In [1]:
```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\\SURAJ SINGH\\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	comments_disabled	ratin
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 [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 [26]:
```python
import datetime
```

In [28]:
```python
df['publish_time'] = pd.to_datetime(df['publish_time'])
df.head(2)
```

Out[28]:

	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 [29]:
```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[29]:

	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_ho
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 [32]:
```python
print (sorted(df["category_id"].unique()))
[1, 2, 10, 15, 17, 19, 20, 22, 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(2
9), np.int64(43)]
```

Out[32]: [1, 2, 10, 15, 17, 19, 20, 22, 23, 24, 25, 26, 27, 28, 29, 30, 43]

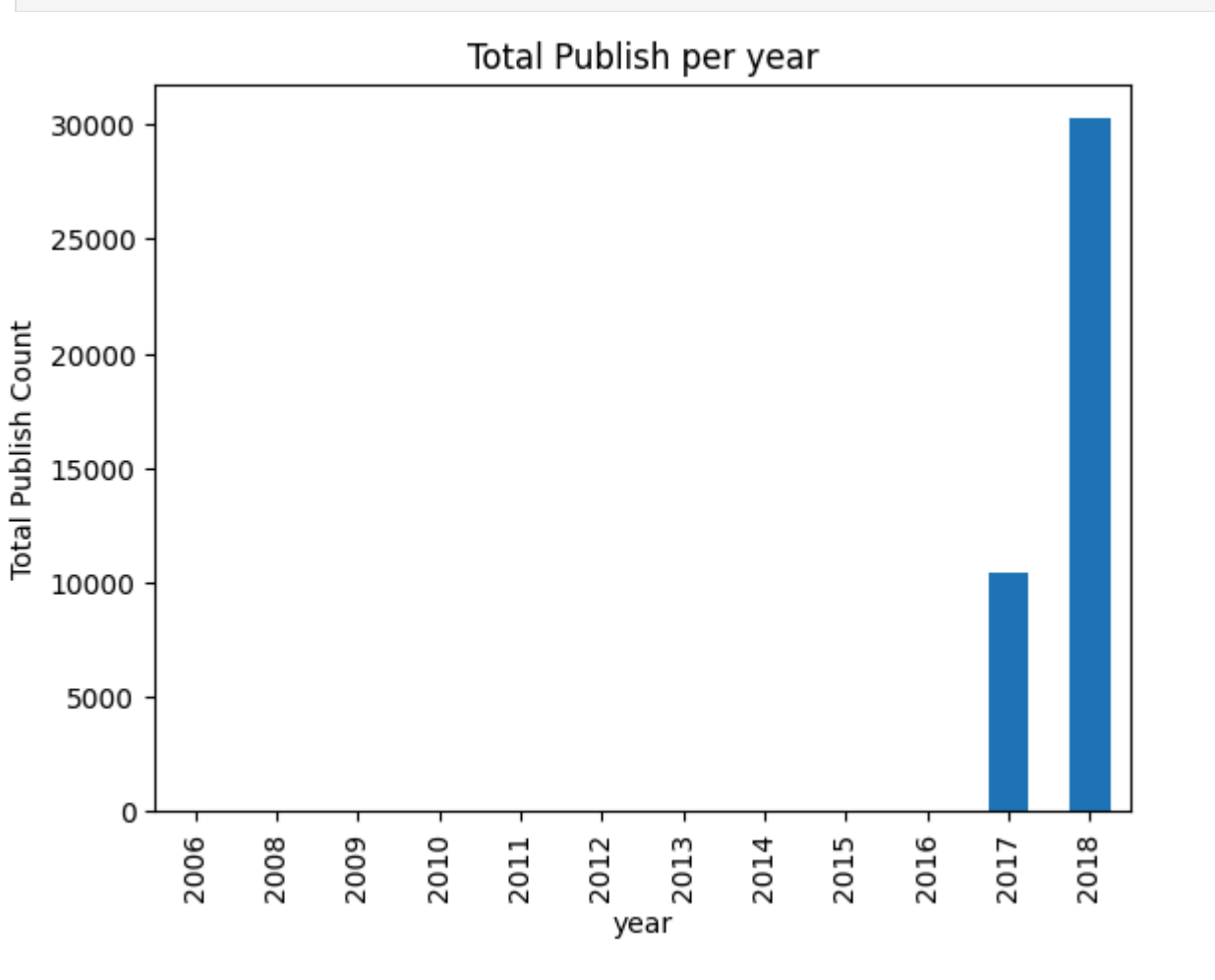
In [35]:
```python
df ['category_name'] = np.nan
df.loc[(df["category_id"] == 1), "category_name"] = "Film and Animation"
df.loc[(df["category_id"] == 2), "category_name"] = "Autos and Vehicles"
df.loc[(df["category_id"] == 10), "category_name"] = "Music"
df.loc[(df["category_id"] == 15), "category_name"] = "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 Technologies"
df.loc[(df["category_id"] == 29), "category_name"] = "Non Profit and Activism"
df.loc[(df["category_id"] == 30), "category_name"] = "Movies"
df.loc[(df["category_id"] == 43), "category_name"] = "Shows"
df.head()
```

```
C:\Users\SURAJ SINGH\AppData\Local\Temp\ipykernel_9784\978069342.py:2: FutureWarning: Setting an item of incompatible dtype is deprecated and will raise an error in a future version of pandas. Value 'Film a
nd 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"
```

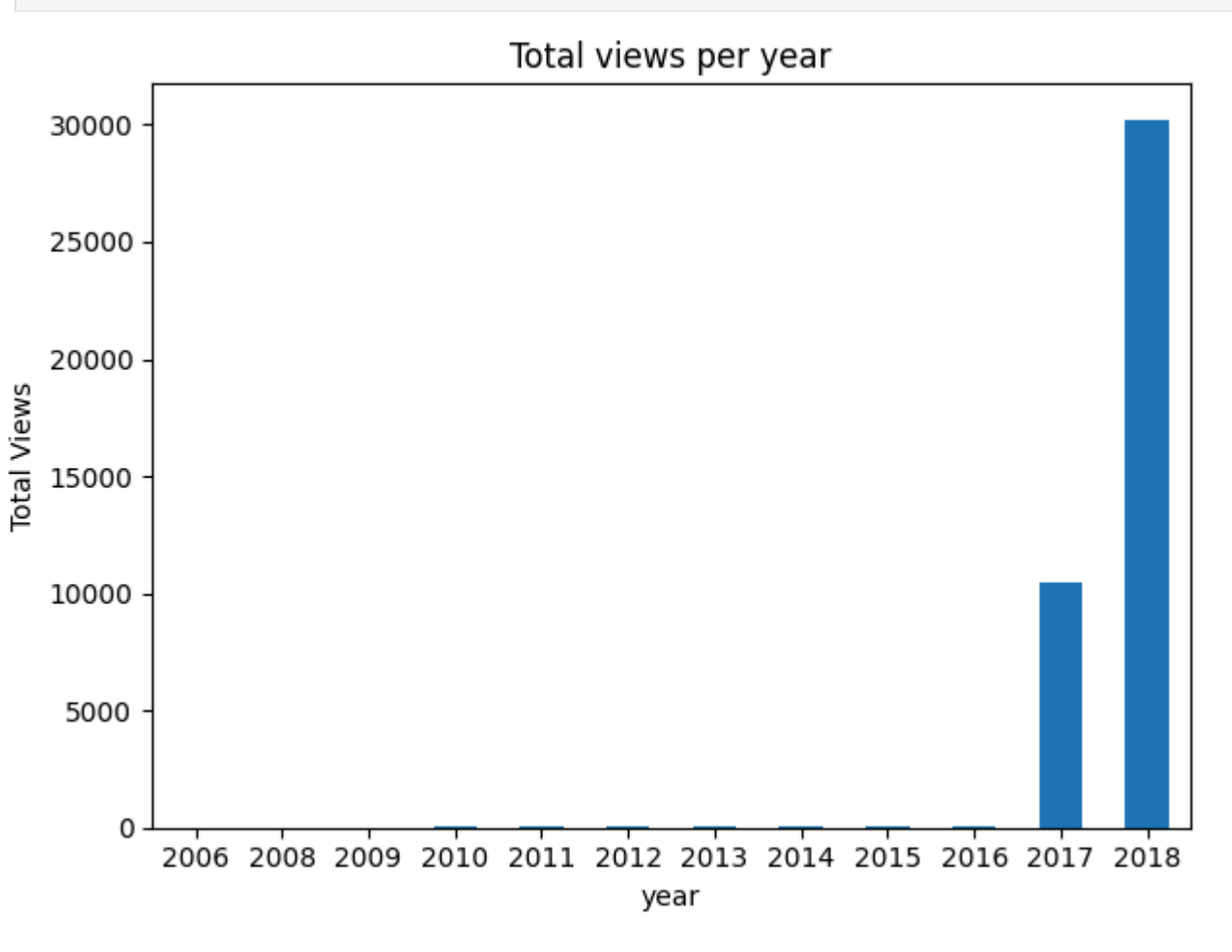
Out[35]:

	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	

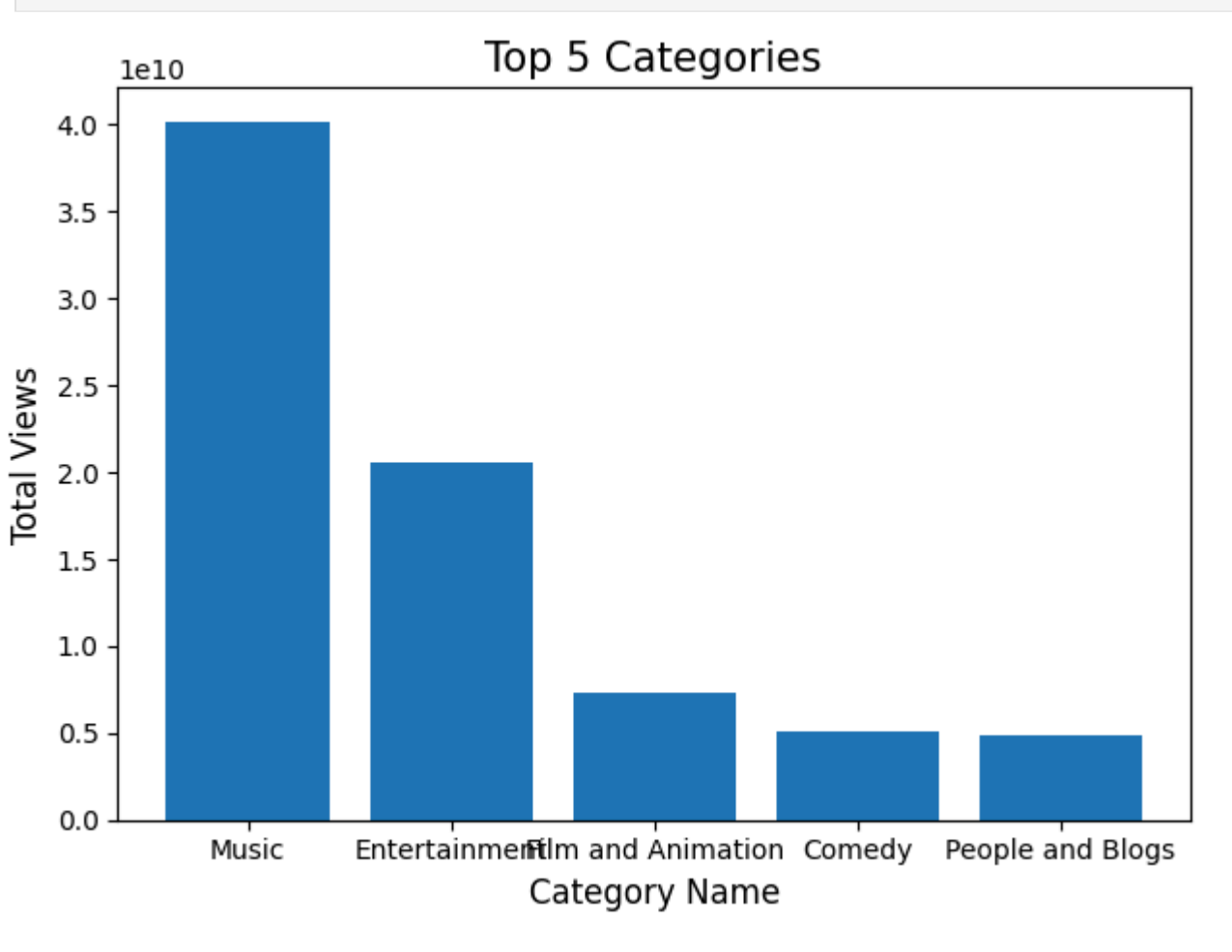
In [37]:
```python
df['year'] = df['publish_time'].dt.year
yearly_counts = df.groupby('year')['video_id'].count()

#create a bar chart
yearly_counts.plot(kind='bar', xlabel='year', ylabel='Total Publish Count', title='Total Publish per year')

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



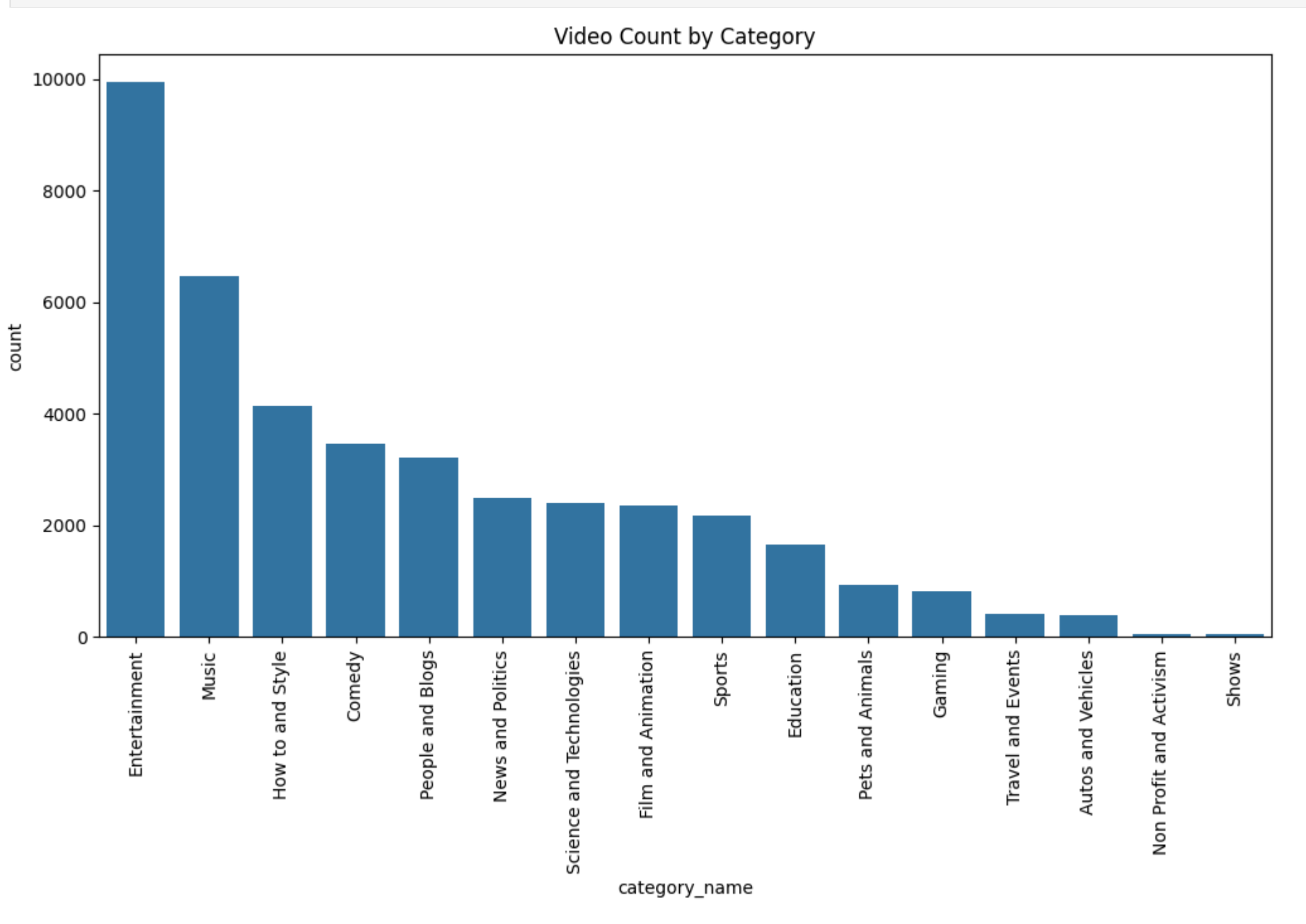
In [39]:
```python
#group by year and sum the views for each year
yearly_views = df.groupby('year')['views'].sum()

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

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



In [40]:
```python
# 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()
```

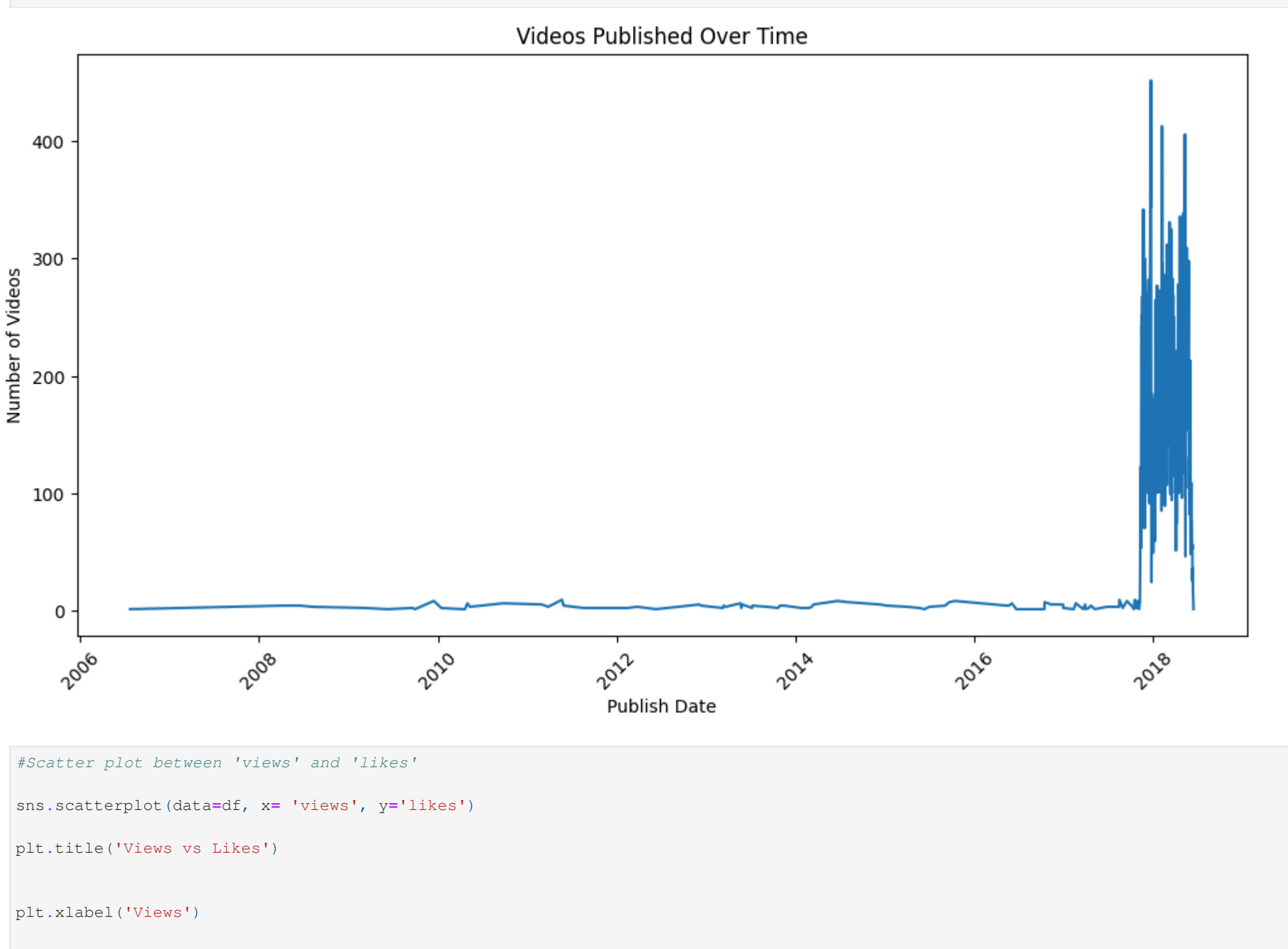


In [41]:
```python
plt.figure(figsize=(12, 6))

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()
```

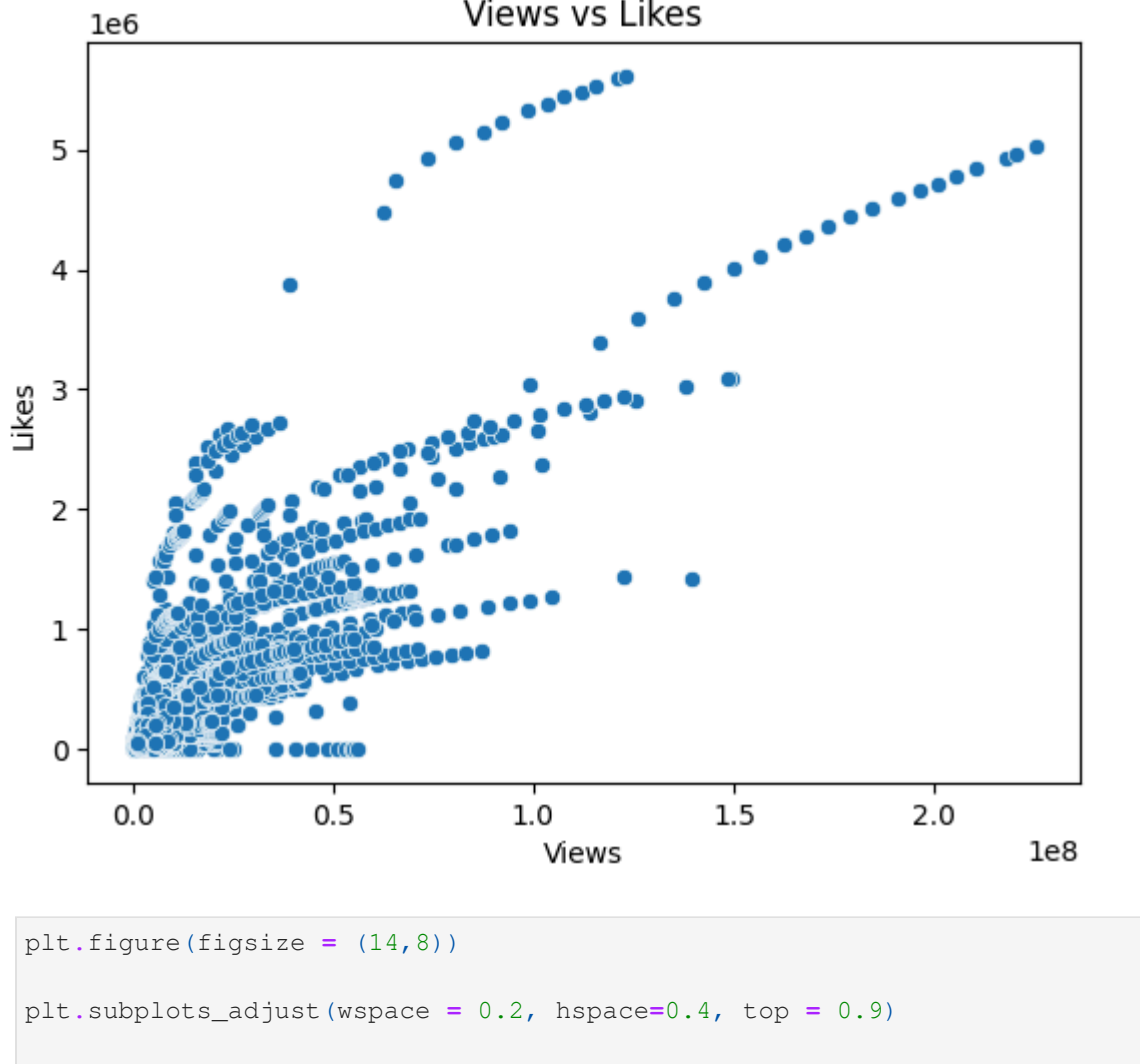


In [ ]:
```python
#Count the number of videos published per hour
videos_per_hour = df['publish_hour'].value_counts().sort_index()

#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 [44]:
```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 [45]:
```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 [48]:
```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 [49]:
```python
corr_matrix = df['views'].corr(df['likes'])
corr_matrix
```

Out[49]: np.float64(0.8491785476230503)

In [ ]: