In [1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from datetime import datetime
```

In [2]:
```
df = pd.read_csv('USvideos.csv')
```

In [3]:
```
df.head()
```

Out[3]:

	video_id	trending_date	title	channel_title	category_id	publish_time	tags	views	likes	dislikes	comment_count	thumbnail_link	comments_disabled	ratir
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	False	
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	False	
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	False	
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	False	
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	False	

In [4]:
```
df.shape
```

Out[4]: (40949, 16)

In [5]:
```
df = df.drop_duplicates()
df.shape
```

Out[5]: (40901, 16)

In [6]:
```
df.describe()
```

Out[6]:

	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 [7]:
```
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 [8]:
```
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 [9]:
```
from datetime import datetime
```

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

In [11]:
```
df["trending_date"] = df["trending_date"].apply(lambda x:datetime.datetime.strptime(x, '%y.%d.%m'))
df.head(3)
```

Out[11]:

	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	2017-11-13T17:13:01.000Z	SHANtell martin	748374	57527	2966	15954	False	False	False
1	1ZAPwfrtAFY	2017-11-14	The Trump Presidency: Last Week Tonight with J...	LastWeekTonight	24	2017-11-13T07:30:00.000Z	last week tonight trump presidency|"last week ...	2418783	97185	6146	12703	False	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	False

In [12]:
```
df['publish_time'] = pd.to_datetime(df['publish_time'])
df.head(2)
```

Out[12]:

	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 [13]:
```
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[13]:

	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	publish_month	publish_day	publish_hc
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	11	13	
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	11	13	

In [14]:
```
print (sorted(df["category_id"].unique()))
[1,2,10,15,17,19,20,222,23,24,25,26,27,28,29,30,43]
```

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

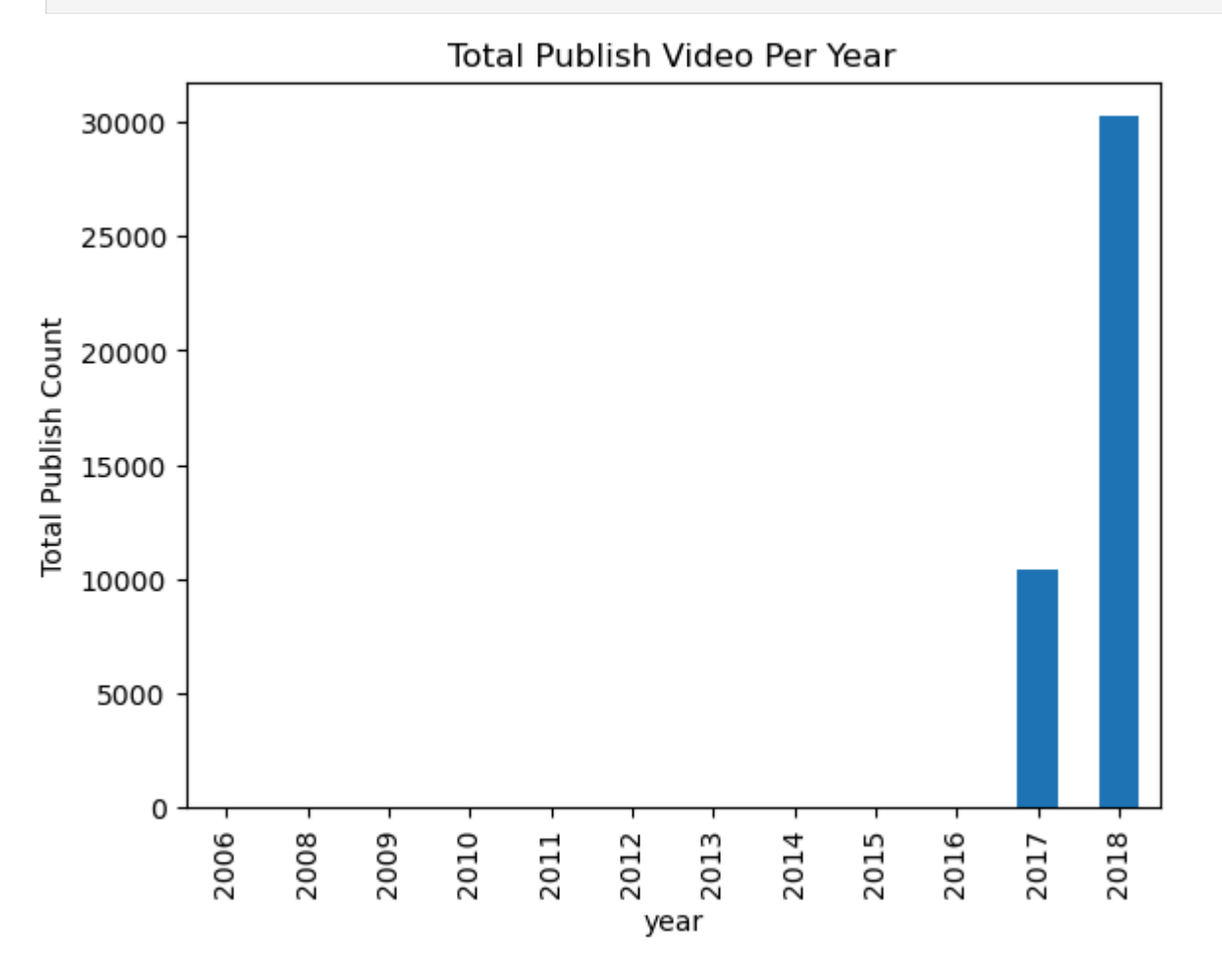
Out[14]: [1, 2, 10, 15, 17, 19, 20, 222, 23, 24, 25, 26, 27, 28, 29, 30, 43]

In [15]:
```
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()
```

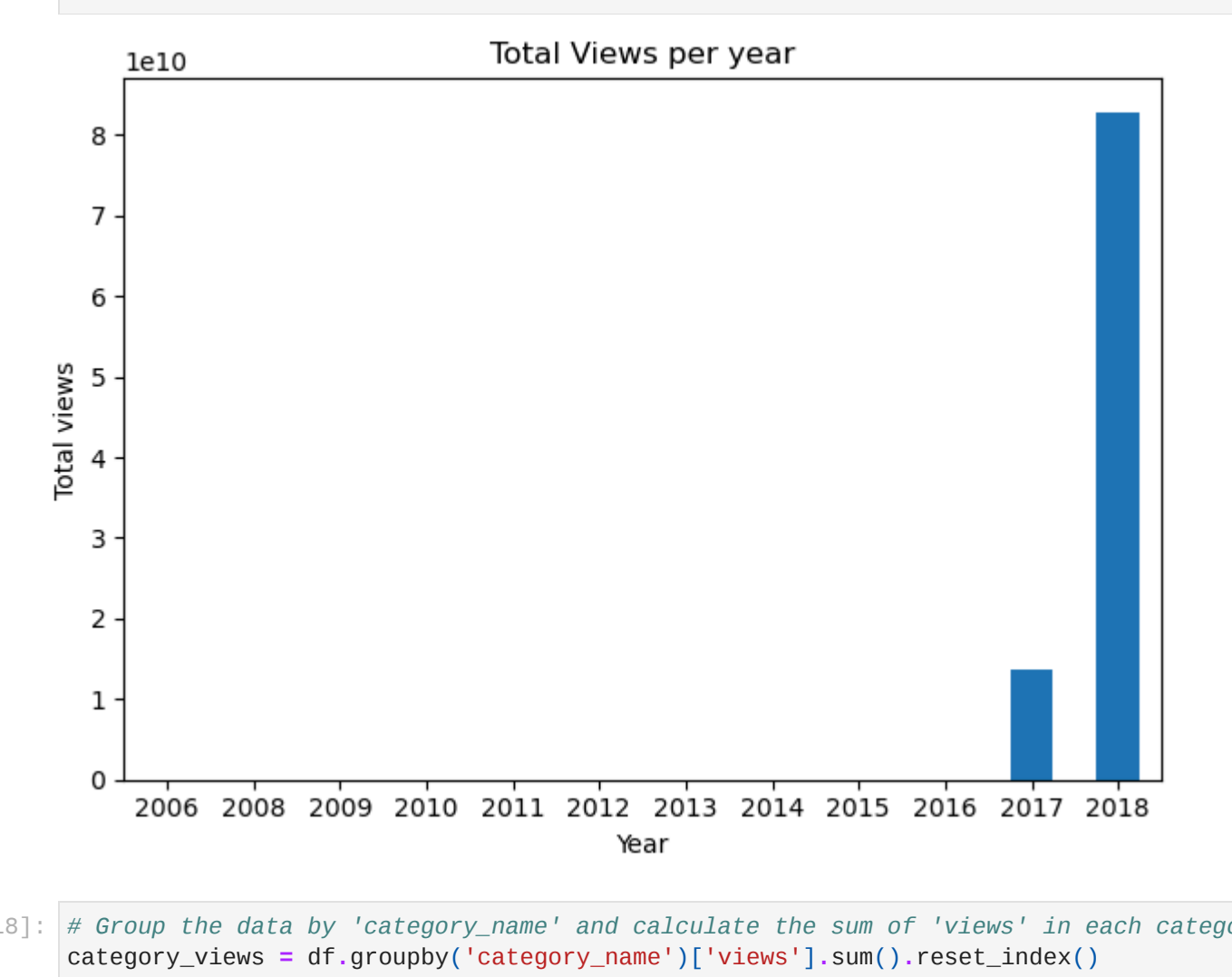
Out[15]:

	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	publish_mo
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	
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	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	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	False	

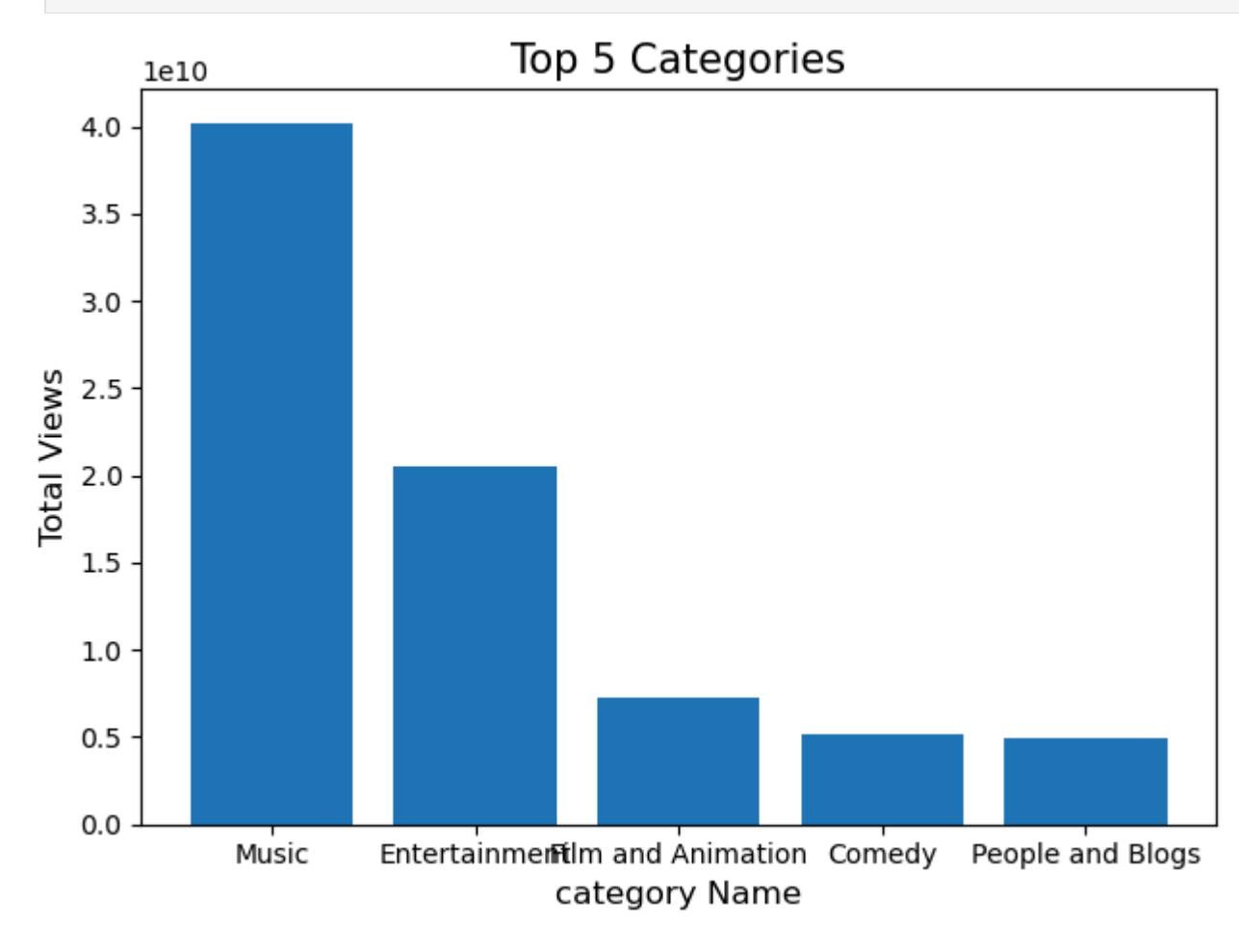
In [16]:
```
df['year'] = df['publish_time'].dt.year
yearly_counts = df.groupby('year')['video_id'].count()

# Create a bar chart
yearly_counts.plot(kind = 'bar' , xlabel = 'year', ylabel ='Total Publish Count', title = 'Total Publish Video Per Year')

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



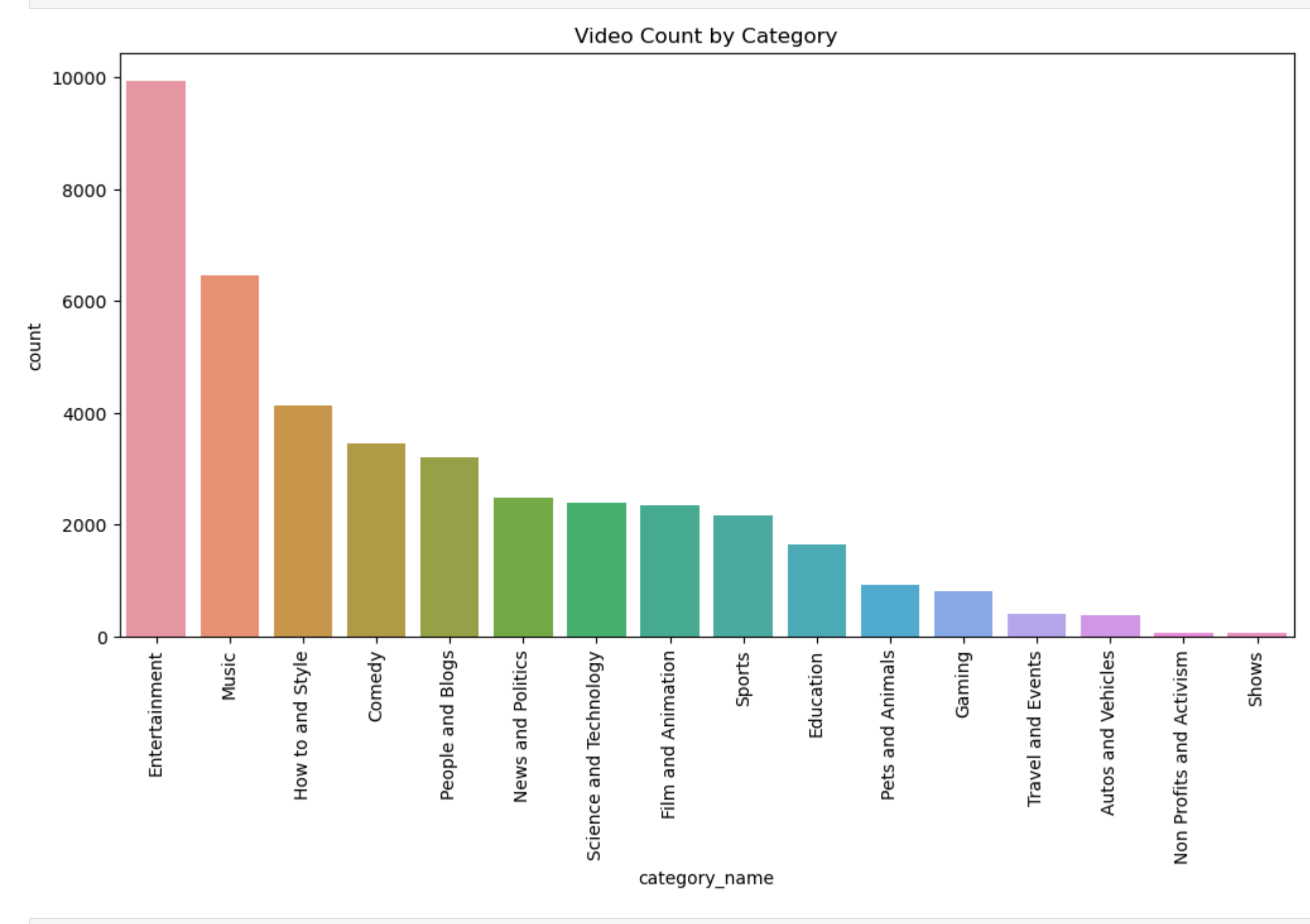
In [17]:
```
# Group by year and sum the views for each year
yearly_views = df.groupby ('year')['views'].sum()

# 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 chart
plt.show()
```



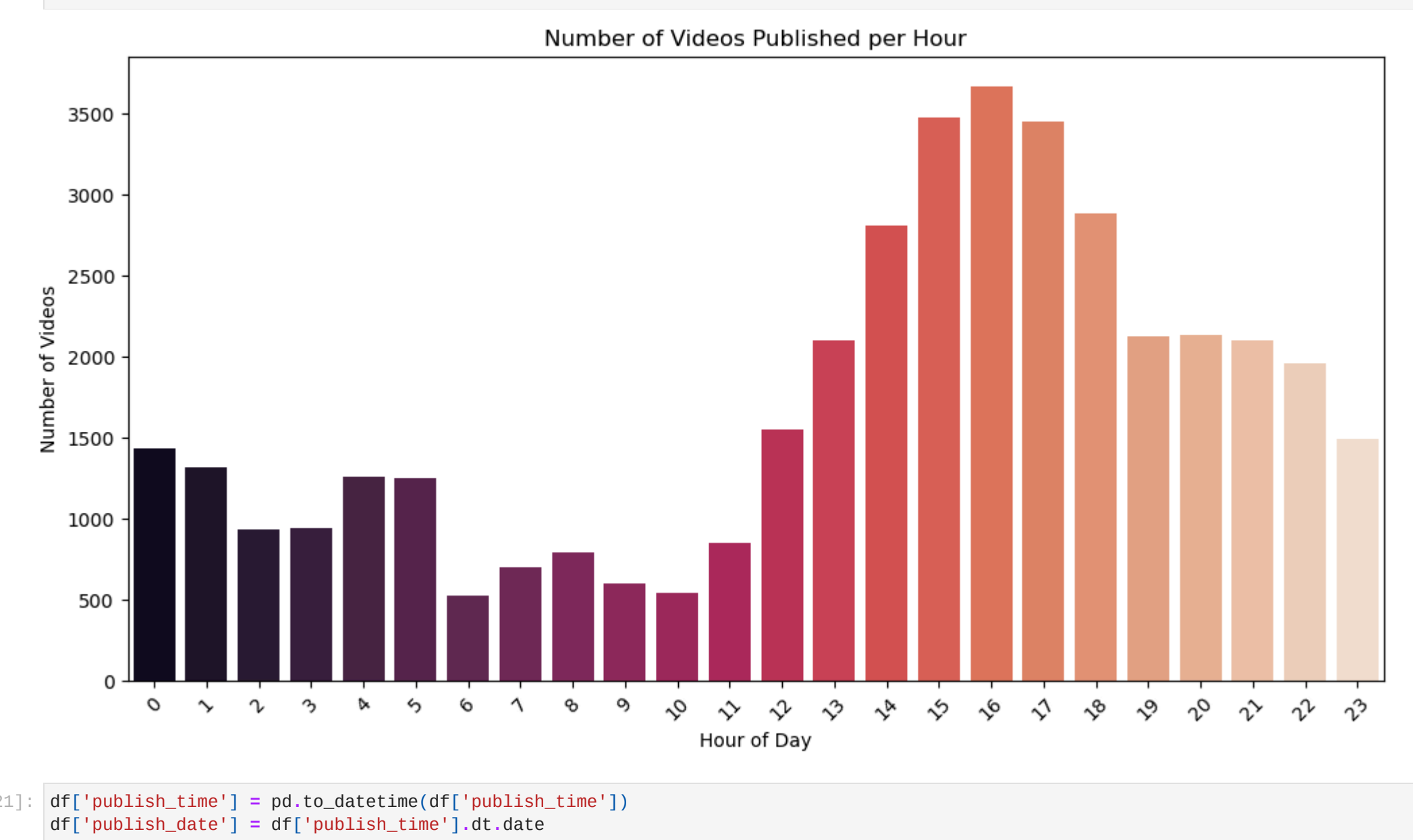
In [18]:
```
# Group the data by 'category_name' and calculate the sum of 'views' in each category
category_views = df.groupby('category_name')['views'].sum().reset_index()

# Sort 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 = 12)
plt.ylabel('Total Views',fontsize=12)
plt.title('Top 5 Categories',fontsize=15)
plt.tight_layout()
plt.show()
```



In [19]:
```
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()
```

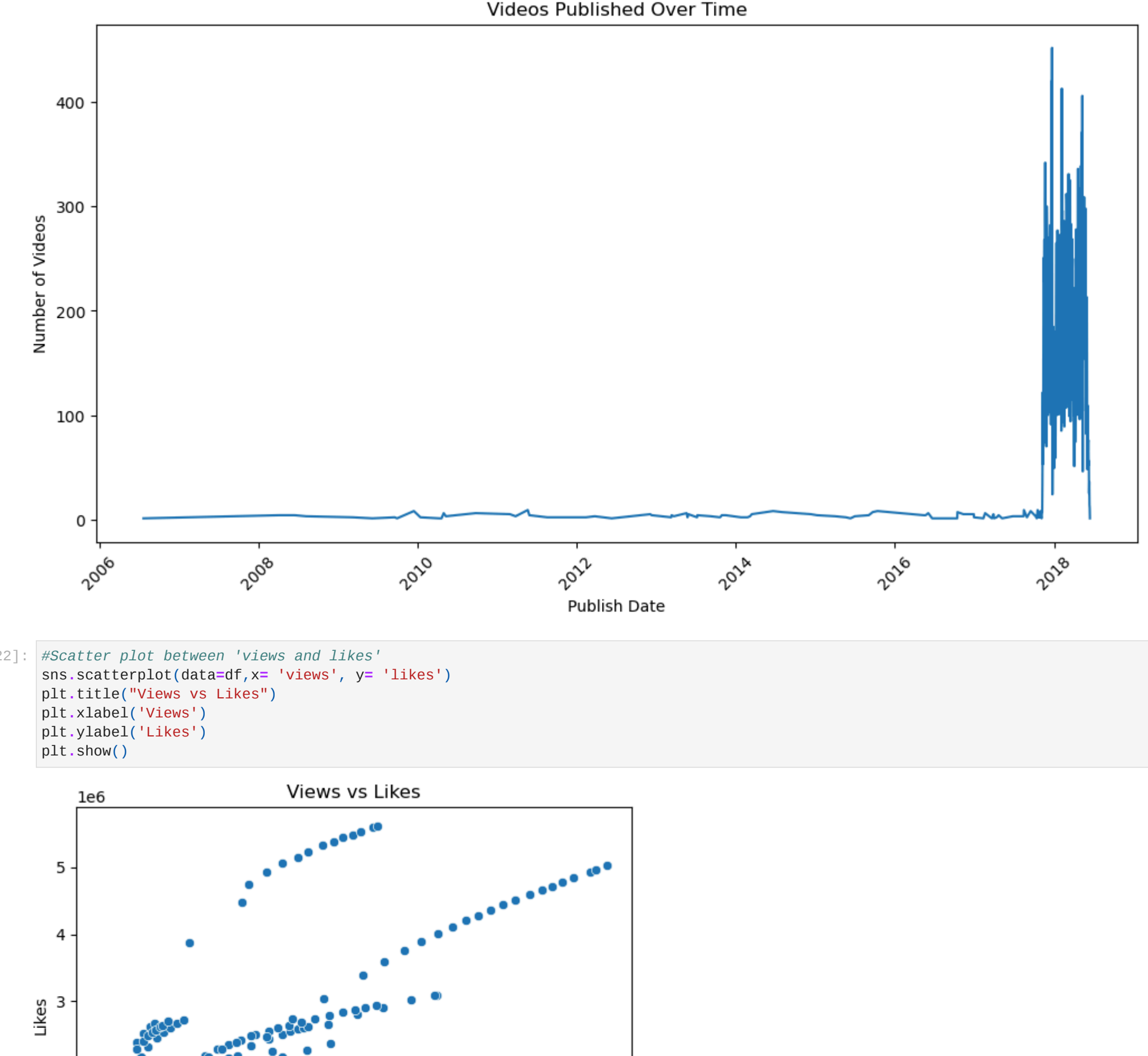


In [20]:
```
# Count the number of videos published per hour
videos_per_hour = df['publish_hour'].value_counts().sort_index()

# 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()
```

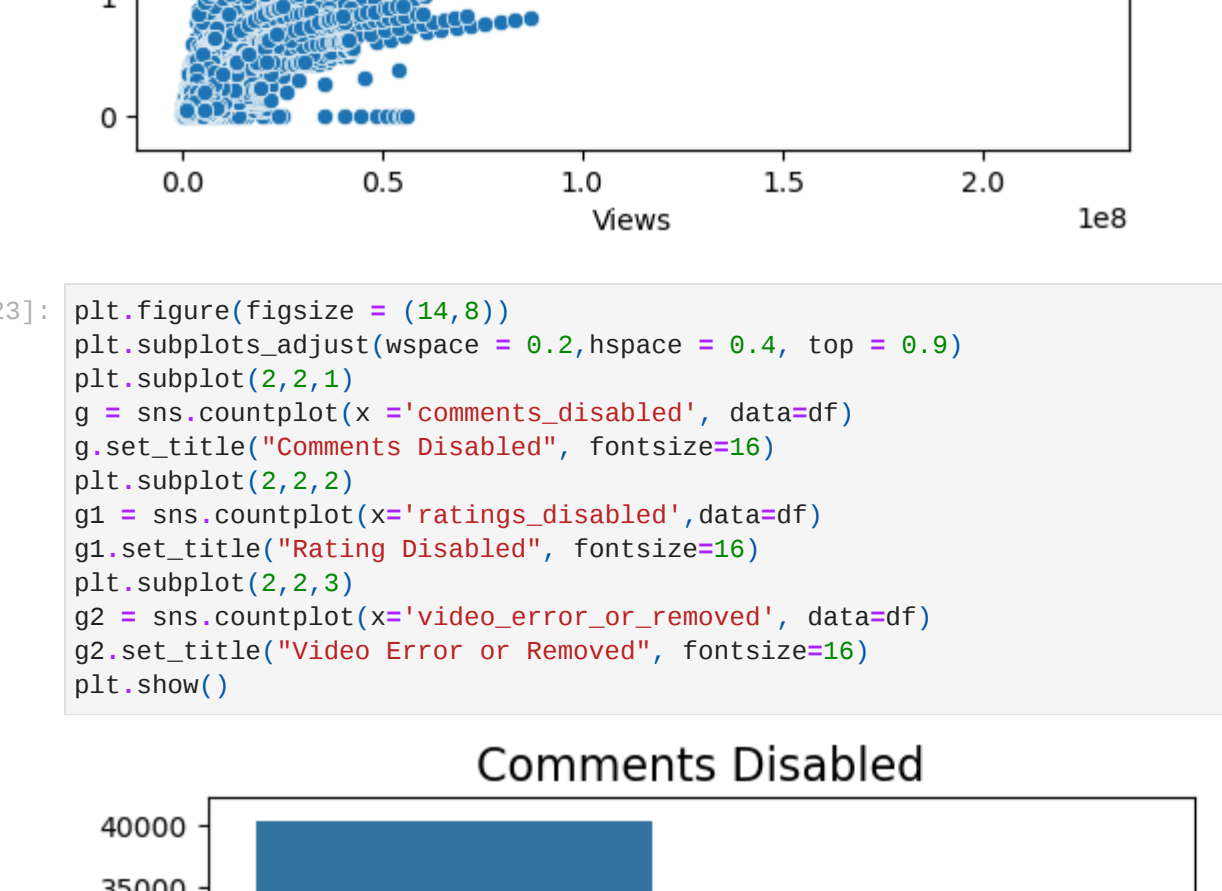


In [21]:
```
df['publish_time'] = pd.to_datetime(df['publish_time'])
df['publish_date'] = df['publish_time'].dt.date
video_count_by_date = df.groupby('publish_date').size()
plt.figure(figsize=(12,6))
sns.lineplot(data= video_count_by_date)
plt.title("Videos Published Over Time")
plt.xlabel('Publish Date')
plt.ylabel('Number of Videos')
plt.xticks(rotation = 45)
plt.show()
```

```
C:\Users\pc\anaconda3\New folder\Lib\site-packages\seaborn\_oldcore.py:1119: FutureWarning: use_inf_as_na option is deprecated and will be removed in a future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
C:\Users\pc\anaconda3\New folder\Lib\site-packages\seaborn\_oldcore.py:1119: FutureWarning: use_inf_as_na option is deprecated and will be removed in a future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
```



In [22]:
```
#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 [23]:
```
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 [24]:
```
corr_matrix = df['views'].corr(df['likes'])
corr_matrix
```

Out[24]: 0.8491785476230507