In [2]:
```python
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from datetime import datetime
```

In [3]:
```python
df = pd.read_csv('C:\\Users\\pujit\\Downloads\\USvideos.csv')
```

In [4]:
```python
df.head()
```

Out[4]:

	video_id	trending_date	title	channel_title	category_id	publish_time	tags	views	likes	dislikes	comment_count	thumbnail_link
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	15954	https://i.ytimg.com/vi/2kyS6SvSYSE/default.jpg
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	12703	https://i.ytimg.com/vi/1ZAPwfrtAFY/default.jpg
2	5qpjK5DgCt4	17.14.11	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	8181	https://i.ytimg.com/vi/5qpjK5DgCt4/default.jpg
3	puqaWrEC7tY	17.14.11	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	2146	https://i.ytimg.com/vi/puqaWrEC7tY/default.jpg
4	d380meD0W0M	17.14.11	I Dare You: GOING BALD!?	nigahiga	24	2017-11-12T18:01:41.000Z	ryan|"higa"|"higatv"|"nigahiga"|"i dare you"|"...	2095731	132235	1989	17518	https://i.ytimg.com/vi/d380meD0W0M/default.jpg

In [5]:
```python
df.shape
```

Out[5]: (40949, 16)

In [6]:
```python
df = df.drop_duplicates()
df.shape
```

Out[6]: (40901, 16)

In [7]:
```python
df.describe()
```

Out[7]:

	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

In [8]:
```python
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
```

In [9]:
```python
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
```

In [10]:
```python
from datetime import datetime
```

In [11]:
```python
import datetime
```

In [12]:
```python
df["trending_date"] = df["trending_date"].apply(lambda x : datetime.datetime.strptime(x, '%y.%d.%m'))
df.head()
```

Out[12]:

	video_id	trending_date	title	channel_title	category_id	publish_time	tags	views	likes	dislikes	comment_count	comments_disabled	ratings_disabled
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	15954	False	False
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	12703	False	False
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	8181	False	False
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	2146	False	False
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	17518	False	False

In [13]:
```python
df['publish_time'] = pd.to_datetime(df['publish_time'])
df.head()
```

Out[13]:

	video_id	trending_date	title	channel_title	category_id	publish_time	tags	views	likes	dislikes	comment_count	comments_disabled	ratings_disabled
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	15954	False	False
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	12703	False	False
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	8181	False	False
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	2146	False	False
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	17518	False	False

In [14]:
```python
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(2)
```

Out[14]:

	video_id	trending_date	title	channel_title	category_id	publish_time	tags	views	likes	dislikes	comment_count	comments_disabled	ratings_disabled	video_error_or_removed
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	15954	False	False	False
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	12703	False	False	False

In [15]:
```python
print(sorted(df["category_id"].unique()))
[1,2,10,15,17,19,20,22,23,24,25,26,27,28,29,30,43]
```

```
[1, 2, 10, 15, 17, 19, 20, 22, 23, 24, 25, 26, 27, 28, 29, 43]
```

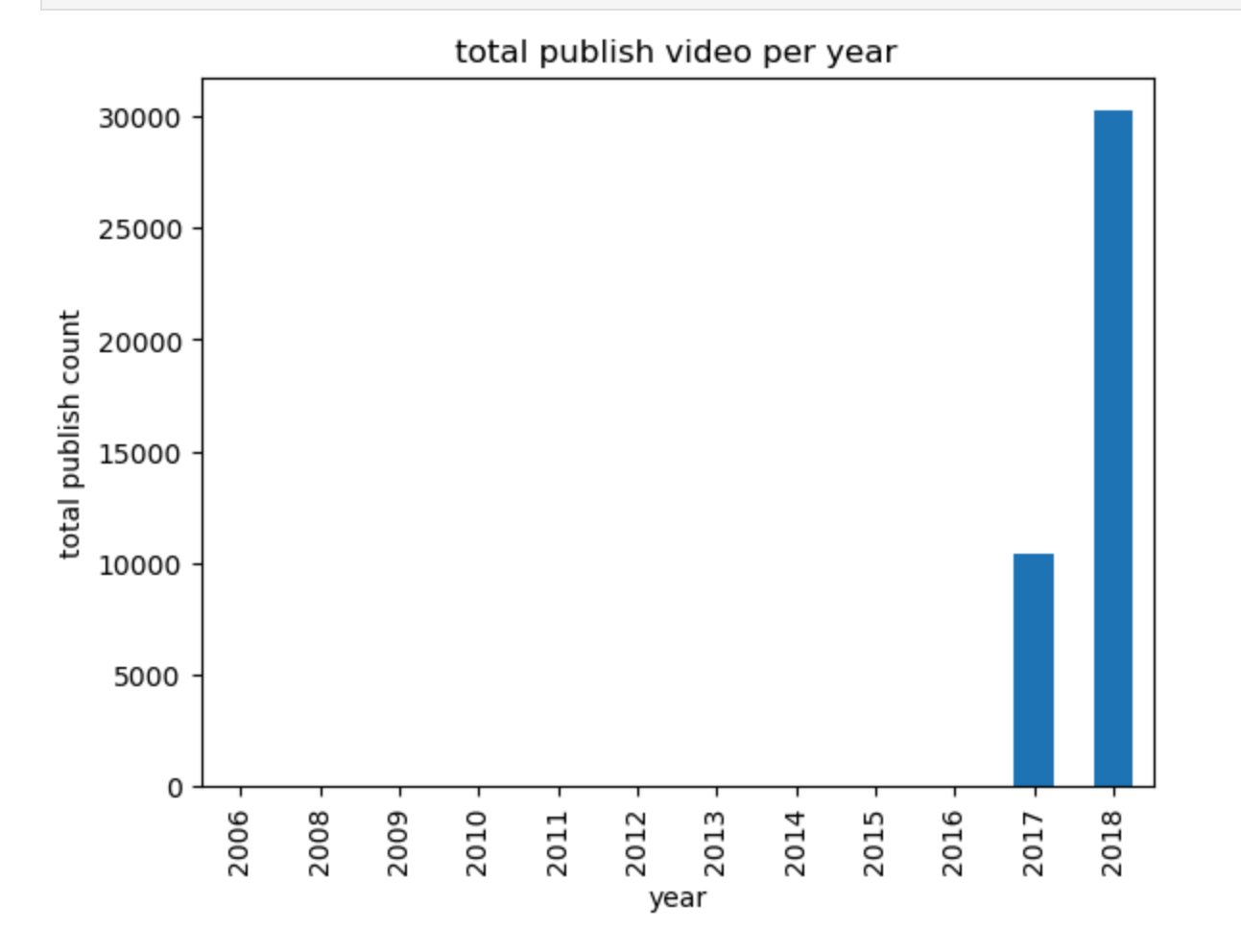
Out[15]: [1, 2, 10, 15, 17, 19, 20, 22, 23, 24, 25, 26, 27, 28, 29, 30, 43]

In [16]:
```python
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()
```

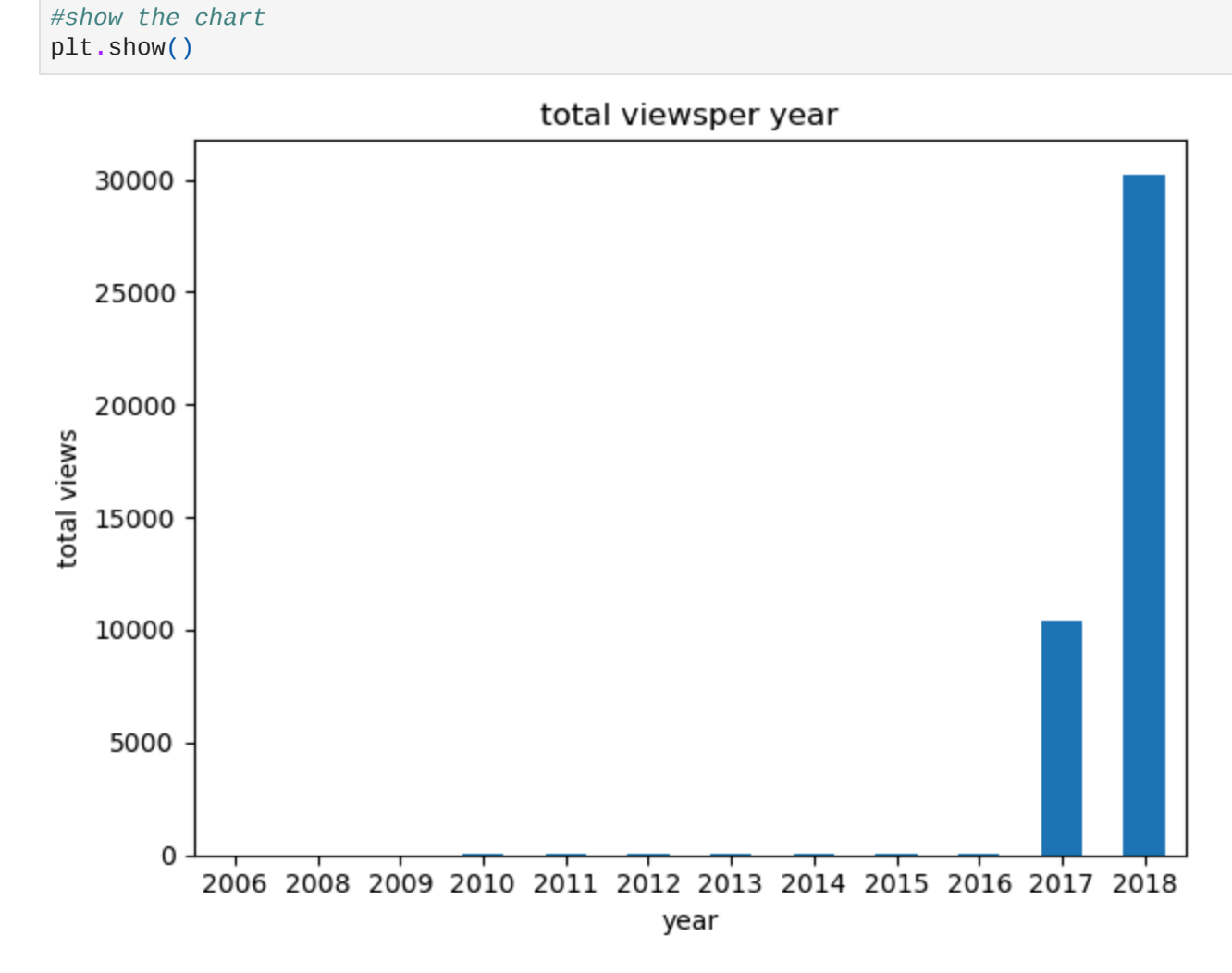
Out[16]:

	video_id	trending_date	title	channel_title	category_id	publish_time	tags	views	likes	dislikes	comment_count	comments_disabled	ratings_disabled
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	15954	False	False
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	12703	False	False
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	8181	False	False
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	2146	False	False
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	17518	False	False

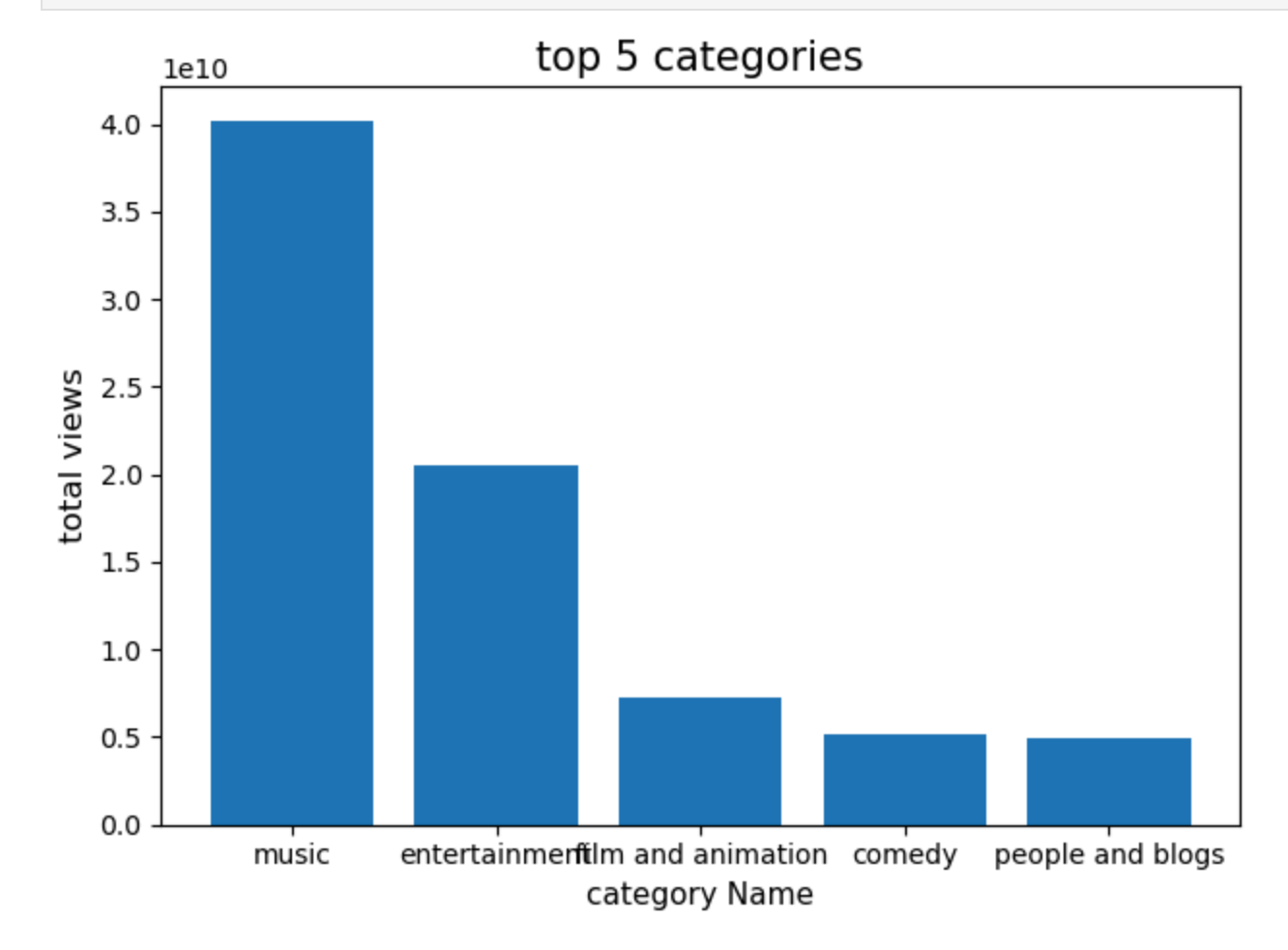
In [17]:
```python
df['year'] = df['publish_time'].dt.year
yearly_counts = df.groupby('year')['video_id'].count()

#create bar chart
yearly_counts.plot(kind='bar' , xlabel='year',ylabel='total publish count',title='total publish video per year')

#show the chart
plt.show()
```



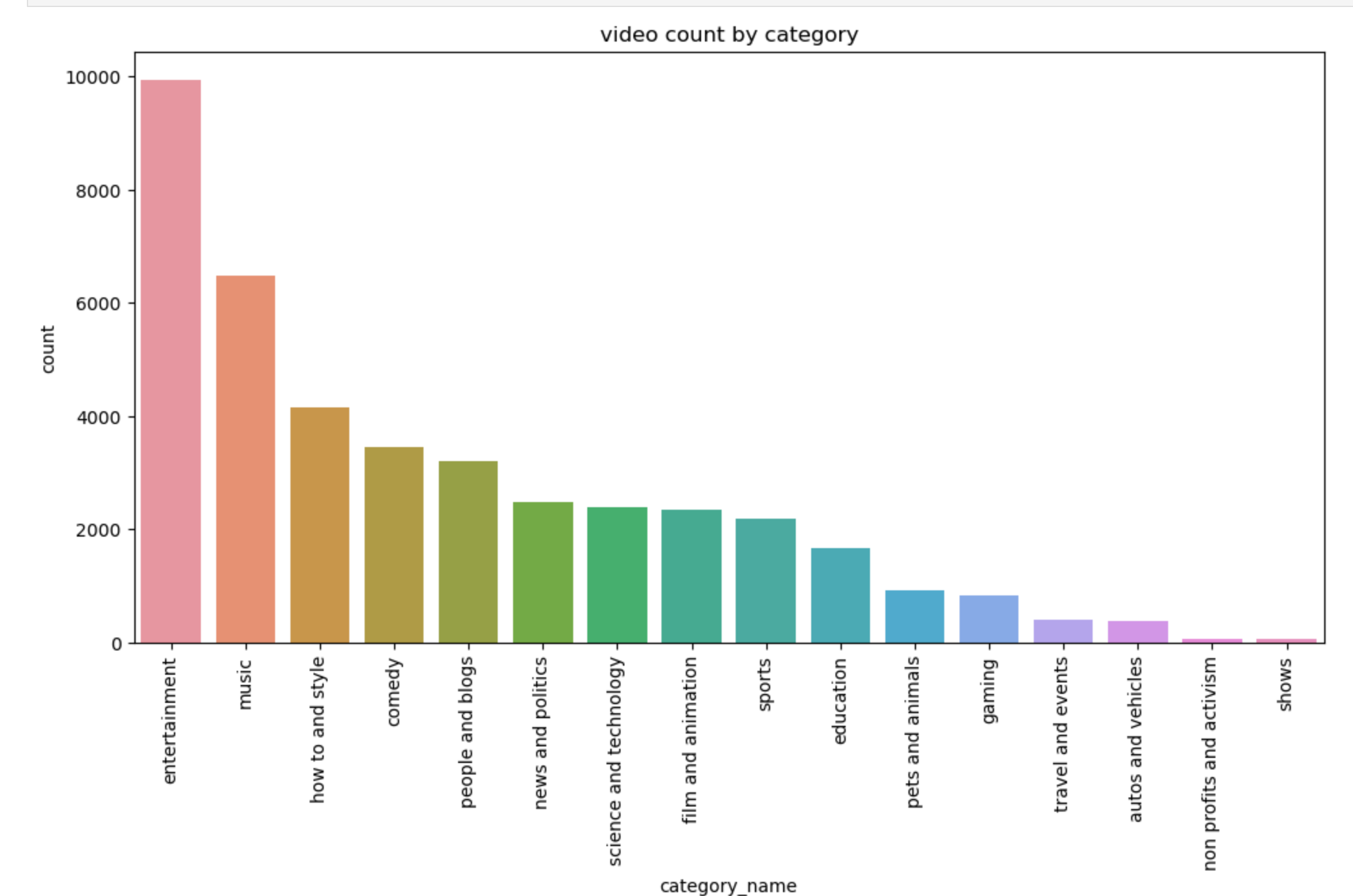
In [18]:
```python
yearly_views = df.groupby('year')['views'].sum

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

#show the chart
plt.show()
```



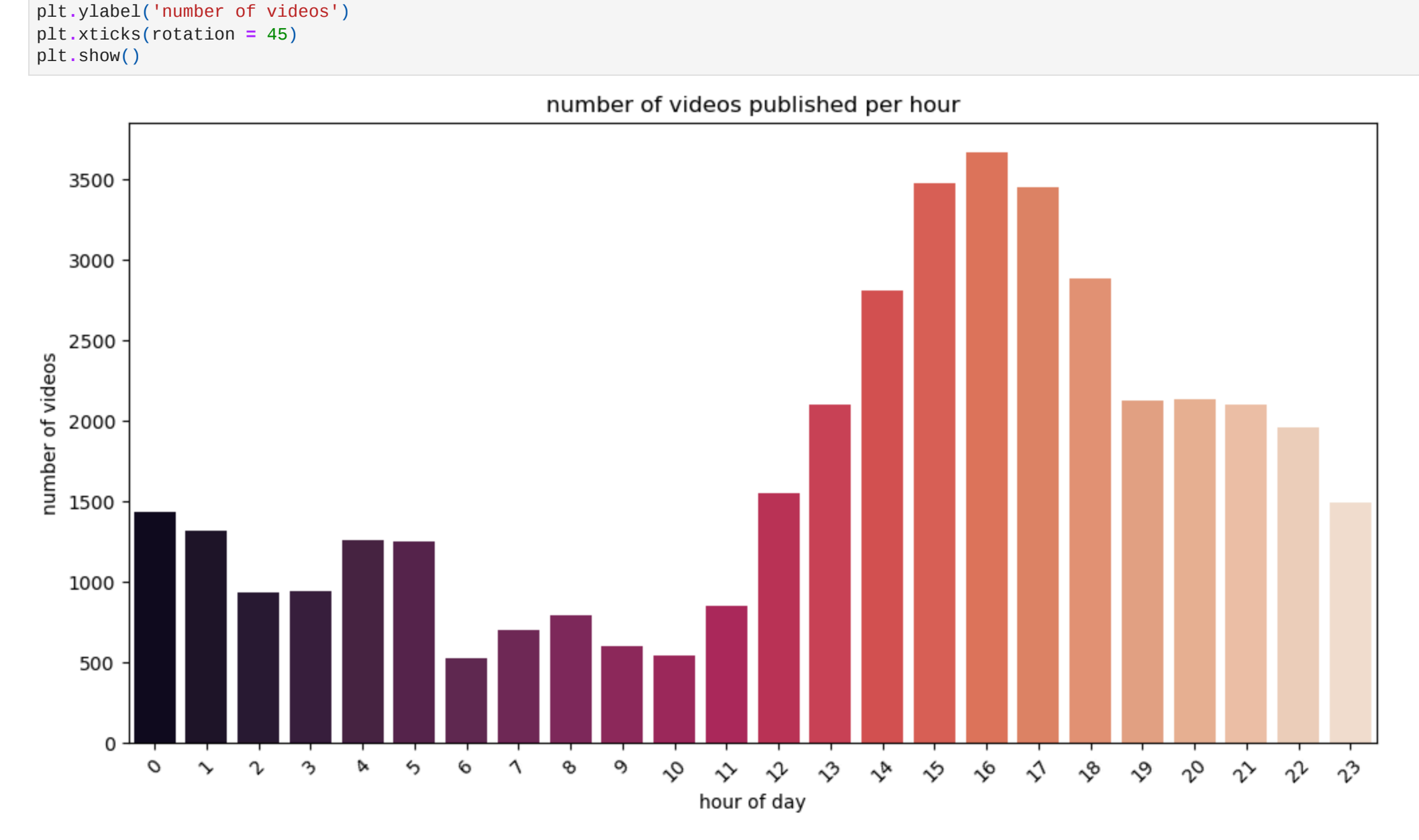
In [20]:
```python
category_views = df.groupby('category_name')['views'].sum().reset_index()

#start the categories by views in descending order
top_categories = category_views.sort_values(by = 'views' , ascending = False).head(5)

#create a bar plot to visualize the top 5 categories
plt.bar(top_categories['category_name'],top_categories['views'])
plt.xlabel('category Name',fontsize = 11)
plt.ylabel('total views',fontsize = 12)
plt.title('top 5 categories',fontsize = 15)
plt.tight_layout()
plt.show()
```



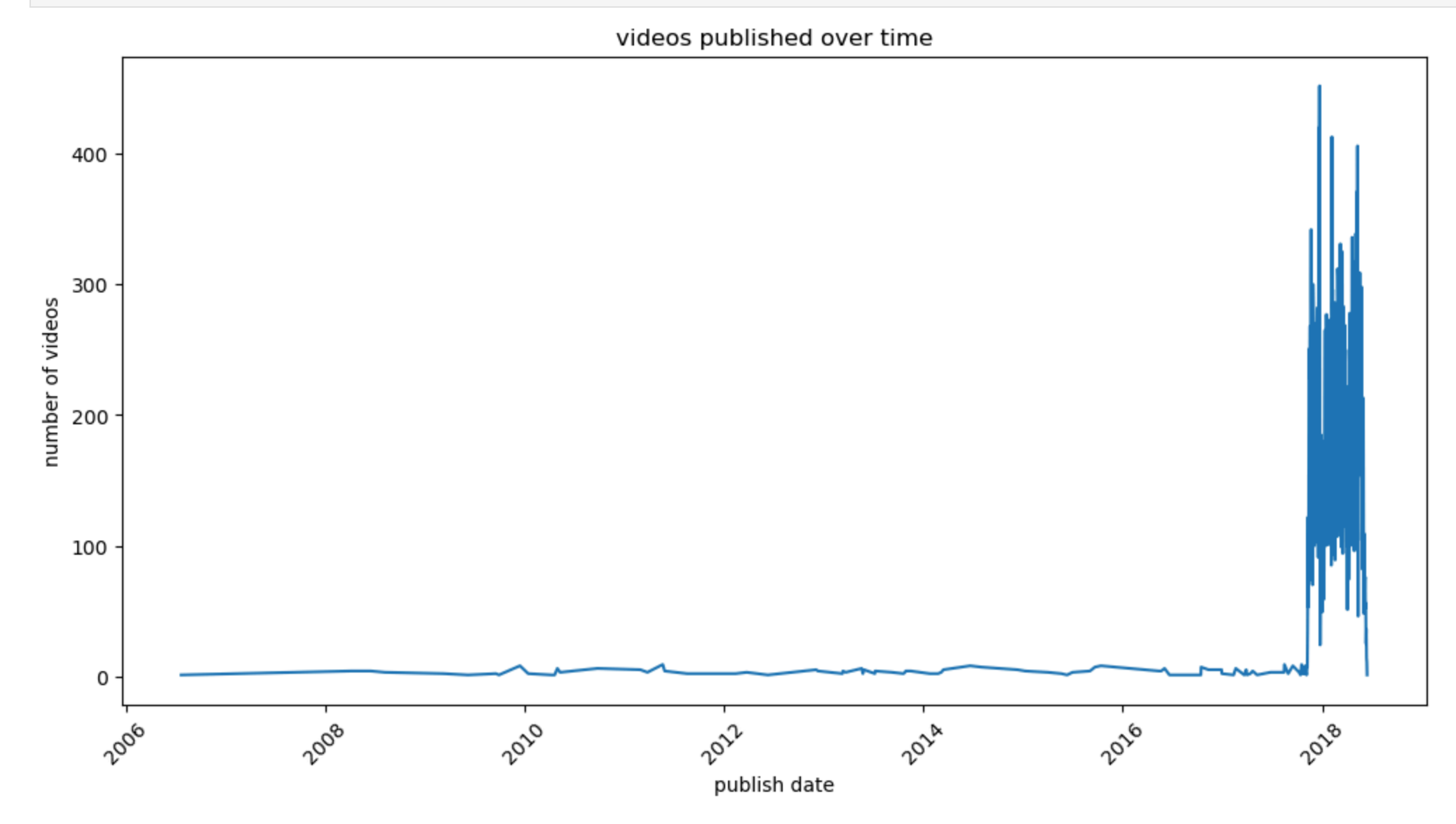
In [23]:
```python
plt.figure(figsize=(12, 6))
sns.countplot(x='category_name' , data=df, order=df['category_name'].value_counts().index)
plt.xticks(rotation = 90)
plt.title('video count by category')
plt.show()
```



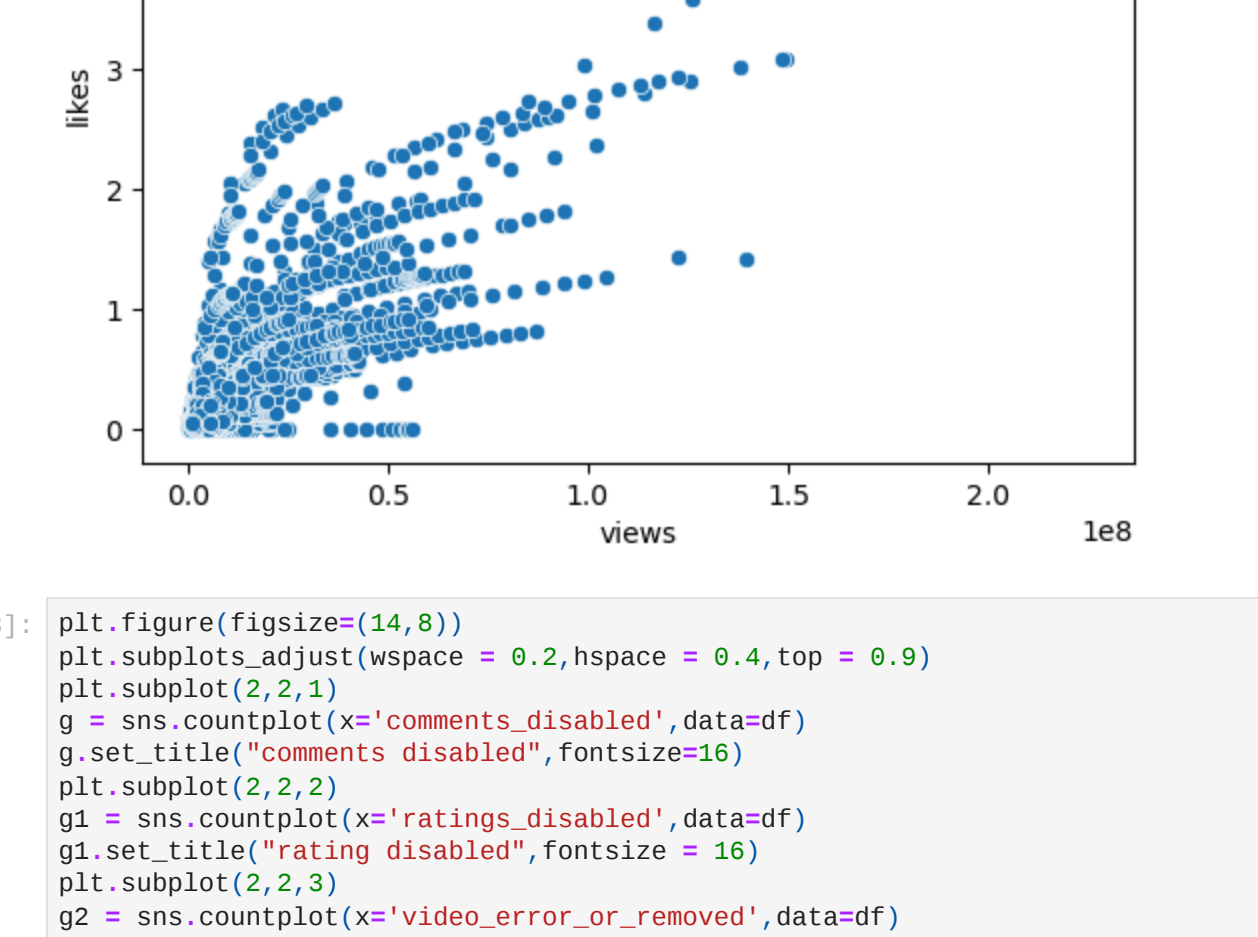
In [25]:
```python
#counting the number of videos published per hour
videos_per_hour = df['publish_hour'].value_counts().sort_index()

#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 videos published per hour')
plt.xlabel('hour of day')
plt.ylabel('number of videos')
plt.xticks(rotation = 45)
plt.show()
```



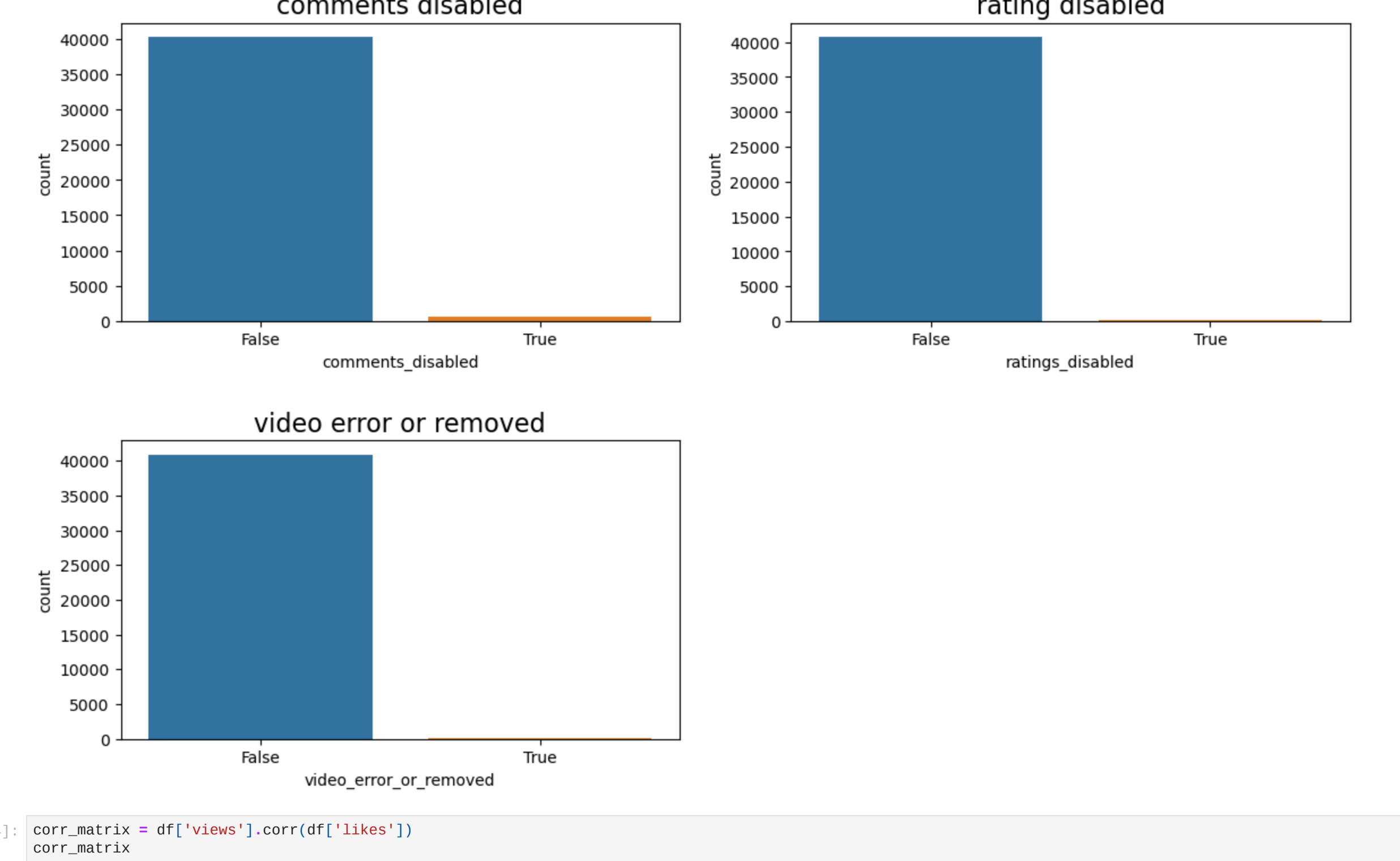
In [27]:
```python
df['publish_time'] = pd.to_datetime(df['publish_time'])
df['publish_date'] = df['publish_time'].dt.date
video_count_by_date = df.groupby('publish_date').size()
plt.figure(figsize = (12,6))
sns.lineplot(data=video_count_by_date)
plt.title("videos published over time")
plt.xlabel("publish date")
plt.ylabel("number of videos")
plt.xticks(rotation = 45)
plt.show()
```



In [28]:
```python
#scatter plot between 'views and likes'
sns.scatterplot(data=df,x='views',y='likes')
plt.title('views vs likes')
plt.xlabel('views')
plt.ylabel('likes')
plt.show()
```



In [33]:
```python
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 removed",fontsize = 16)
plt.show()
```



In [34]:
```python
corr_matrix = df['views'].corr(df['likes'])
corr_matrix
```

Out[34]: 0.8491785476230509

In [ ]: