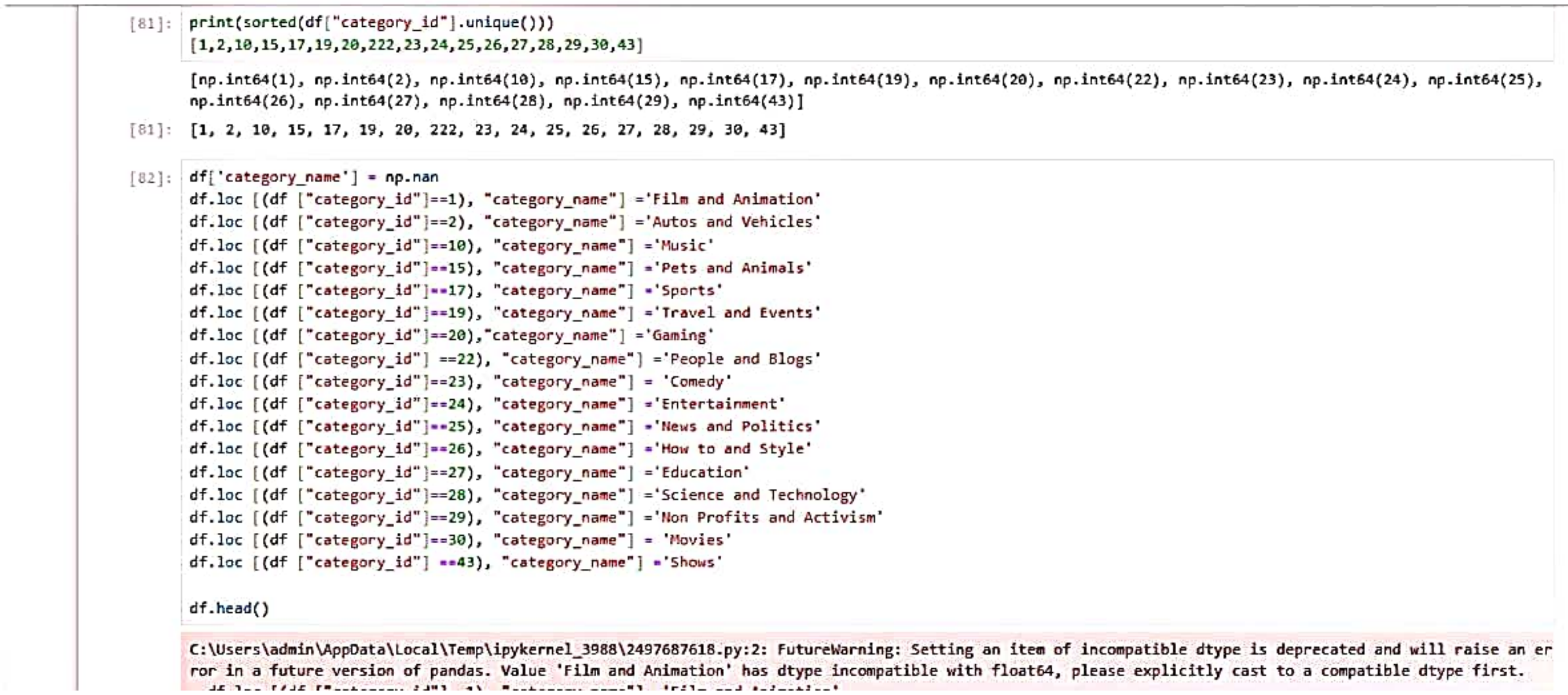
	video_id	trending_date	title	channel_title	category_id	publish_time	tags	views	likes	dislikes	comment_
0	2kyS6SvSYSE	2017-11-14	WE WANT TO TALK ABOUT OUR MARRIAGE	CaseyNeistat	22	2017-11-13 17:13:01+00:00	SHANtell martin	748374	57527	2966	
1	1ZAPwfrtAFY	2017-11-14	The Trump Presidency: Last Week Tonight with J...	LastWeekTonight	24	2017-11-13 07:30:00+00:00	last week tonight trump presidency|"last week ...	2418783	97185	6146	
2	5qpjK5DgCt4	2017-11-14	Racist Superman | Rudy Mancuso, King Bach & Le...	Rudy Mancuso	23	2017-11-12 19:05:24+00:00	racist superman|"rudy"|"mancuso"|"king"|"bach"...	3191434	146033	5339	
3	puqaWrEC7tY	2017-11-14	Nickelback Lyrics: Real or Fake?	Good Mythical Morning	24	2017-11-13 11:00:04+00:00	rhett and link|"gmm"|"good mythical morning"|"...	343168	10172	666	
4	d380meD0W0M	2017-11-14	I Dare You: GOING BALD!?	nigahiga	24	2017-11-12 18:01:41+00:00	ryan|"higa"|"higatv"|"nigahiga"|"i dare you"|"...	2095731	132235	1989	



```
[88]: df['publish_month']=df['publish_time'].dt.month
      df['publish_day']=df['publish_time'].dt.day
      df['publish_hour']=df['publish_time'].dt.hour
      df.head()
```

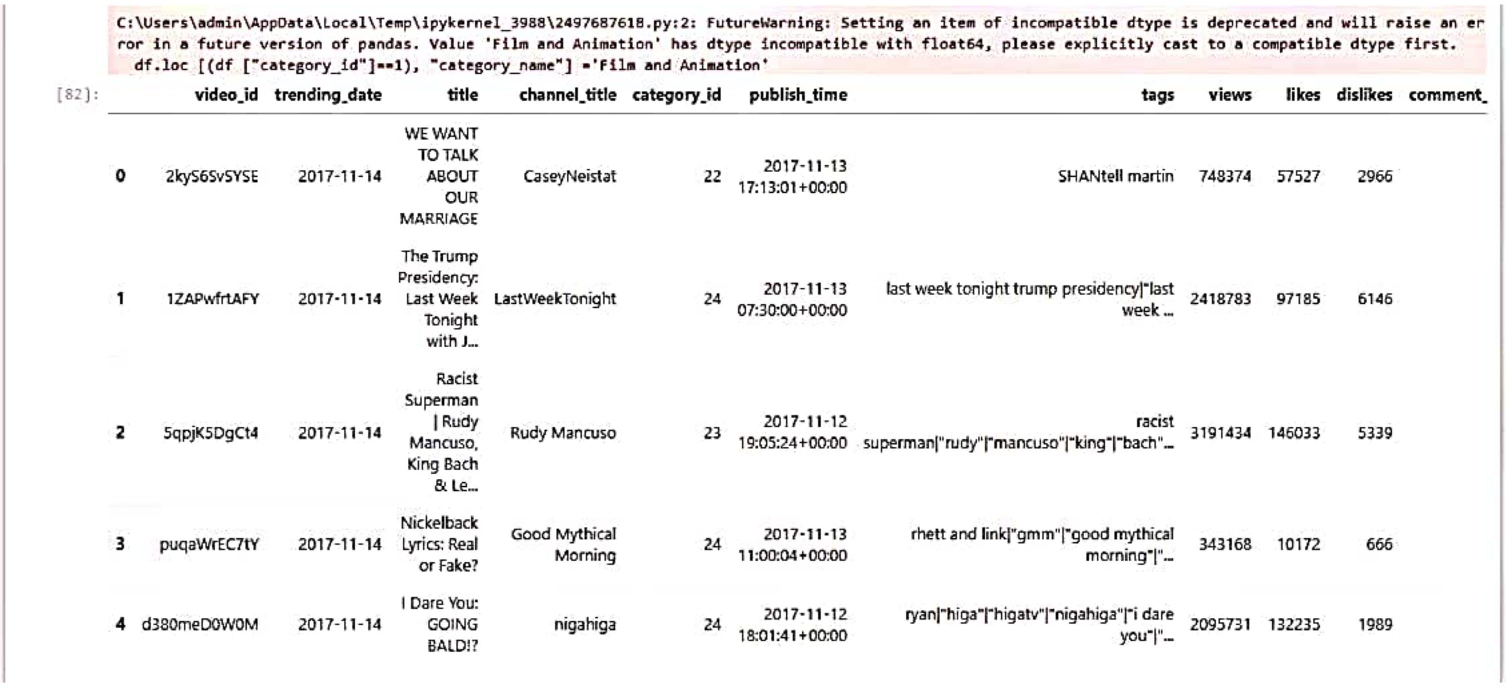
[88]:

	video_id	trending_date	title	channel_title	category_id	publish_time	tags	views	likes	dislikes	comment_
0	2kyS6SvSYSE	2017-11-14	WE WANT TO TALK ABOUT OUR MARRIAGE	CaseyNeistat	22	2017-11-13 17:13:01+00:00	SHANtell martin	748374	57527	2966	
1	1ZAPwfrtAFY	2017-11-14	The Trump Presidency: Last Week Tonight with J...	LastWeekTonight	24	2017-11-13 07:30:00+00:00	last week tonight trump presidency|"last week ...	2418783	97185	6146	
2	5qpjK5DgCt4	2017-11-14	Racist Superman | Rudy Mancuso, King Bach & Le...	Rudy Mancuso	23	2017-11-12 19:05:24+00:00	racist superman|"rudy"|"mancuso"|"king"|"bach"...	3191434	146033	5339	
3	puqaWrEC7tY	2017-11-14	Nickelback Lyrics: Real or Fake?	Good Mythical Morning	24	2017-11-13 11:00:04+00:00	rhett and link|"gmm"|"good mythical morning"|"...	343168	10172	666	
4	d380meD0W0M	2017-11-14	I Dare You: GOING BALD!?	nigahiga	24	2017-11-12 18:01:41+00:00	ryan|"higa"|"higatv"|"nigahiga"|"i dare you"|"...	2095731	132235	1989	



```
[81]: print(sorted(df["category_id"].unique()))
      [1,2,10,15,17,19,20,222,23,24,25,26,27,28,29,30,43]

      [np.int64(1), np.int64(2), np.int64(10), np.int64(15), np.int64(17), np.int64(19), np.int64(20), np.int64(22), np.int64(23), np.int64(24), np.int64(25),
      np.int64(26), np.int64(27), np.int64(28), np.int64(29), np.int64(43)]

[81]: [1, 2, 10, 15, 17, 19, 20, 222, 23, 24, 25, 26, 27, 28, 29, 30, 43]
```

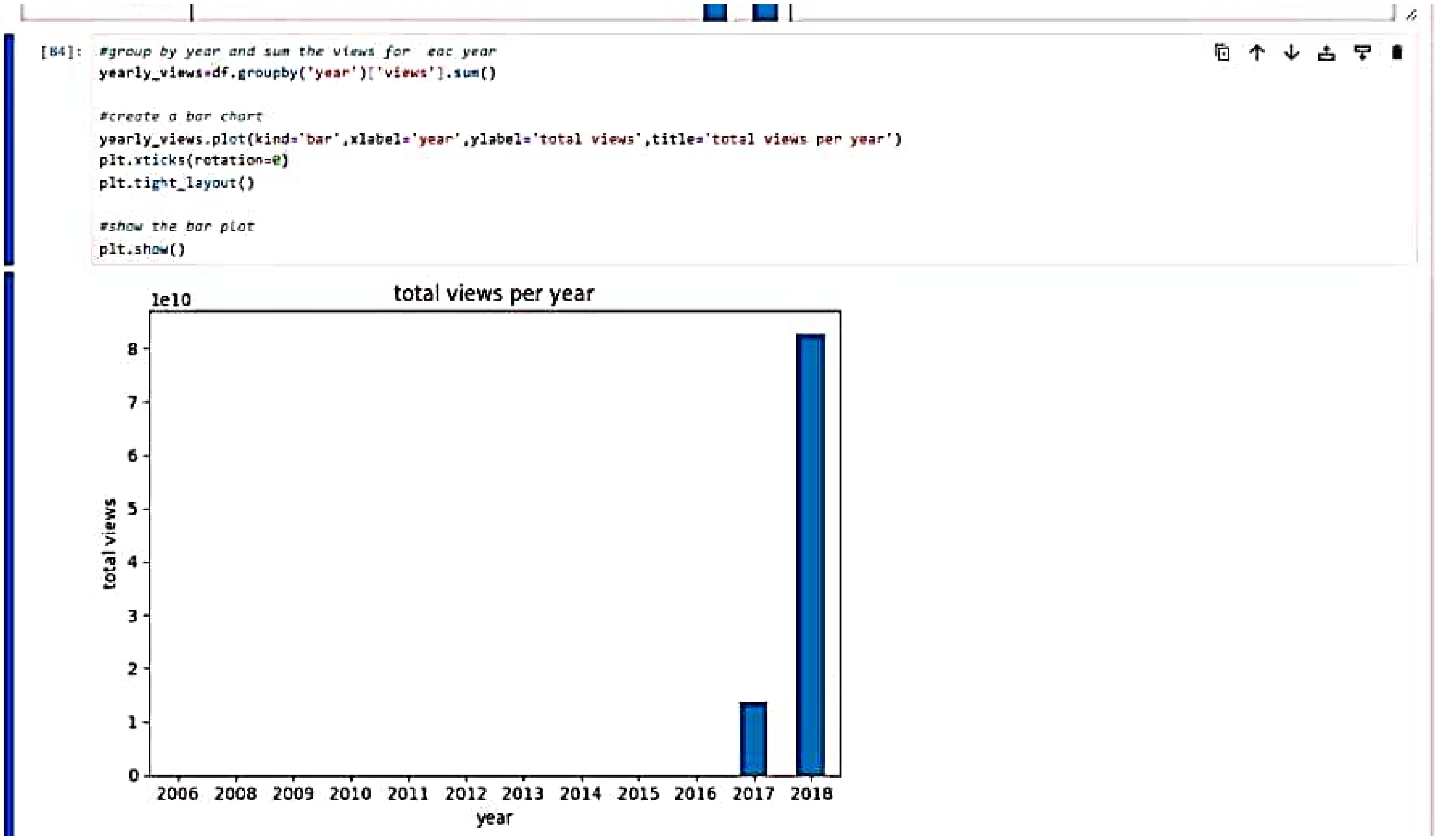
```
[82]: df['category_name'] = np.nan
      df.loc [(df ["category_id"]==1), "category_name"] ='Film and Animation'
      df.loc [(df ["category_id"]==2), "category_name"] ='Autos and Vehicles'
      df.loc [(df ["category_id"]==10), "category_name"] ='Music'
      df.loc [(df ["category_id"]==15), "category_name"] ='Pets and Animals'
      df.loc [(df ["category_id"]==17), "category_name"] ='Sports'
      df.loc [(df ["category_id"]==19), "category_name"] ='Travel and Events'
      df.loc [(df ["category_id"]==20),"category_name"] ='Gaming'
      df.loc [(df ["category_id"] ==22), "category_name"] ='People and Blogs'
      df.loc [(df ["category_id"]==23), "category_name"] = 'Comedy'
      df.loc [(df ["category_id"]==24), "category_name"] ='Entertainment'
      df.loc [(df ["category_id"]==25), "category_name"] ='News and Politics'
      df.loc [(df ["category_id"]==26), "category_name"] ='How to and Style'
      df.loc [(df ["category_id"]==27), "category_name"] ='Education'
      df.loc [(df ["category_id"]==28), "category_name"] ='Science and Technology'
      df.loc [(df ["category_id"]==29), "category_name"] ='Non Profits and Activism'
      df.loc [(df ["category_id"]==30), "category_name"] = 'Movies'
      df.loc [(df ["category_id"] ==43), "category_name"] ='Shows'

      df.head()

      C:\Users\admin\AppData\Local\Temp\ipykernel_3988\2497687618.py:2: FutureWarning: Setting an item of incompatible dtype is deprecated and will raise an er
      ror in a future version of pandas. Value 'Film and Animation' has dtype incompatible with float64, please explicitly cast to a compatible dtype first.
```



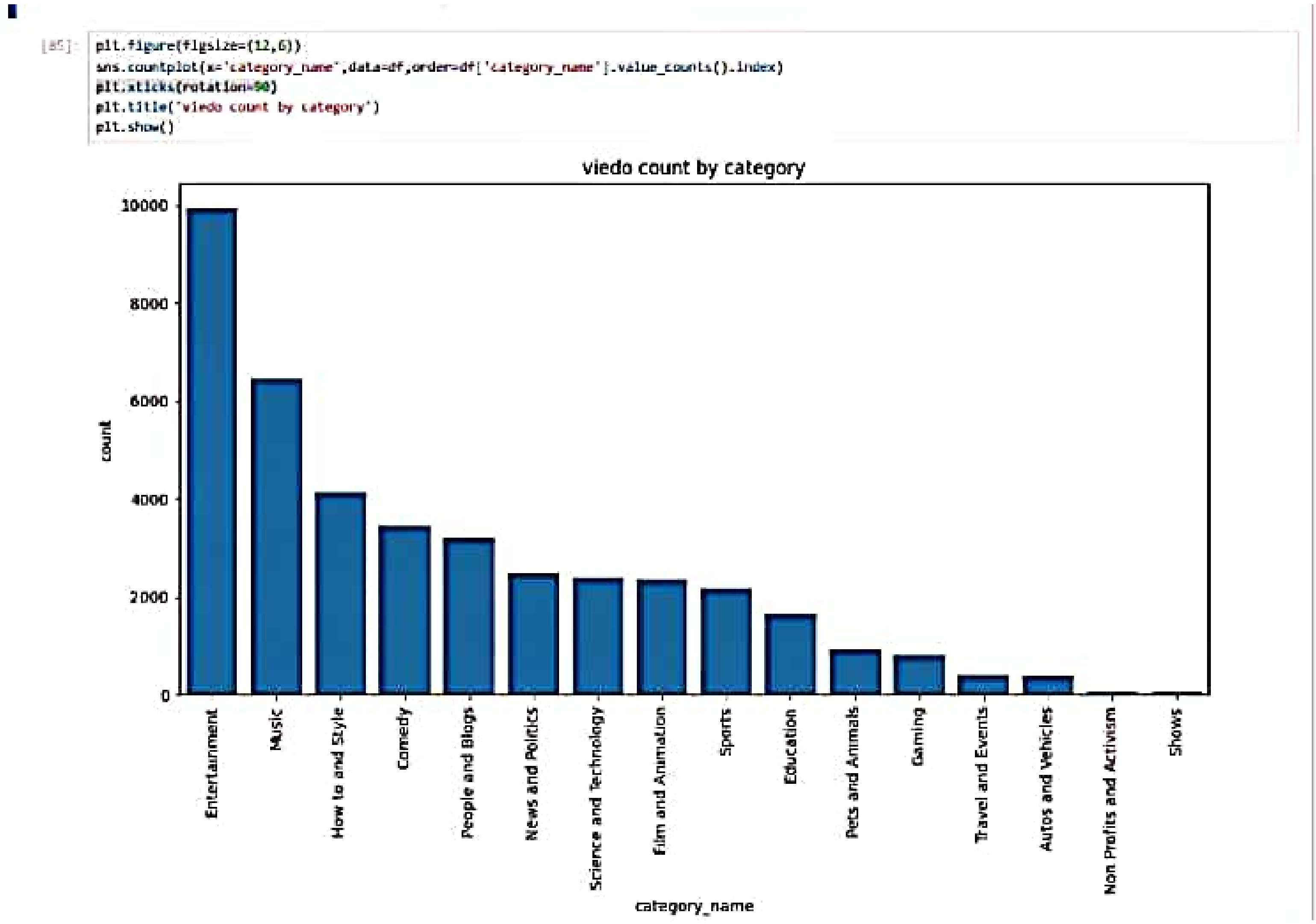
```
C:\Users\admin\AppData\Local\Temp\ipykernel_3988\2497687618.py:2: FutureWarning: Setting an item of incompatible dtype is deprecated and will raise an er
ror in a future version of pandas. Value 'Film and Animation' has dtype incompatible with float64, please explicitly cast to a compatible dtype first.
  df.loc [(df ["category_id"]==1), "category_name"] ='Film and Animation'
```

[82]:

	video_id	trending_date	title	channel_title	category_id	publish_time	tags	views	likes	dislikes	comment_
0	2kyS6SvSYSE	2017-11-14	WE WANT TO TALK ABOUT OUR MARRIAGE	CaseyNeistat	22	2017-11-13 17:13:01+00:00	SHANtell martin	748374	57527	2966	
1	1ZAPwfrtAFY	2017-11-14	The Trump Presidency: Last Week Tonight with J...	LastWeekTonight	24	2017-11-13 07:30:00+00:00	last week tonight trump presidency|"last week ...	2418783	97185	6146	
2	5qpjK5DgCt4	2017-11-14	Racist Superman | Rudy Mancuso, King Bach & Le...	Rudy Mancuso	23	2017-11-12 19:05:24+00:00	racist superman|"rudy"|"mancuso"|"king"|"bach"...	3191434	146033	5339	
3	puqaWrEC7tY	2017-11-14	Nickelback Lyrics: Real or Fake?	Good Mythical Morning	24	2017-11-13 11:00:04+00:00	rhett and link|"gmm"|"good mythical morning"|"...	343168	10172	666	
4	d380meD0W0M	2017-11-14	I Dare You: GOING BALD!?	nigahiga	24	2017-11-12 18:01:41+00:00	ryan|"higa"|"higatv"|"nigahiga"|"i dare you"|"...	2095731	132235	1989	

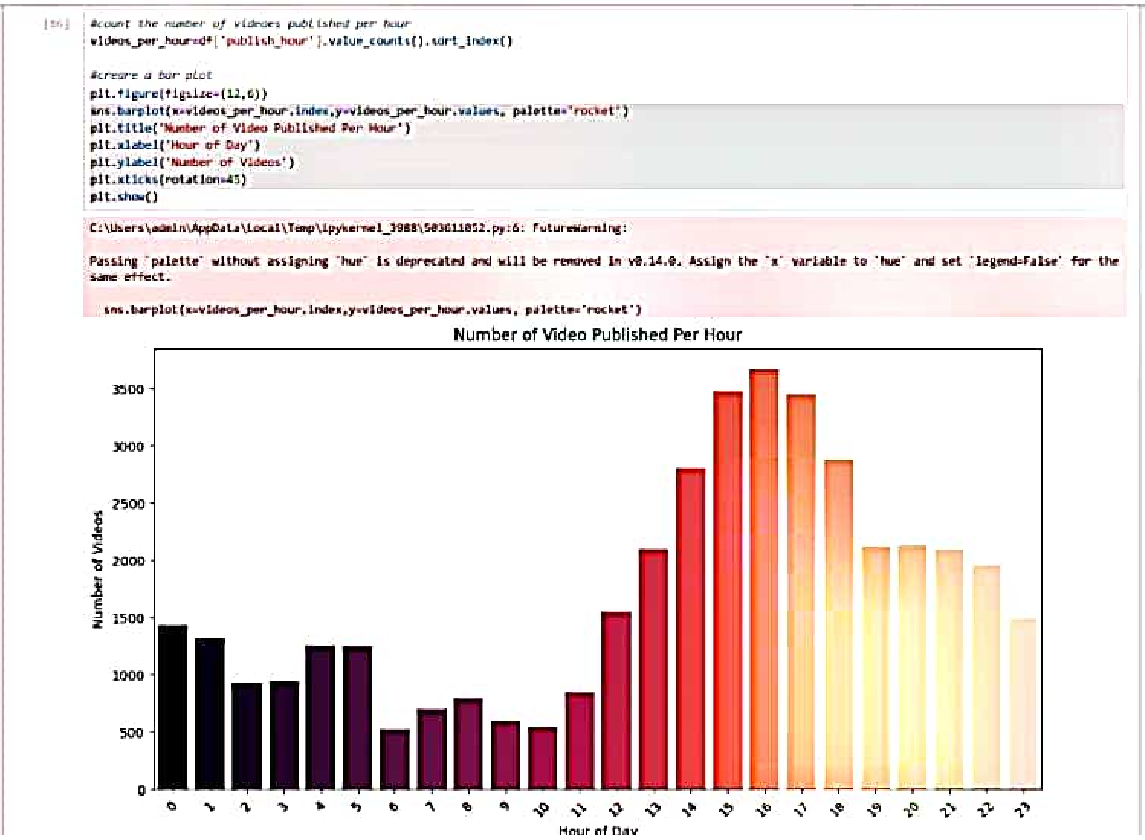


```
[84]: #group by year and sum the views for  eac year
      yearly_views=df.groupby('year')['views'].sum()

      #create a bar chart
      yearly_views.plot(kind='bar',xlabel='year',ylabel='total views',title='total views per year')
      plt.xticks(rotation=0)
      plt.tight_layout()

      #show the bar plot
      plt.show()
```



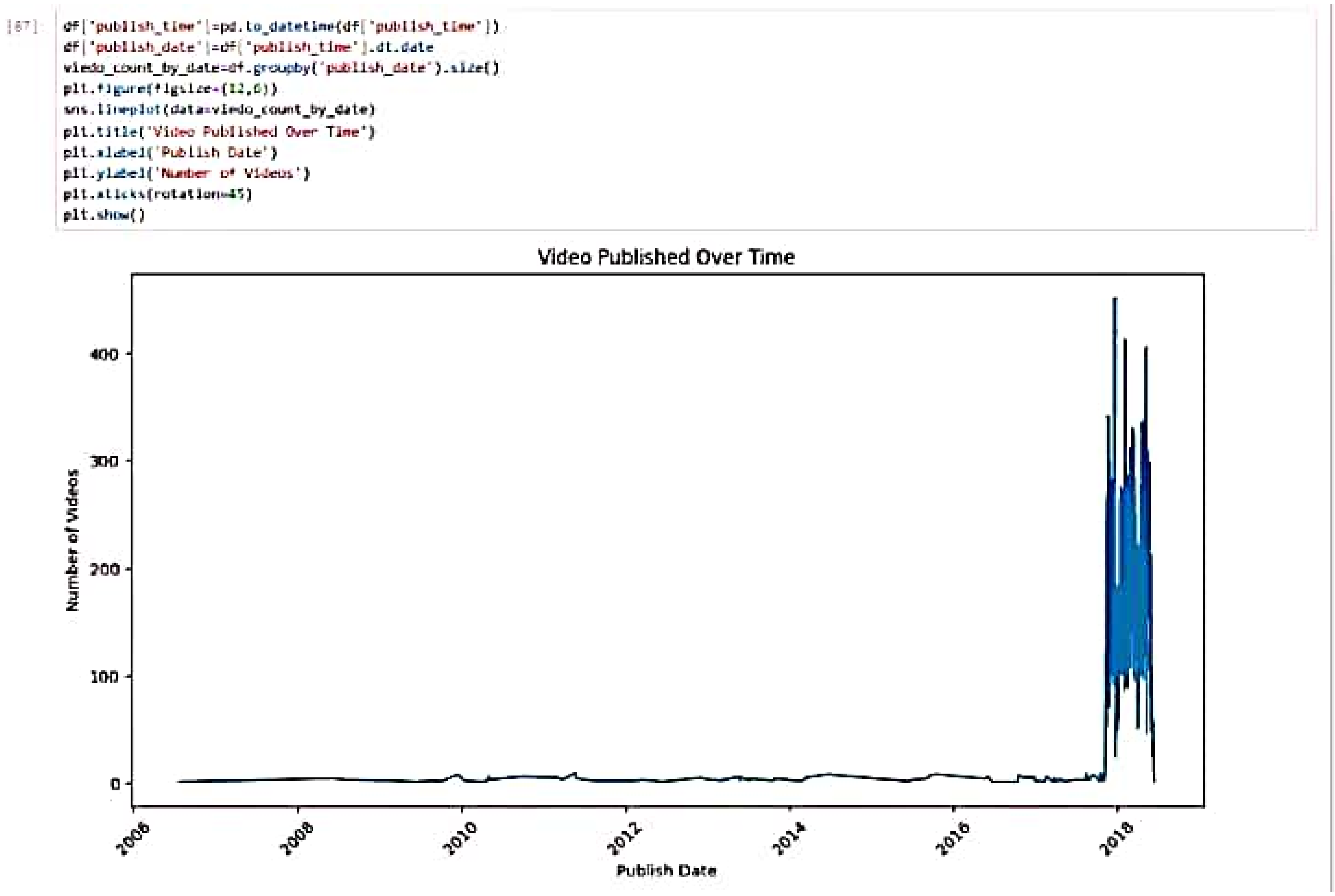
[85]:

```
plt.figure(figsize=(12,6))
sns.countplot(x='category_name',data=df,order=df['category_name'].value_counts().index)
plt.xticks(rotation=90)
plt.title('viedo count by category')
plt.show()
```

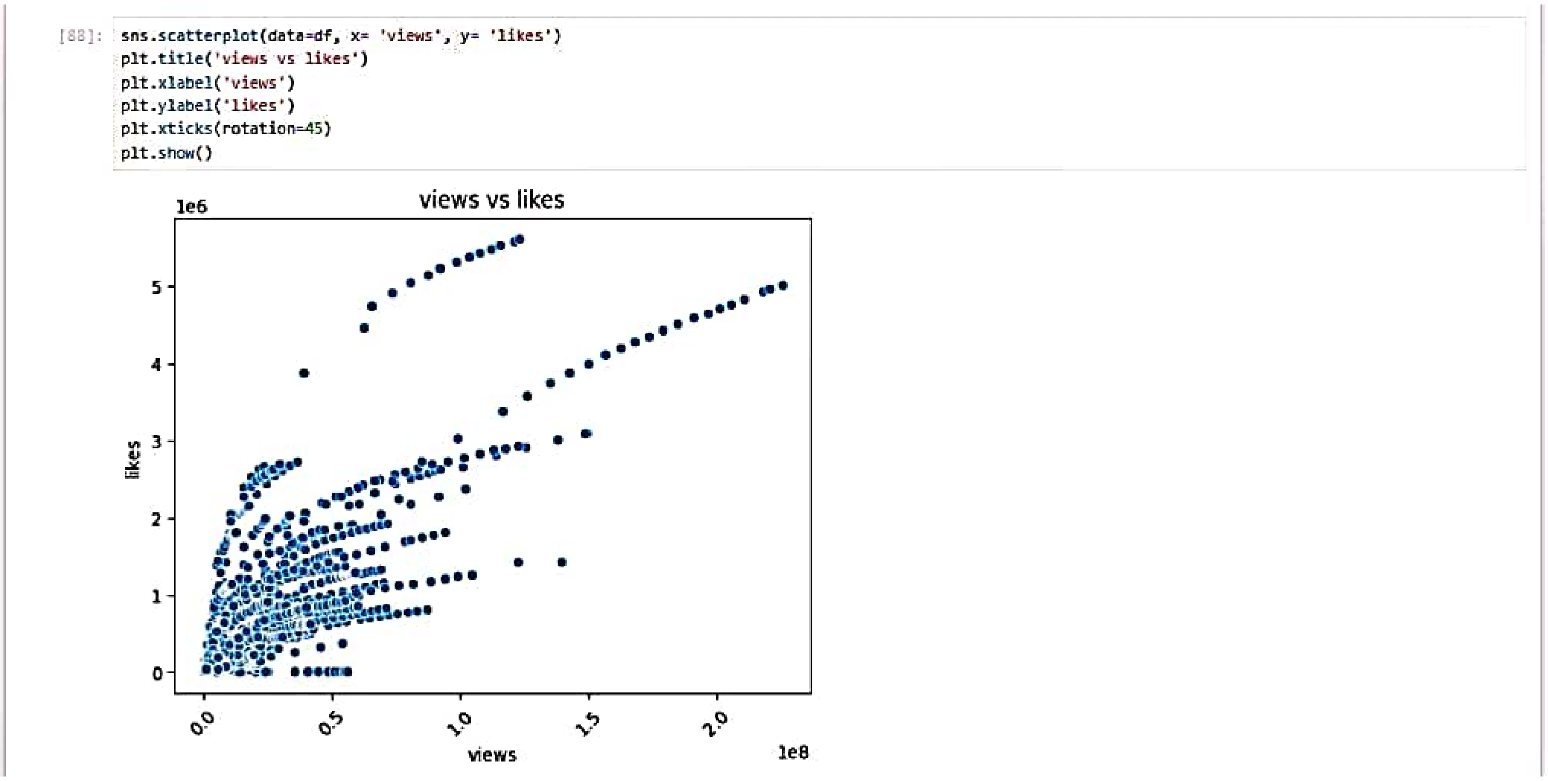


```
[56]  #count the number of videoes published per hour
      videos_per_hour=df['publish_hour'].value_counts().sort_index()

      #create a bar plot
      plt.figure(figsize=(12,6))
      sns.barplot(x=videos_per_hour.index,y=videos_per_hour.values, palette='rocket')
      plt.title('Number of Video Published Per Hour')
      plt.xlabel('Hour of Day')
      plt.ylabel('Number of Videos')
      plt.xticks(rotation=45)
      plt.show()
```

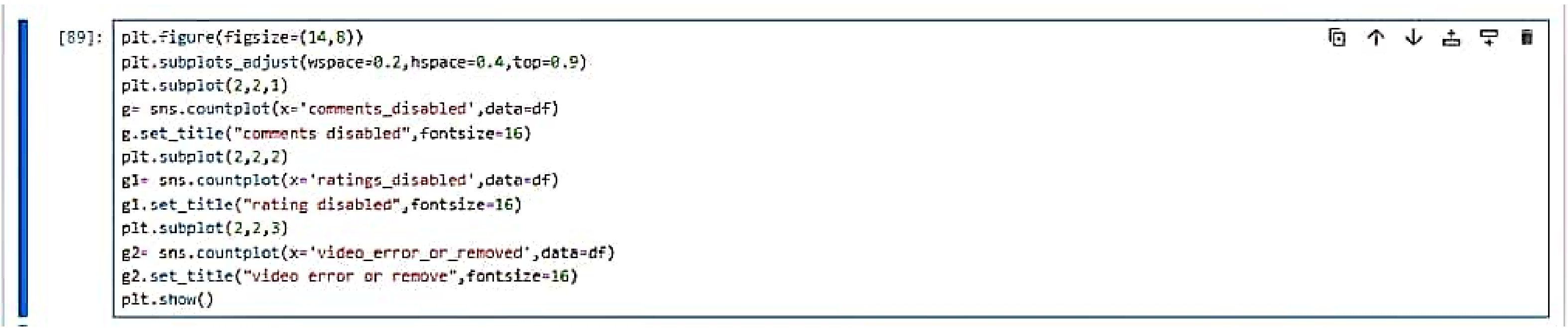
```
C:\Users\admin\AppData\Local\Temp\ipykernel_3988\503611052.py:6: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the
same effect.

  sns.barplot(x=videos_per_hour.index,y=videos_per_hour.values, palette='rocket')
```



```
[67]: df['publish_time']=pd.to_datetime(df['publish_time'])
      df['publish_date']=df['publish_time'].dt.date
      viedo_count_by_date=df.groupby('publish_date').size()
      plt.figure(figsize=(12,6))
      sns.lineplot(data=viedo_count_by_date)
      plt.title('Video Published Over Time')
      plt.xlabel('Publish Date')
      plt.ylabel('Number of Videos')
      plt.xticks(rotation=45)
      plt.show()
```

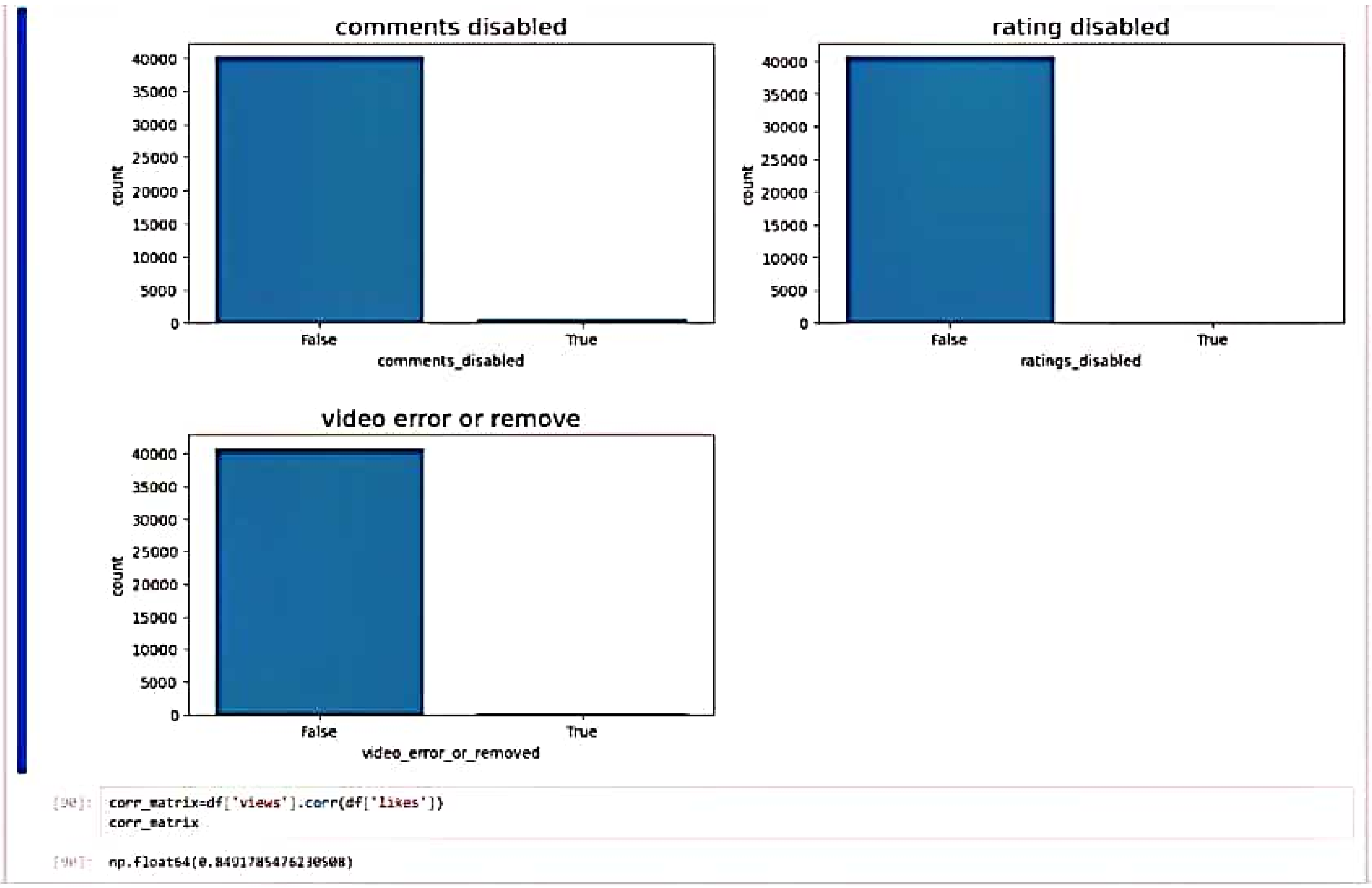


```
[88]: sns.scatterplot(data=df, x= 'views', y= 'likes')
      plt.title('views vs likes')
      plt.xlabel('views')
      plt.ylabel('likes')
      plt.xticks(rotation=45)
      plt.show()
```



[89]:

```
plt.figure(figsize=(14,8))
plt.subplots_adjust(wspace=0.2,hspace=0.4,top=0.9)
plt.subplot(2,2,1)
g= sns.countplot(x='comments_disabled',data=df)
g.set_title("comments disabled",fontsize=16)
plt.subplot(2,2,2)
g1= sns.countplot(x='ratings_disabled',data=df)
g1.set_title("rating disabled",fontsize=16)
plt.subplot(2,2,3)
g2= sns.countplot(x='video_error_or_removed',data=df)
g2.set_title("video error or remove",fontsize=16)
plt.show()
```



```
[90]: corr_matrix=df['views'].corr(df['likes'])
      corr_matrix
```

```
[90]: np.float64(0.8491785476230508)
```