# Data Analysis using Python-Task4

April 4, 2024

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

[2]:
```
df = pd.read_csv("C:\\Program Files\\PostgreSQL\\16\\data\\data_copy\\USvideos.
 ↪csv")
df.head()
```

[2]:
```
      video_id trending_date  \
0  2kyS6SvSYSE      17.14.11
1  1ZAPwfrtAFY      17.14.11
2  5qpjK5DgCt4      17.14.11
3  puqaWrEC7tY      17.14.11
4  d380meD0W0M      17.14.11

                                               title          channel_title  \
0                 WE WANT TO TALK ABOUT OUR MARRIAGE           CaseyNeistat
1  The Trump Presidency: Last Week Tonight with J…        LastWeekTonight
2  Racist Superman | Rudy Mancuso, King Bach & Le…           Rudy Mancuso
3                   Nickelback Lyrics: Real or Fake?  Good Mythical Morning
4                           I Dare You: GOING BALD!?               nigahiga

   category_id              publish_time  \
0           22  2017-11-13T17:13:01.000Z
1           24  2017-11-13T07:30:00.000Z
2           23  2017-11-12T19:05:24.000Z
3           24  2017-11-13T11:00:04.000Z
4           24  2017-11-12T18:01:41.000Z

                                                tags    views   likes  \
0                                    SHANtell martin   748374   57527
1  last week tonight trump presidency|"last week …  2418783   97185
2  racist superman|"rudy"|"mancuso"|"king"|"bach"…  3191434  146033
3  rhett and link|"gmm"|"good mythical morning"|"…   343168   10172
4  ryan|"higa"|"higatv"|"nigahiga"|"i dare you"|"…  2095731  132235
```

```
   dislikes  comment_count                                  thumbnail_link  \
0      2966          15954  https://i.ytimg.com/vi/2kyS6SvSYSE/default.jpg
1      6146          12703  https://i.ytimg.com/vi/1ZAPwfrtAFY/default.jpg
2      5339           8181  https://i.ytimg.com/vi/5qpjK5DgCt4/default.jpg
3       666           2146  https://i.ytimg.com/vi/puqaWrEC7tY/default.jpg
4      1989          17518  https://i.ytimg.com/vi/d380meD0W0M/default.jpg

   comments_disabled  ratings_disabled  video_error_or_removed  \
0              False             False                   False
1              False             False                   False
2              False             False                   False
3              False             False                   False
4              False             False                   False

                                         description
0  SHANTELL'S CHANNEL - https://www.youtube.com/s…
1  One year after the presidential election, John…
2  WATCH MY PREVIOUS VIDEO â-¶ \n\nSUBSCRIBE â-º …
3  Today we find out if Link is a Nickelback amat…
4  I know it's been a while since we did this sho…
```

```
[3]: df.shape
```

```
[3]: (40949, 16)
```

```
[4]: df = df.drop_duplicates()
     df.shape
```

```
[4]: (40901, 16)
```

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

```
[5]:        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
```

```
[6]: 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
```

[7]:

```
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
```

[8]:

```
from datetime import datetime
import datetime
```

[9]:

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

[9]:

```
      video_id trending_date  \
0  2kyS6SvSYSE    2017-11-14
1  1ZAPwfrtAFY    2017-11-14
2  5qpjK5DgCt4    2017-11-14

                                            title    channel_title  \
0                  WE WANT TO TALK ABOUT OUR MARRIAGE     CaseyNeistat
1  The Trump Presidency: Last Week Tonight with J…  LastWeekTonight
2  Racist Superman | Rudy Mancuso, King Bach & Le…     Rudy Mancuso

   category_id              publish_time  \
0           22  2017-11-13T17:13:01.000Z
1           24  2017-11-13T07:30:00.000Z
2           23  2017-11-12T19:05:24.000Z

                                             tags    views   likes  \
0                                  SHANtell martin   748374   57527
1  last week tonight trump presidency|"last week …  2418783   97185
2  racist superman|"rudy"|"mancuso"|"king"|"bach"…  3191434  146033

   dislikes  comment_count  comments_disabled  ratings_disabled  \
0      2966          15954              False             False
1      6146          12703              False             False
2      5339           8181              False             False

   video_error_or_removed
0                   False
1                   False
2                   False
```

[10]:

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

[10]:

```
      video_id trending_date  \
0  2kyS6SvSYSE    2017-11-14
1  1ZAPwfrtAFY    2017-11-14

                                            title    channel_title  \
0                  WE WANT TO TALK ABOUT OUR MARRIAGE     CaseyNeistat
1  The Trump Presidency: Last Week Tonight with J…  LastWeekTonight

   category_id              publish_time  \
0           22 2017-11-13 17:13:01+00:00
```

```
1           24 2017-11-13 07:30:00+00:00

                                                   tags    views  likes  \
0                                        SHANtell martin   748374  57527
1  last week tonight trump presidency|"last week …  2418783  97185

   dislikes  comment_count  comments_disabled  ratings_disabled  \
0      2966          15954              False             False
1      6146          12703              False             False

   video_error_or_removed
0                   False
1                   False
```

[11]:
```
df['publish_month'] = df['publish_time'].dt.month
df['publish_day'] = df['publish_time'].dt.day
df['publish_year'] = df['publish_time'].dt.year
df.head(2)
```

[11]:
```
      video_id trending_date  \
0  2kyS6SvSYSE      2017-11-14
1  1ZAPwfrtAFY      2017-11-14

                                                 title    channel_title  \
0                   WE WANT TO TALK ABOUT OUR MARRIAGE     CaseyNeistat
1  The Trump Presidency: Last Week Tonight with J…  LastWeekTonight

   category_id              publish_time  \
0           22 2017-11-13 17:13:01+00:00
1           24 2017-11-13 07:30:00+00:00

                                                   tags    views  likes  \
0                                        SHANtell martin   748374  57527
1  last week tonight trump presidency|"last week …  2418783  97185

   dislikes  comment_count  comments_disabled  ratings_disabled  \
0      2966          15954              False             False
1      6146          12703              False             False

   video_error_or_removed  publish_month  publish_day  publish_year
0                   False             11           13          2017
1                   False             11           13          2017
```

[12]:
```
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]
```

```
[12]: [1, 2, 10, 15, 17, 19, 20, 22, 23, 24, 25, 26, 27, 28, 29, 30, 43]
```

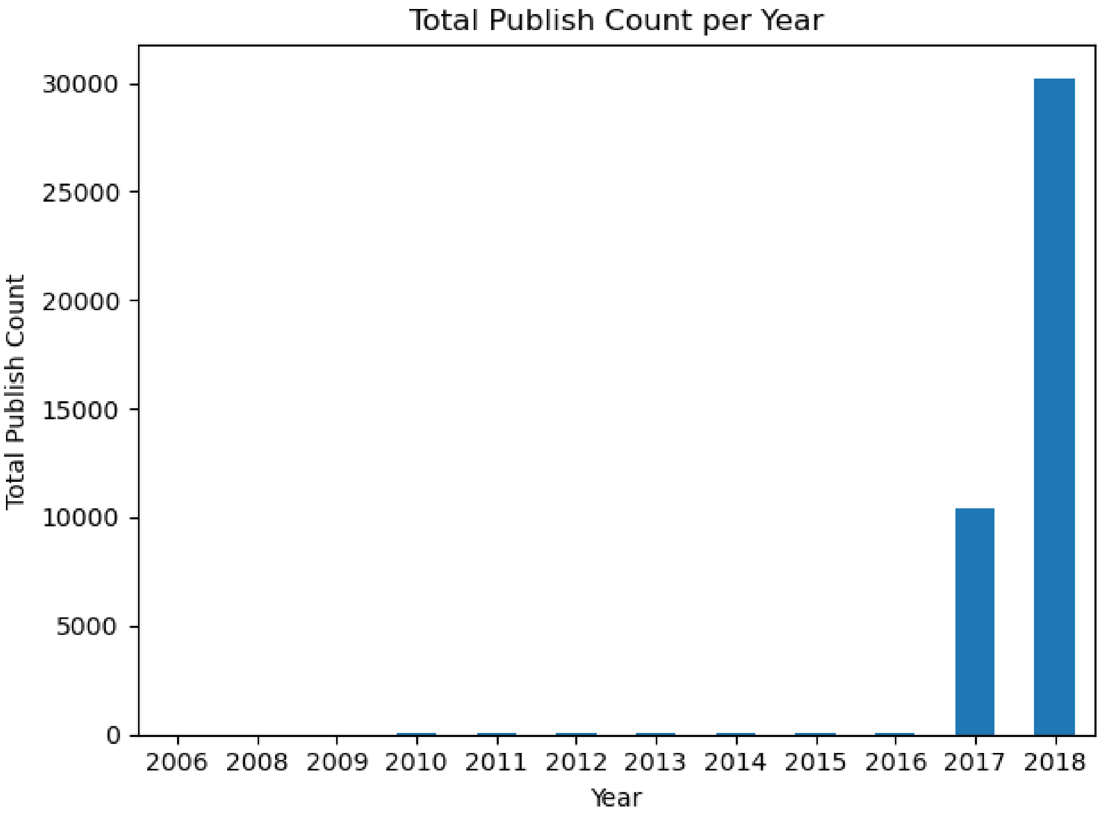
```
[13]: df["category_name"] = np.nan
df.loc[(df["category_id"] == 1), "category_name"] = 'film and Animation'
df.loc[(df["category_id"] == 2), "category_name"] = 'Autos and Vehicles'
df.loc[(df["category_id"] == 10), "category_name"] = 'Music'
df.loc[(df["category_id"] == 15), "category_name"] = 'Pets 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-Profit and Activise'
df.loc[(df["category_id"] == 30), "category_name"] = 'Movies'
df.loc[(df["category_id"] == 43), "category_name"] = 'Shows'
df.head()
```

```
[13]:       video_id trending_date  \
0  2kyS6SvSYSE    2017-11-14
1  1ZAPwfrtAFY    2017-11-14
2  5qpjK5DgCt4    2017-11-14
3  puqaWrEC7tY    2017-11-14
4  d380meD0W0M    2017-11-14

                                               title          channel_title  \
0                 WE WANT TO TALK ABOUT OUR MARRIAGE           CaseyNeistat
1  The Trump Presidency: Last Week Tonight with J…        LastWeekTonight
2  Racist Superman | Rudy Mancuso, King Bach & Le…           Rudy Mancuso
3                   Nickelback Lyrics: Real or Fake?  Good Mythical Morning
4                           I Dare You: GOING BALD!?               nigahiga

   category_id              publish_time  \
0           22 2017-11-13 17:13:01+00:00
1           24 2017-11-13 07:30:00+00:00
2           23 2017-11-12 19:05:24+00:00
3           24 2017-11-13 11:00:04+00:00
4           24 2017-11-12 18:01:41+00:00

                                                tags    views   likes  \
0                                    SHANtell martin   748374   57527
1  last week tonight trump presidency|"last week …  2418783   97185
2  racist superman|"rudy"|"mancuso"|"king"|"bach"…  3191434  146033
```

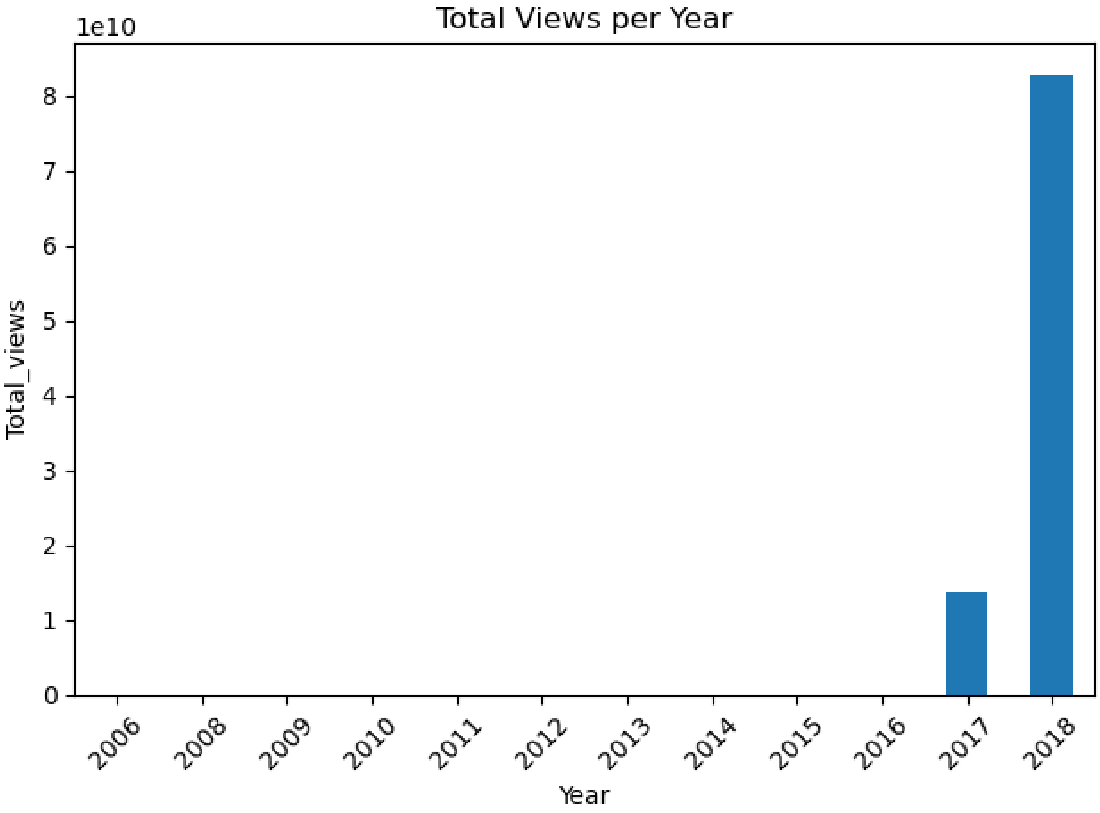
```
3  rhett and link|"gmm"|"good mythical morning"|"…   343168   10172
4  ryan|"higa"|"higatv"|"nigahiga"|"i dare you"|"…  2095731  132235

   dislikes  comment_count  comments_disabled  ratings_disabled  \
0      2966          15954              False             False
1      6146          12703              False             False
2      5339           8181              False             False
3       666           2146              False             False
4      1989          17518              False             False

   video_error_or_removed  publish_month  publish_day  publish_year  \
0                   False             11           13          2017
1                   False             11           13          2017
2                   False             11           12          2017
3                   False             11           13          2017
4                   False             11           12          2017

     category_name
0  People and Blogs
1     Entertainment
2            Comedy
3     Entertainment
4     Entertainment
```

[15]:

```
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 Count per Year')
plt.xticks(rotation = 0)
plt.tight_layout()
# show a bar chart
plt.show()
```

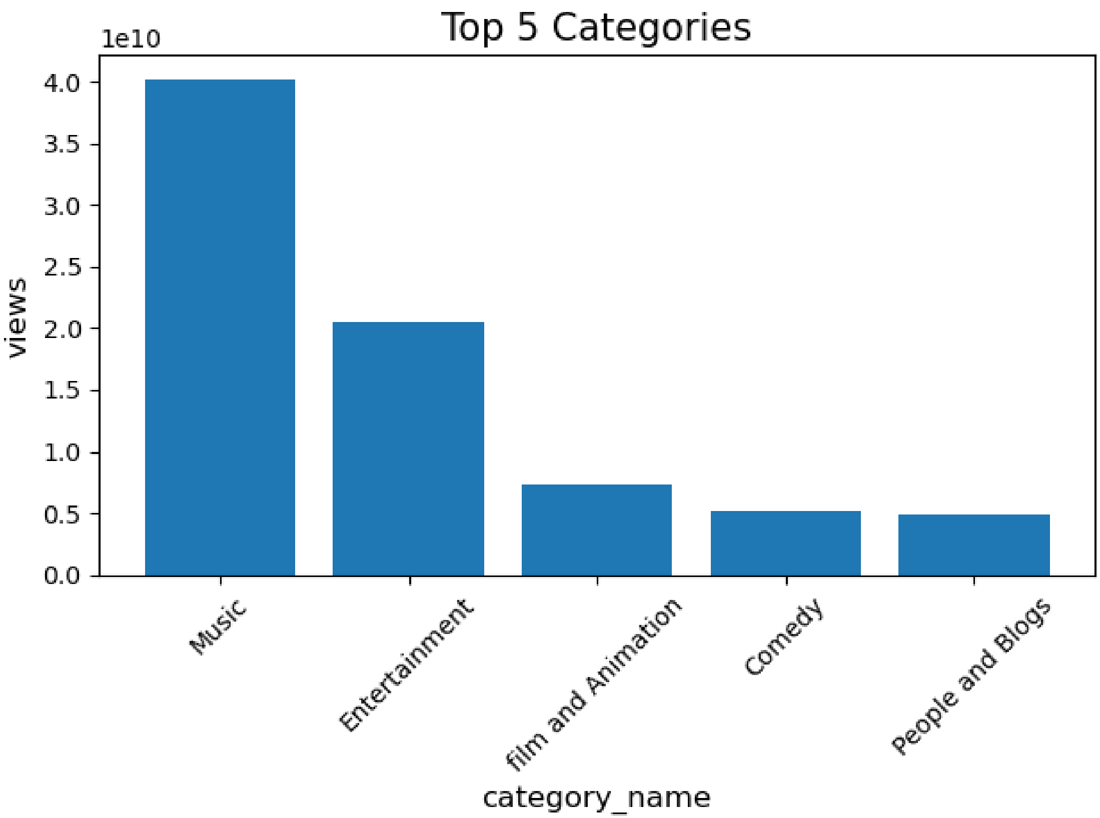


[16]:
```
# Group by year and sum of views for each year
yearly_views = df.groupby('year')['views'].sum()
# Create a bar plot
yearly_views.plot(kind = 'bar', xlabel = 'Year', ylabel = 'Total_views', title␣
  ↪= 'Total Views per Year')
plt.xticks(rotation = 45)
plt.tight_layout()
# Create a bar chart
plt.show()
```

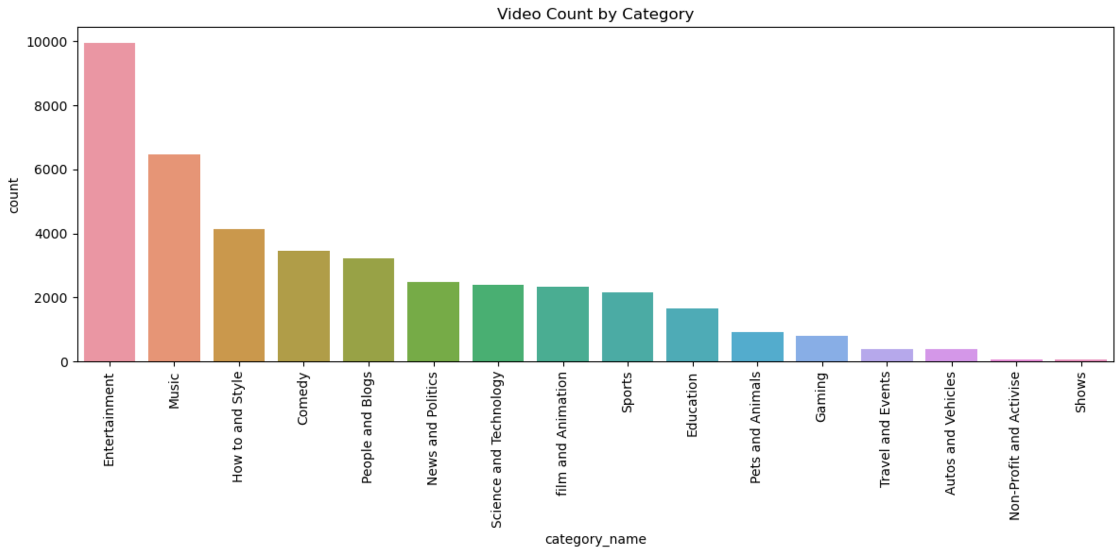


[17]:

```
# 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('views', fontsize = 12)
plt.title('Top 5 Categories', fontsize = 15)
plt.xticks(rotation = 45)
plt.tight_layout()
# Create a bar chart
plt.show()
```

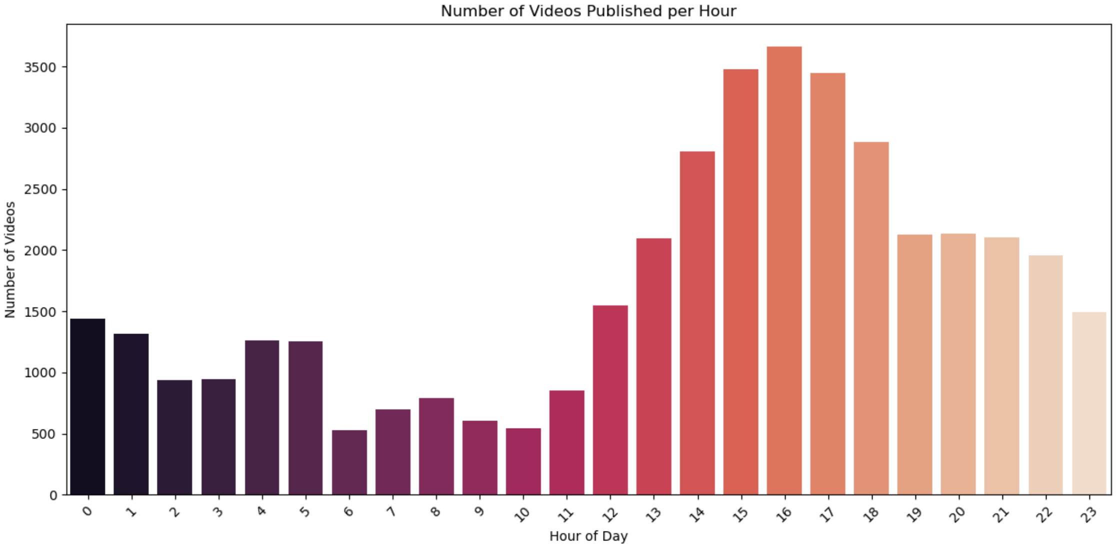


[18]:
```
plt.figure(figsize = (12,6))
sns.countplot(x = 'category_name', data = df, order = df['category_name'].
 ↪value_counts().index)
plt.title('Video Count by Category')
plt.xticks(rotation = 90)
plt.tight_layout()
plt.show()
```

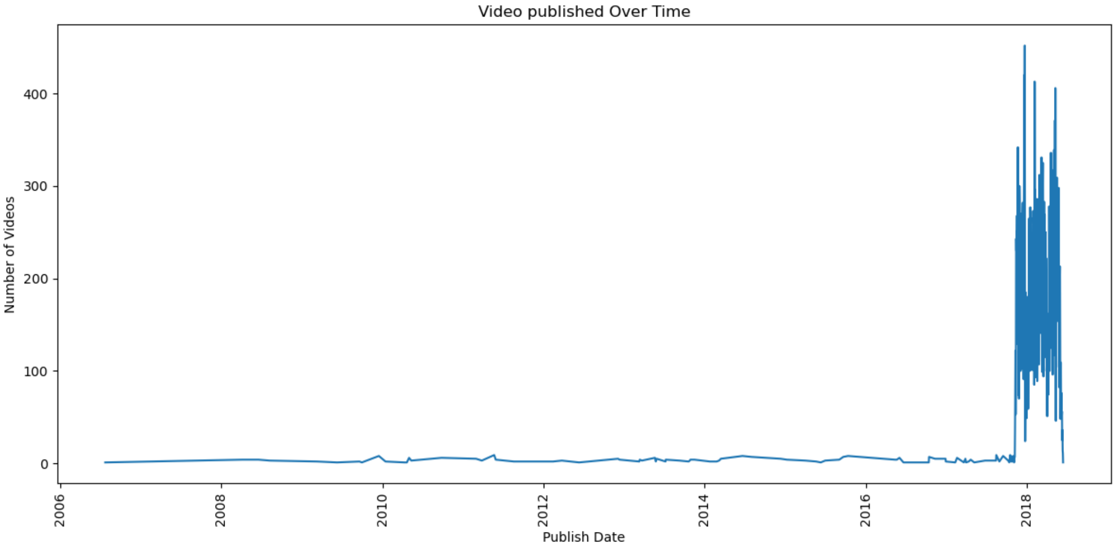


[19]:

```
# Count the number of video publish per hour
df['publish_time'] = pd.to_datetime(df['publish_time'])
df['publish_hour'] = df['publish_time'].dt.hour
video_per_hour = df['publish_hour'].value_counts().sort_index()
# Create a bar plot
plt.figure(figsize = (12,6))
sns.barplot(x = video_per_hour.index, y = video_per_hour.values, palette =␣
  ↪'rocket')
plt.xlabel('Hour of Day')
plt.ylabel('Number of Videos')
plt.title('Number of Videos Published per Hour')
plt.xticks(rotation = 45)
plt.tight_layout()
plt.show()
```

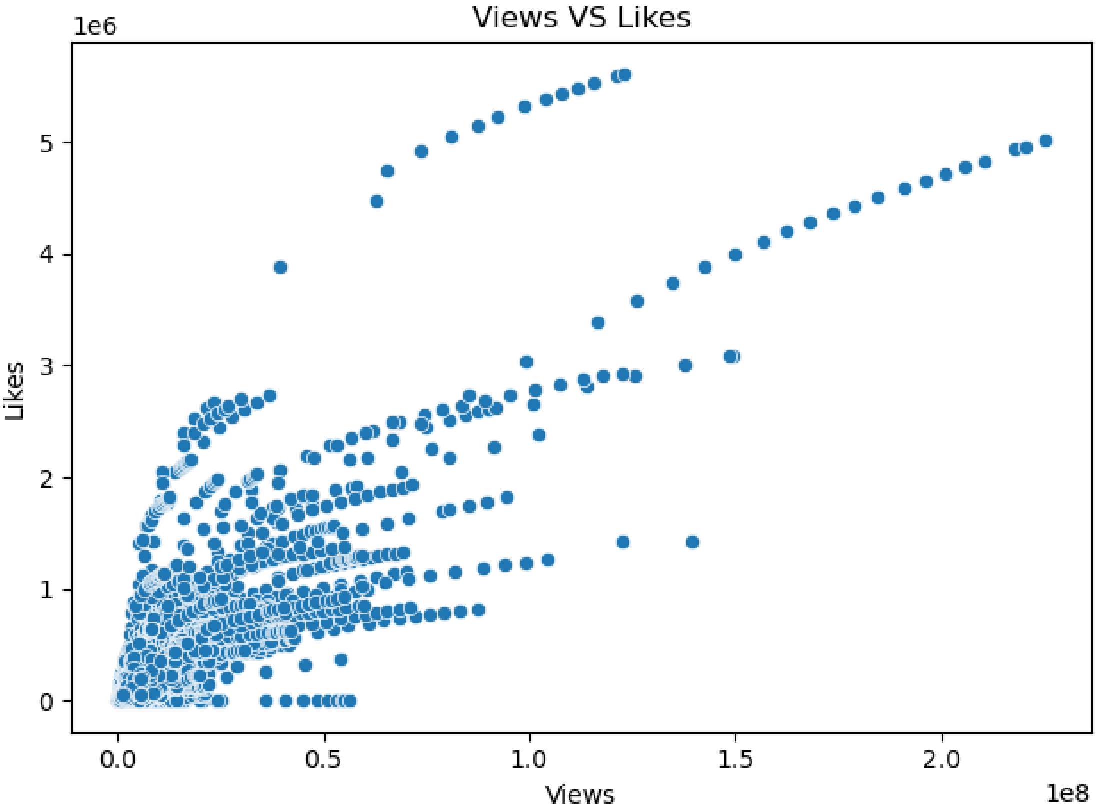


[20]:
```
df['publish_time'] = pd.to_datetime(df['publish_time'])
df['publish_date'] = df['publish_time'].dt.date
video_count_by_date = df.groupby('publish_date').size()
# Create a line plot
plt.figure(figsize = (12,6))
sns.lineplot(data = video_count_by_date)
plt.xlabel('Publish Date')
plt.ylabel('Number of Videos')
plt.title('Video published Over Time')
plt.xticks(rotation = 90)
plt.tight_layout()
plt.show()
```



[21]:

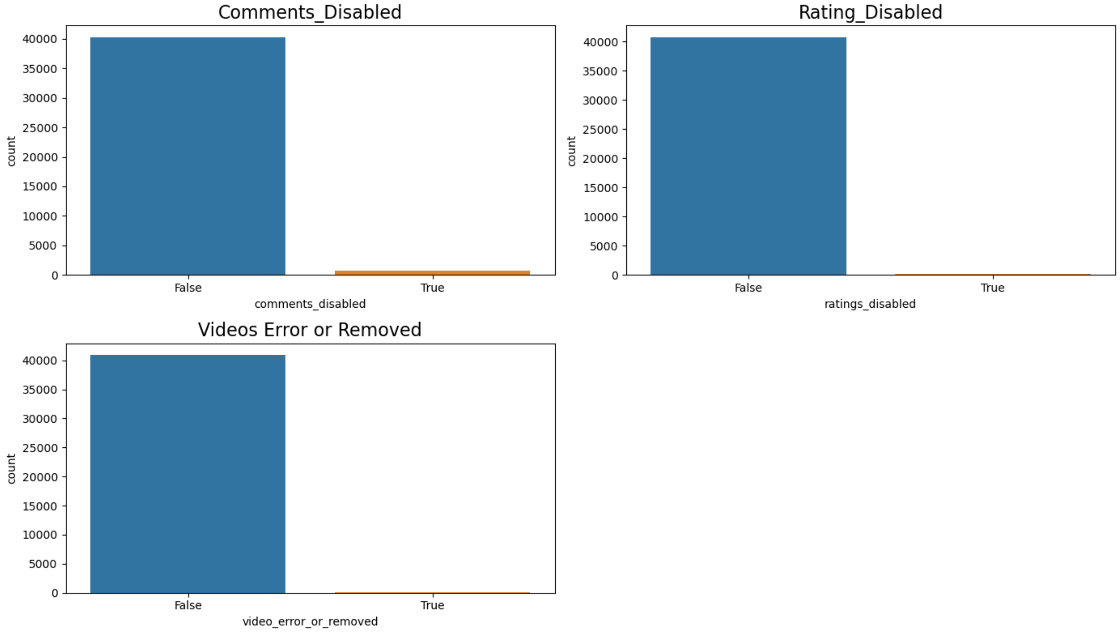
```
# Scatter Plot between 'views' and 'likes'
sns.scatterplot(data = df,x = 'views',y = 'likes')
plt.xlabel('Views')
plt.ylabel('Likes')
plt.title('Views VS Likes')
plt.tight_layout()
plt.show()
```



[22]:

```
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("Videos Error or Removed", fontsize = 16)
plt.tight_layout()
plt.show()
```



[23]:

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

[23]:

```
0.8491785476230509
```

[ ]: