YTAnalysis-Out

April 11, 2020

[1]:
```
import pandas as pd
import numpy as np
from datetime import date
import calendar
import json
import matplotlib.pyplot as plt
```

[2]:
```
root_path = '/Users/amishra/DEV/DataEngineering.Labs.AirflowProject/
↪DataEngg-Airflow/'
```

[3]:
```
# Parameters
root_path = "/Users/amishra/DEV/DataEngineering.Labs.AirflowProject/
↪DataEngg-Airflow/"
```

[4]:
```
raw_file_path = root_path + 'raw/'
date_formatted = str(date.today().strftime("%Y%m%d"))
```

[5]:
```
raw_fileIN = raw_file_path + 'INvideos.csv'
raw_fileUS = raw_file_path + 'USvideos.csv'
raw_fileCA = raw_file_path + 'CAvideos.csv'
raw_fileFR = raw_file_path + 'FRvideos.csv'
raw_fileDE = raw_file_path + 'DEvideos.csv'
raw_fileGB = raw_file_path + 'GBvideos.csv'
```

[6]:
```
df_IN = pd.read_csv(raw_fileIN)
df_US = pd.read_csv(raw_fileUS)
df_CA = pd.read_csv(raw_fileCA)
df_FR = pd.read_csv(raw_fileFR)
df_DE = pd.read_csv(raw_fileDE)
df_GB = pd.read_csv(raw_fileGB)
```

[7]:
```
#Adding Month column
```

[8]:
```
df_IN['month'] = df_IN.apply(lambda row: calendar.month_name[int(row.
↪trending_date.split(".")[2])], axis=1)
df_US['month'] = df_US.apply(lambda row: calendar.month_name[int(row.
↪trending_date.split(".")[2])], axis=1)
```

```
df_CA['month'] = df_CA.apply(lambda row: calendar.month_name[int(row.
↪trending_date.split(".")[2])], axis=1)
df_FR['month'] = df_FR.apply(lambda row: calendar.month_name[int(row.
↪trending_date.split(".")[2])], axis=1)
df_DE['month'] = df_DE.apply(lambda row: calendar.month_name[int(row.
↪trending_date.split(".")[2])], axis=1)
df_GB['month'] = df_GB.apply(lambda row: calendar.month_name[int(row.
↪trending_date.split(".")[2])], axis=1)
```

[9]:
```
    country_list = ['IN', 'US', 'CA', 'FR', 'DE', 'GB']
    for i in country_list:
        with open(raw_file_path + i + '_category_id.json') as f:
            data = json.load(f)

    category_list = list()
    for c in data['items']:
        category_list.append([c['id'],c['snippet']['title']])
```

[10]:
```
df_categoryList = pd.DataFrame(category_list, columns = ['category_id',␣
↪'category_title'])
df_categoryList
df_categoryList_asint = df_categoryList.astype({'category_id': int})
```

[11]:
```
df_IN['month'] = df_IN.apply(lambda row: calendar.month_name[int(row.
↪trending_date.split(".")[2])], axis=1)
df_IN['country'] = 'India'
df_IN1 = df_IN[['month', 'category_id', 'views', 'likes', 'dislikes',␣
↪'comment_count', 'country']]
df_IN1
```

[11]:

	month	category_id	views	likes	dislikes	comment_count	country
0	November	1	1096327	33966	798	882	India
1	November	25	590101	735	904	0	India
2	November	24	473988	2011	243	149	India
3	November	23	1242680	70353	1624	2684	India
4	November	24	464015	492	293	66	India
…	…	…	…	…	…	…	…
37347	June	23	214378	3291	404	196	India
37348	June	24	406828	1726	478	1428	India
37349	June	24	386319	1216	453	697	India
37350	June	24	130263	698	115	65	India
37351	June	24	1278249	22466	1609	1205	India

[37352 rows x 7 columns]

[12]:
```
df_merge_categoryIN = pd.merge(df_categoryList_asint, df_IN1, on='category_id')
df_merge_categoryIN
```

[12]:

	category_id	category_title	month	views	likes	dislikes	comment_count	country
0	1	Film & Animation	November	1096327	33966	798	882	India
1	1	Film & Animation	November	35885754	829362	61195	101117	India
2	1	Film & Animation	November	249423	7861	68	364	India
3	1	Film & Animation	November	696515	12397	449	385	India
4	1	Film & Animation	November	269593	3931	390	640	India
…	…	…	…	…	…	…	…	…
37242	43	Shows	June	613807	4058	1084	666	India
37243	43	Shows	June	974503	4912	1361	778	India
37244	43	Shows	June	974503	4912	1361	778	India
37245	43	Shows	June	535254	3105	1403	898	India
37246	43	Shows	June	535254	3105	1403	898	India

[37247 rows x 8 columns]

[ ]:
```

```

[13]:
```
df_US['month'] = df_US.apply(lambda row: calendar.month_name[int(row.
↪trending_date.split(".")[2])], axis=1)
df_US['country'] = 'United States'
df_US1 = df_US[['month', 'category_id', 'views', 'likes', 'dislikes',␣
↪'comment_count', 'country']]
```

[14]:
```
df_merge_categoryUS = pd.merge(df_categoryList_asint, df_US1, on='category_id')
df_merge_categoryUS
```

[14]:

	category_id	category_title	month	views	likes	dislikes	comment_count	country
0	1	Film & Animation	November	826059	3543	119	1	United States
1	1	Film & Animation	November	50867	715	238	0	United States
2	1	Film & Animation	November	288922	7515	792	0	United States
3	1	Film & Animation	November	52591	2233	187	0	United States

```
4                1  Film & Animation  November  1751064  16430        945
…              …                …        …       …     …        …
40887           43             Shows      June  1324482  22413        608
40888           43             Shows      June  1332252  22461        610
40889           43             Shows      June  1340039  22504        615
40890           43             Shows      June  1345086  22542        615
40891           43             Shows      June  1351321  22587        616

       comment_count        country
0                340  United States
1                246  United States
2               2111  United States
3                255  United States
4               1231  United States
…               …             …
40887           1644  United States
40888           1648  United States
40889           1648  United States
40890           1649  United States
40891           1649  United States

[40892 rows x 8 columns]
```

[15]:
```
df_CA['month'] = df_CA.apply(lambda row: calendar.month_name[int(row.
 ↪trending_date.split(".")[2])], axis=1)
df_CA['country'] = 'Canada'
df_CA1 = df_CA[['month', 'category_id', 'views', 'likes', 'dislikes',␣
 ↪'comment_count', 'country']]
```

[16]:
```
df_merge_categoryCA = pd.merge(df_categoryList_asint, df_CA1, on='category_id')
df_merge_categoryCA
```

[16]:
```
       category_id    category_title     month    views  likes  dislikes  \
0                1  Film & Animation  November   158815    218        30
1                1  Film & Animation  November   308568  19541        70
2                1  Film & Animation  November  1096327  33966       798
3                1  Film & Animation  November   458964   4903       392
4                1  Film & Animation  November  2736733  58967      3492
…              …                …        …       …     …        …
40802           43             Shows      June   628962   3436      1483
40803           43             Shows      June   565220   3669      1188
40804           43             Shows      June   613807   4058      1084
40805           43             Shows      June   565091   3581      1408
40806           43             Shows      June   535254   3105      1403

       comment_count country
0                186  Canada
```

```
1                 495  Canada
2                 882  Canada
3                1289  Canada
4                7915  Canada
…                …     …
40802             736  Canada
40803             561  Canada
40804             666  Canada
40805             710  Canada
40806             898  Canada

[40807 rows x 8 columns]
```

[17]:
```
df_GB['month'] = df_GB.apply(lambda row: calendar.month_name[int(row.
 ↪trending_date.split(".")[2])], axis=1)
df_GB['country'] = 'United Kingdom'
df_GB1 = df_GB[['month', 'category_id', 'views', 'likes', 'dislikes',␣
 ↪'comment_count', 'country']]
```

[18]:
```
df_merge_categoryGB = pd.merge(df_categoryList_asint, df_GB1, on='category_id')
df_merge_categoryGB
```

[18]:
```
       category_id    category_title     month    views  likes  dislikes  \
0                1  Film & Animation  November  2794165   8874       939
1                1  Film & Animation  November  3037613  91393      2766
2                1  Film & Animation  November   333552  13372       454
3                1  Film & Animation  November    44921    688        19
4                1  Film & Animation  November   750287   8010       149
…              …                 …         …        …      …         …
38821           43            Shows      June  1664981  44245       357
38822           43            Shows      June  1673959  44316       357
38823           43            Shows      June  1686873  44434       360
38824           43            Shows      June  1699351  44506       361
38825           43            Shows      June  1709880  44588       360

       comment_count         country
0               1439  United Kingdom
1               7176  United Kingdom
2               1010  United Kingdom
3                  0  United Kingdom
4                320  United Kingdom
…              …              …
38821           4292  United Kingdom
38822           4311  United Kingdom
38823           4318  United Kingdom
38824           4323  United Kingdom
38825           4335  United Kingdom
```

```
[38826 rows x 8 columns]
```

[19]:
```
df_FR['month'] = df_FR.apply(lambda row: calendar.month_name[int(row.
 ↪trending_date.split(".")[2])], axis=1)
df_FR['country'] = 'France'
df_FR1 = df_FR[['month', 'category_id', 'views', 'likes', 'dislikes',␣
 ↪'comment_count', 'country']]
```

[20]:
```
df_merge_categoryFR = pd.merge(df_categoryList_asint, df_FR1, on='category_id')
df_merge_categoryFR
```

[20]:

	category_id	category_title	month	views	likes	dislikes	\
0	1	Film & Animation	November	102804	6306	179	
1	1	Film & Animation	November	48796	99	19	
2	1	Film & Animation	November	54031	227	35	
3	1	Film & Animation	November	123529	1370	180	
4	1	Film & Animation	November	6708	98	4	
…	…	…	…	…	…	…	
40605	43	Shows	June	613807	4058	1084	
40606	43	Shows	June	565091	3581	1408	
40607	43	Shows	June	720600	4303	709	
40608	44	Trailers	May	3136	54	0	
40609	44	Trailers	May	9804	138	9	

	comment_count	country
0	421	France
1	73	France
2	72	France
3	255	France
4	31	France
…	…	…
40605	666	France
40606	710	France
40607	627	France
40608	0	France
40609	0	France

```
[40610 rows x 8 columns]
```

[21]:
```
df_DE['month'] = df_DE.apply(lambda row: calendar.month_name[int(row.
 ↪trending_date.split(".")[2])], axis=1)
df_DE['country'] = 'Denmark'
df_DE1 = df_DE[['month', 'category_id', 'views', 'likes', 'dislikes',␣
 ↪'comment_count', 'country']]
```

[22]:
```
df_merge_categoryDE = pd.merge(df_categoryList_asint, df_DE1, on='category_id')
df_merge_categoryDE
```

[22]:

	category_id	category_title	month	views	likes	dislikes	comment_count	country
0	1	Film & Animation	November	62418	4749	44	425	Denmark
1	1	Film & Animation	November	286684	27188	435	943	Denmark
2	1	Film & Animation	November	149163	5452	97	280	Denmark
3	1	Film & Animation	November	31154	2107	29	444	Denmark
4	1	Film & Animation	November	123529	1370	180	255	Denmark
…	…	…	…	…	…	…	…	…
40579	43	Shows	June	628962	3436	1483	736	Denmark
40580	43	Shows	June	58703	340	174	0	Denmark
40581	43	Shows	June	565220	3669	1188	561	Denmark
40582	43	Shows	June	613807	4058	1084	666	Denmark
40583	44	Trailers	March	8804	0	0	0	Denmark

[40584 rows x 8 columns]

[23]:
```
pieces =␣
 ↪[df_merge_categoryDE,df_merge_categoryIN,df_merge_categoryUS,df_merge_categoryCA,df_merge_c
df_concatenated = pd.concat(pieces)
df_concatenated
```

[23]:

	category_id	category_title	month	views	likes	dislikes
0	1	Film & Animation	November	62418	4749	44
1	1	Film & Animation	November	286684	27188	435
2	1	Film & Animation	November	149163	5452	97
3	1	Film & Animation	November	31154	2107	29
4	1	Film & Animation	November	123529	1370	180
…	…	…	…	…	…	…
40605	43	Shows	June	613807	4058	1084
40606	43	Shows	June	565091	3581	1408
40607	43	Shows	June	720600	4303	709
40608	44	Trailers	May	3136	54	0

```
40609           44          Trailers       May    9804    138         9

       comment_count  country
0                425  Denmark
1                943  Denmark
2                280  Denmark
3                444  Denmark
4                255  Denmark
…                …       …
40605            666   France
40606            710   France
40607            627   France
40608              0   France
40609              0   France

[238966 rows x 8 columns]
```

[24]:
```
# df_concatenated.plot(x="category_title", y=["likes", "dislikes",␣
 ↪"comment_count"], kind="bar")
# plt.show()
```

[25]:
```
# df_concatenated['ratio'] = np.where(df_concatenated['dislikes'] == 0, 0,␣
 ↪df_concatenated['likes']/df_concatenated['dislikes'])
# df_concatenated
```

[26]:
```
# df_likes_over_dislikes = df_concatenated.
 ↪groupby(['country','category_title'])['ratio'].mean()
# df_likes_over_dislikes
```

[27]:
```
# df_concatenated.plot(kind='bar',x='country',y='likes',color='red')
# plt.show()
```

[28]:
```
df1_reduced = df_concatenated.filter(['likes', 'dislikes','views',␣
 ↪'country','category_title', 'comment_count'], axis=1)
```

[29]:
```
df_grouped = df1_reduced.groupby('country')['likes','dislikes'].sum()
df_grouped

# df1.plot(x="country", y=["likes", "dislikes"], kind="bar")
```

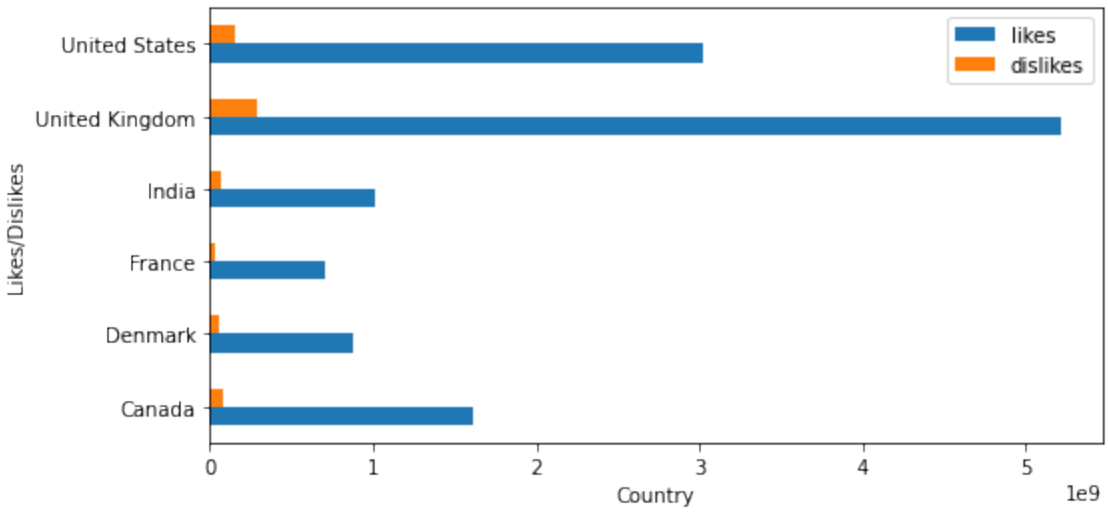
```
/Users/amishra/opt/anaconda3/envs/airflow/lib/python3.7/site-
packages/ipykernel_launcher.py:1: FutureWarning: Indexing with multiple keys
(implicitly converted to a tuple of keys) will be deprecated, use a list
instead.
  """Entry point for launching an IPython kernel.
```

[29]:

country	likes	dislikes
Canada	1607937265	79812112
Denmark	878794585	53052539
France	702156706	31957415
India	1011375558	62185412
United Kingdom	5210510328	290813530
United States	3026331552	148667774

[30]:
```
fig, ax = plt.subplots(figsize=(8,4))
df_grouped.plot(kind='barh',ax=ax)
ax.set_xlabel('Country')
ax.set_ylabel('Likes/Dislikes')
```

[30]: Text(0, 0.5, 'Likes/Dislikes')



[31]:
```
report_name = "/Users/amishra/DEV/AirflowProject/youtube_analysis_likes_" +␣
 ↪str(date.today().strftime("%Y%m%d"))
fig.savefig(report_name, dpi=300, bbox_inches='tight')
```

[32]:
```
df_grouped1 = df1_reduced.groupby('category_title')['likes','dislikes'].sum()
df_grouped1
```

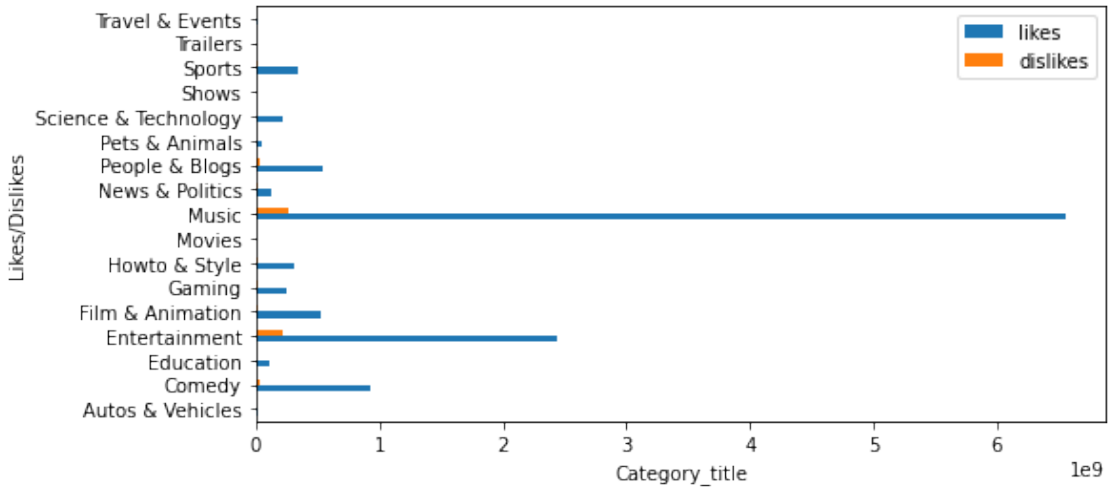
```
/Users/amishra/opt/anaconda3/envs/airflow/lib/python3.7/site-
packages/ipykernel_launcher.py:1: FutureWarning: Indexing with multiple keys
(implicitly converted to a tuple of keys) will be deprecated, use a list
instead.
  """Entry point for launching an IPython kernel.
```

[32]:

category_title	likes	dislikes
Autos & Vehicles	20811096	979224
Comedy	935473131	30159084
Education	111088716	3420767
Entertainment	2444170624	217151438
Film & Animation	530406633	22652042
Gaming	248969136	17359338
Howto & Style	303934248	11054249
Movies	1003685	50104
Music	6556219002	270435932
News & Politics	120747013	17107498
People & Blogs	540443304	39704523
Pets & Animals	48538847	1211440
Science & Technology	212502438	10125230
Shows	3966187	580237
Sports	347540086	23950565
Trailers	192	9
Travel & Events	11291656	547102

[33]:
```
fig, ax = plt.subplots(figsize=(8,4))
df_grouped1.plot(kind='barh',ax=ax)
ax.set_xlabel('Category_title')
ax.set_ylabel('Likes/Dislikes')
```

[33]:
```
Text(0, 0.5, 'Likes/Dislikes')
```



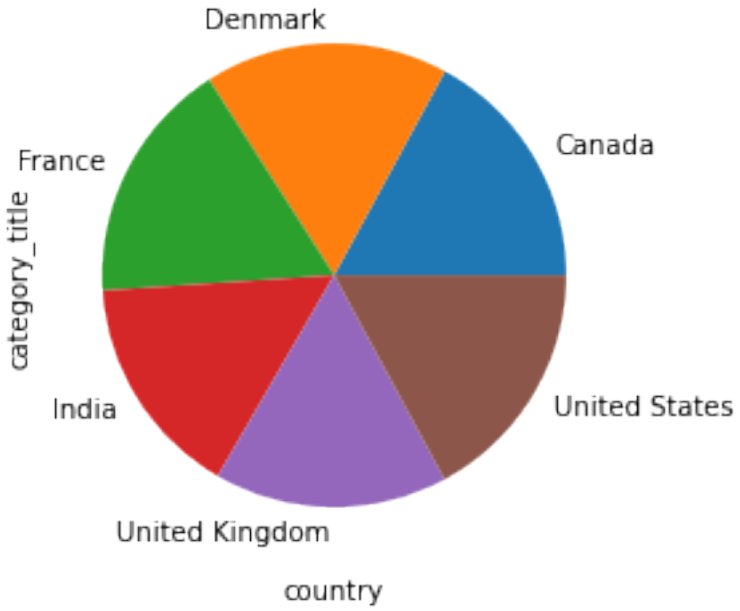
[34]:
```
report_name = "/Users/amishra/DEV/AirflowProject/report/
 ↪youtube_analysis_category_likes_" + str(date.today().strftime("%Y%m%d"))
fig.savefig(report_name, dpi=300, bbox_inches='tight')
```

[35]:
```
df2 = df1_reduced.groupby('country')['category_title'].count()
df2
```

[35]:
```
country
Canada            40807
Denmark           40584
France            40610
India             37247
United Kingdom    38826
United States     40892
Name: category_title, dtype: int64
```

[36]:
```
fig, ax = plt.subplots(figsize=(8,4))
df2.plot(kind='pie',ax=ax)
ax.set_xlabel('country')
ax.set_ylabel('category_title')
```

[36]:
```
Text(0, 0.5, 'category_title')
```



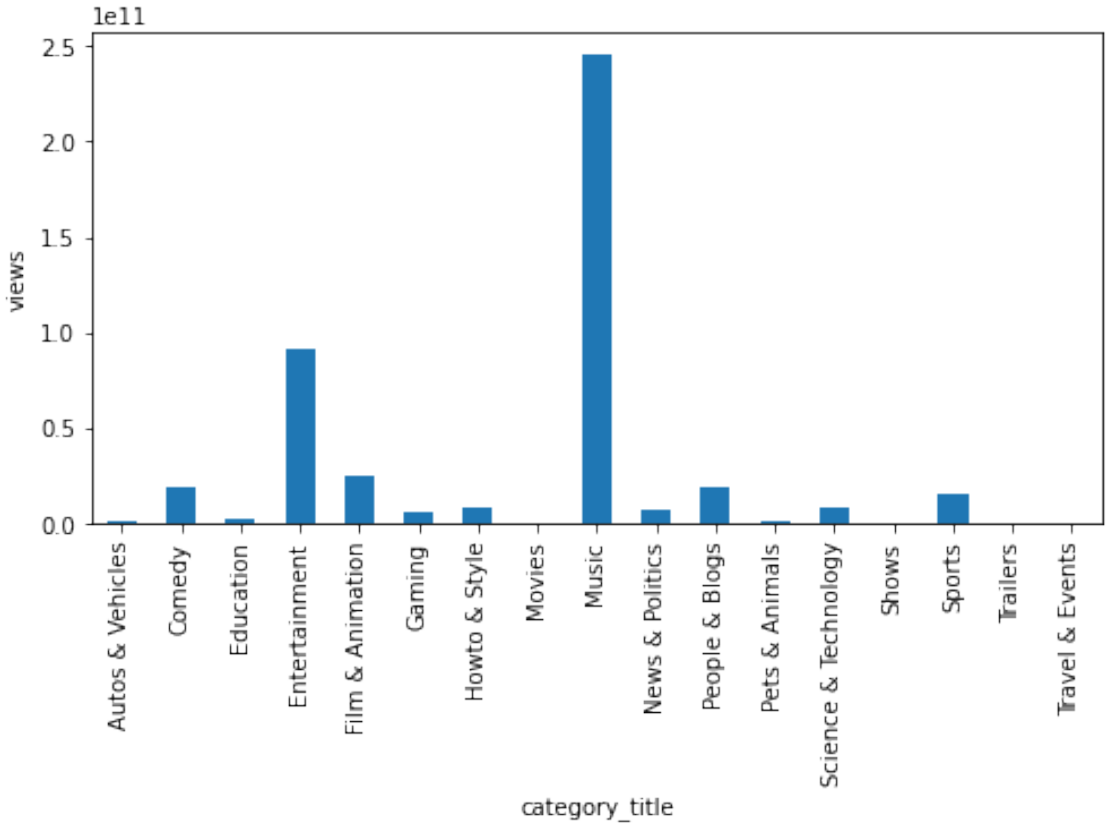
[37]:
```
report_name = "/Users/amishra/DEV/AirflowProject/report/category_country_" +␣
 ↪str(date.today().strftime("%Y%m%d"))
fig.savefig(report_name, dpi=300, bbox_inches='tight')
```

[38]:
```
df_views = df1_reduced.groupby('category_title')['views'].sum()
df_views
```

[38]:
```
category_title
Autos & Vehicles          1191203153
Comedy                   19214042009
Education                 2566838759
Entertainment            92064416642
Film & Animation         25108776049
Gaming                    6520609277
Howto & Style             8634558283
Movies                      70259728
Music                   245334769806
News & Politics           7832754385
People & Blogs           18738268524
Pets & Animals            1681882649
Science & Technology      8065799956
Shows                      393883758
Sports                   16058797531
Trailers                       21744
Travel & Events            650426123
Name: views, dtype: int64
```

[39]:
```
fig, ax = plt.subplots(figsize=(8,4))
df_views.plot(kind='bar',ax=ax)
ax.set_xlabel('category_title')
ax.set_ylabel('views')
```

[39]:
```
Text(0, 0.5, 'views')
```



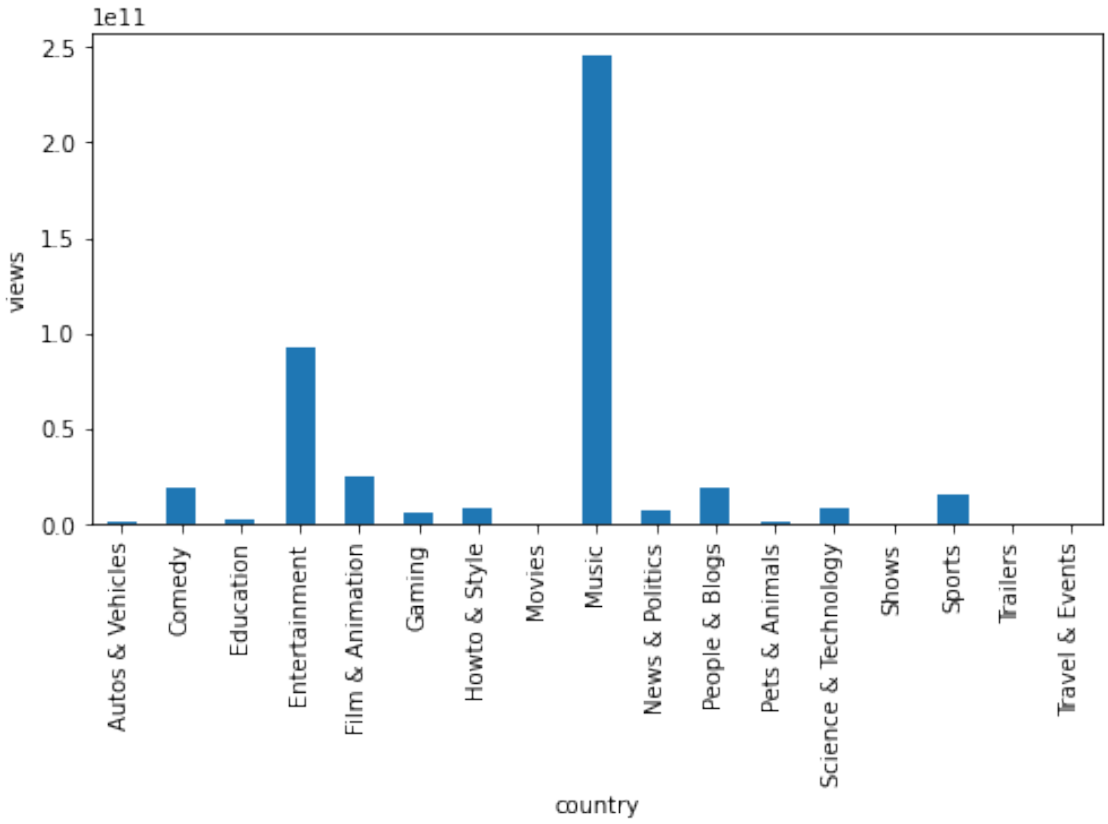
[40]:
```
report_name = "/Users/amishra/DEV/AirflowProject/report/category_views_" +␣
 ↪str(date.today().strftime("%Y%m%d"))
fig.savefig(report_name, dpi=300, bbox_inches='tight')
```

[41]:
```
df_views1 = df1_reduced.groupby('country')['views'].sum()
df_views1
```

[41]:
```
country
Canada             46776373446
Denmark            24485953077
France             17041407308
India              39604345873
United Kingdom    229716399912
United States      96502828760
Name: views, dtype: int64
```

[42]:
```
fig, ax = plt.subplots(figsize=(8,4))
df_views.plot(kind='bar',ax=ax)
ax.set_xlabel('country')
ax.set_ylabel('views')
```

[42]: Text(0, 0.5, 'views')



[43]:
```
report_name = "/Users/amishra/DEV/AirflowProject/report/country_views_" +␣
 ↪str(date.today().strftime("%Y%m%d"))
fig.savefig(report_name, dpi=300, bbox_inches='tight')
```

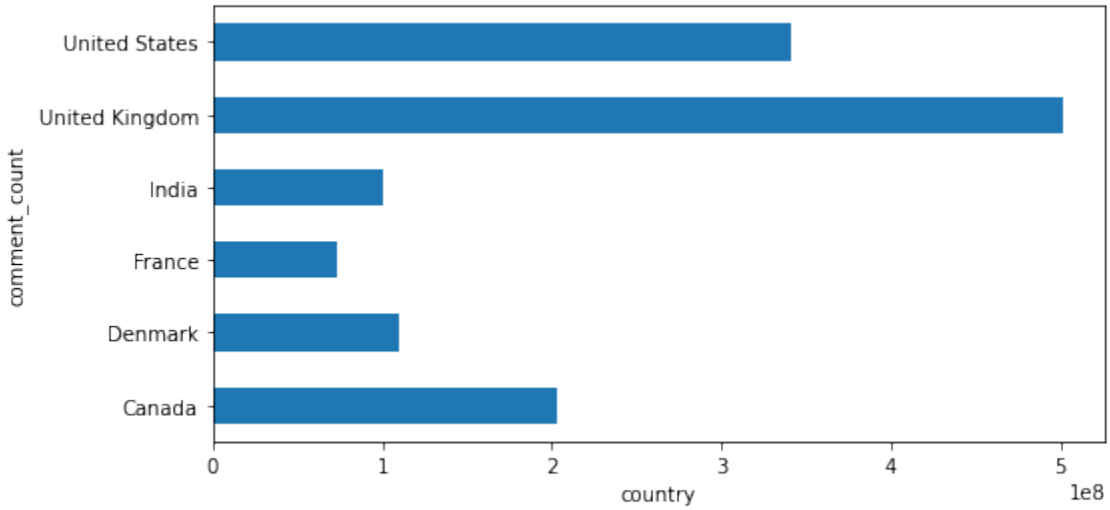
[44]:
```
df_comment_count = df1_reduced.groupby('country')['comment_count'].sum()
df_comment_count
```

[44]:
```
country
Canada            202939308
Denmark           109893659
France             72776211
India              99978364
United Kingdom    501673561
United States     341079367
Name: comment_count, dtype: int64
```

[45]:
```
fig, ax = plt.subplots(figsize=(8,4))
df_comment_count.plot(kind='barh',ax=ax)
ax.set_xlabel('country')
```

```
ax.set_ylabel('comment_count')
```

[45]:
```
Text(0, 0.5, 'comment_count')
```



[46]:
```
report_name = "/Users/amishra/DEV/AirflowProject/report/country_commentCount_"␣
↪+ str(date.today().strftime("%Y%m%d"))
fig.savefig(report_name, dpi=300, bbox_inches='tight')
```

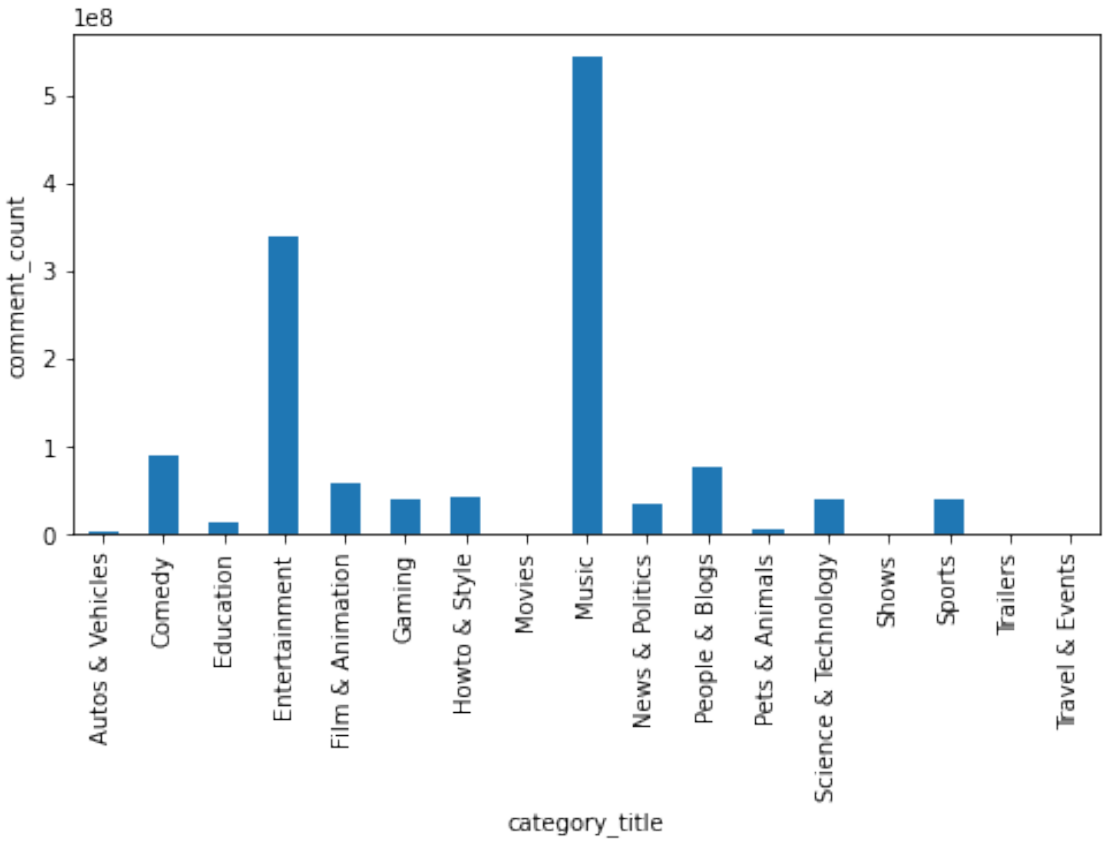
[47]:
```
df_comment_count1 = df1_reduced.groupby('category_title')['comment_count'].sum()
df_comment_count1
```

[47]:
```
category_title
Autos & Vehicles          3257344
Comedy                   90698925
Education                12647380
Entertainment           340193588
Film & Animation         57582056
Gaming                   38947871
Howto & Style            43140068
Movies                      55636
Music                   543407983
News & Politics          33632592
People & Blogs           75995320
Pets & Animals            6779425
Science & Technology     39261853
Shows                      470471
Sports                   40423205
Trailers                        0
Travel & Events           1846753
```

```
Name: comment_count, dtype: int64
```

[48]:
```
fig, ax = plt.subplots(figsize=(8,4))
df_comment_count1.plot(kind='bar',ax=ax)
ax.set_xlabel('category_title')
ax.set_ylabel('comment_count')
```

[48]:
```
Text(0, 0.5, 'comment_count')
```



[49]:
```
report_name = "/Users/amishra/DEV/AirflowProject/report/category_commentCount_"␣
↪+ str(date.today().strftime("%Y%m%d"))
fig.savefig(report_name, dpi=300, bbox_inches='tight')
```

[ ]: