Imports

[1]:
```
import pandas as pd
import plotly.express as px
```

Reading the raw data from a csv

[2]:
```
raw_data=pd.read_csv('Global YouTube Statistics.csv', encoding='unicode_escape')
```

[3]:
```
raw_data
```

[3]:

	rank	Youtuber	subscribers	video views	category	Title	uploads	Country	Abbreviation	channel_type	...	subscribers_for_last_30_days	created_year	created_month	created_
0	1	T-Series	245000000	2.280000e+11	Music	T-Series	20082	India	IN	Music	...	2000000.0	2006.0	Mar	
1	2	YouTube Movies	170000000	0.000000e+00	Film & Animation	youtubemovies	1	United States	US	Games	...	NaN	2006.0	Mar	
2	3	MrBeast	166000000	2.836884e+10	Entertainment	MrBeast	741	United States	US	Entertainment	...	8000000.0	2012.0	Feb	
3	4	Cocomelon - Nursery Rhymes	162000000	1.640000e+11	Education	Cocomelon - Nursery Rhymes	966	United States	US	Education	...	1000000.0	2006.0	Sep	
4	5	SET India	159000000	1.480000e+11	Shows	SET India	116536	India	IN	Entertainment	...	1000000.0	2006.0	Sep	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
990	991	Natan por Aï¿½	12300000	9.029610e+09	Sports	Natan por Aï¿½	1200	Brazil	BR	Entertainment	...	700000.0	2017.0	Feb	
991	992	Free Fire India Official	12300000	1.674410e+09	People & Blogs	Free Fire India Official	1500	India	IN	Games	...	300000.0	2018.0	Sep	
992	993	Panda	12300000	2.214684e+09	NaN	HybridPanda	2452	United Kingdom	GB	Games	...	1000.0	2006.0	Sep	
993	994	RobTopGames	12300000	3.741235e+08	Gaming	RobTopGames	39	Sweden	SE	Games	...	100000.0	2012.0	May	
994	995	Make Joke Of	12300000	2.129774e+09	Comedy	Make Joke Of	62	India	IN	Comedy	...	100000.0	2017.0	Aug	

995 rows × 28 columns

Checking for nulls

[4]:
```
raw_data.isnull().sum()/raw_data.count()*100
```

[4]:
```
rank                                        0.000000
Youtuber                                    0.000000
subscribers                                 0.000000
video views                                 0.000000
category                                    4.847208
Title                                       0.000000
uploads                                     0.000000
Country                                    13.974800
Abbreviation                               13.974800
channel_type                                3.108808
video_views_rank                            0.100604
country_rank                               13.196815
channel_type_rank                           3.430353
video_views_for_the_last_30_days            5.963791
lowest_monthly_earnings                     0.000000
highest_monthly_earnings                    0.000000
lowest_yearly_earnings                      0.000000
highest_yearly_earnings                     0.000000
subscribers_for_last_30_days               51.215805
created_year                                0.505051
created_month                               0.505051
created_date                                0.505051
Gross tertiary education enrollment (%)    14.105505
Population                                 14.105505
Unemployment rate                          14.105505
Urban_population                           14.105505
Latitude                                   14.105505
Longitude                                  14.105505
dtype: float64
```

Droping columns with Nulls since they are not needed in the following analysis

[5]:
```
to_drop=raw_data.isnull().sum().apply(lambda col: (col > 0))
```

[6]:
```
data=raw_data.loc[:,~to_drop]
```

[7]:
```
data.isnull().sum()
```

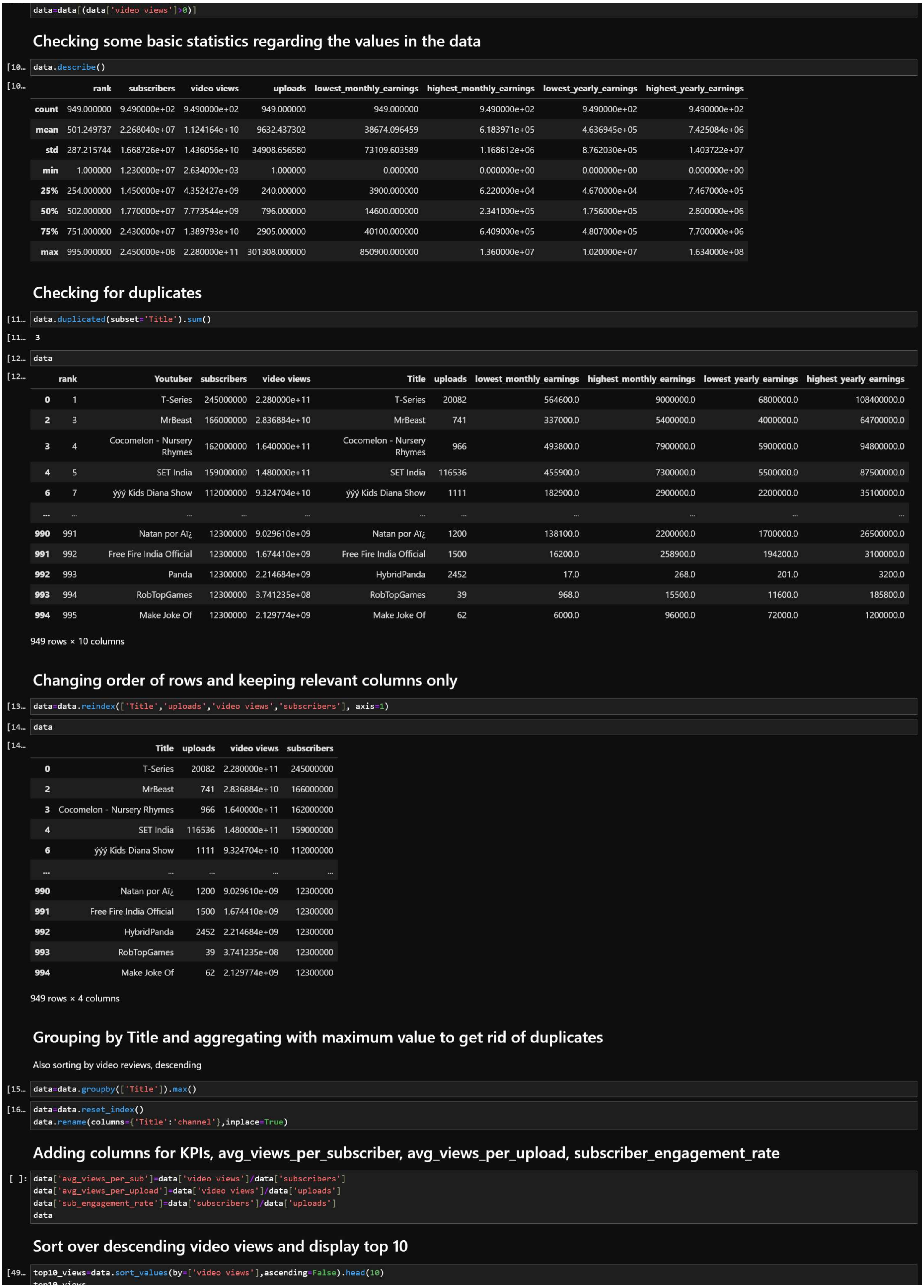
[7]:
```
rank                        0
Youtuber                    0
subscribers                 0
video views                 0
Title                       0
uploads                     0
lowest_monthly_earnings     0
highest_monthly_earnings    0
lowest_yearly_earnings      0
highest_yearly_earnings     0
dtype: int64
```

Exporting the data to a csv file for use with other software

[8]:
```
data.to_csv('Global YouTube Statistics_reduced.csv')
```

Filtering the data to drop channels containing no uploads or views, for instance some channels owned by Youtube

[9]:
```
data=data[(data['uploads']>0)]
```



```
data=data[(data['video views']>0)]
```

Checking some basic statistics regarding the values in the data

[10…
```
data.describe()
```

[10…

	rank	subscribers	video views	uploads	lowest_monthly_earnings	highest_monthly_earnings	lowest_yearly_earnings	highest_yearly_earnings
count	949.000000	9.490000e+02	9.490000e+02	949.000000	949.000000	9.490000e+02	9.490000e+02	9.490000e+02
mean	501.249737	2.268040e+07	1.124164e+10	9632.437302	38674.096459	6.183971e+05	4.636945e+05	7.425084e+06
std	287.215744	1.668726e+07	1.436056e+10	34908.656580	73109.603589	1.168612e+06	8.762030e+05	1.403722e+07
min	1.000000	1.230000e+07	2.634000e+03	1.000000	0.000000	0.000000e+00	0.000000e+00	0.000000e+00
25%	254.000000	1.450000e+07	4.352427e+09	240.000000	3900.000000	6.220000e+04	4.670000e+04	7.467000e+05
50%	502.000000	1.770000e+07	7.773544e+09	796.000000	14600.000000	2.341000e+05	1.756000e+05	2.800000e+06
75%	751.000000	2.430000e+07	1.389793e+10	2905.000000	40100.000000	6.409000e+05	4.807000e+05	7.700000e+06
max	995.000000	2.450000e+08	2.280000e+11	301308.000000	850900.000000	1.360000e+07	1.020000e+07	1.634000e+08

Checking for duplicates

[11…
```
data.duplicated(subset='Title').sum()
```

[11… 3

[12…
```
data
```

[12…

	rank	Youtuber	subscribers	video views	Title	uploads	lowest_monthly_earnings	highest_monthly_earnings	lowest_yearly_earnings	highest_yearly_earnings
0	1	T-Series	245000000	2.280000e+11	T-Series	20082	564600.0	9000000.0	6800000.0	108400000.0
2	3	MrBeast	166000000	2.836884e+10	MrBeast	741	337000.0	5400000.0	4000000.0	64700000.0
3	4	Cocomelon - Nursery Rhymes	162000000	1.640000e+11	Cocomelon - Nursery Rhymes	966	493800.0	7900000.0	5900000.0	94800000.0
4	5	SET India	159000000	1.480000e+11	SET India	116536	455900.0	7300000.0	5500000.0	87500000.0
6	7	ýýý Kids Diana Show	112000000	9.324704e+10	ýýý Kids Diana Show	1111	182900.0	2900000.0	2200000.0	35100000.0
...	...	...	...	...	...	...	...	...	...	...
990	991	Natan por Aï¿	12300000	9.029610e+09	Natan por Aï¿	1200	138100.0	2200000.0	1700000.0	26500000.0
991	992	Free Fire India Official	12300000	1.674410e+09	Free Fire India Official	1500	16200.0	258900.0	194200.0	3100000.0
992	993	Panda	12300000	2.214684e+09	HybridPanda	2452	17.0	268.0	201.0	3200.0
993	994	RobTopGames	12300000	3.741235e+08	RobTopGames	39	968.0	15500.0	11600.0	185800.0
994	995	Make Joke Of	12300000	2.129774e+09	Make Joke Of	62	6000.0	96000.0	72000.0	1200000.0

949 rows × 10 columns

Changing order of rows and keeping relevant columns only

[13…
```
data=data.reindex(['Title','uploads','video views','subscribers'], axis=1)
```

[14…
```
data
```

[14…

	Title	uploads	video views	subscribers
0	T-Series	20082	2.280000e+11	245000000
2	MrBeast	741	2.836884e+10	166000000
3	Cocomelon - Nursery Rhymes	966	1.640000e+11	162000000
4	SET India	116536	1.480000e+11	159000000
6	ýýý Kids Diana Show	1111	9.324704e+10	112000000
...	...	...	...	...
990	Natan por Aï¿	1200	9.029610e+09	12300000
991	Free Fire India Official	1500	1.674410e+09	12300000
992	HybridPanda	2452	2.214684e+09	12300000
993	RobTopGames	39	3.741235e+08	12300000
994	Make Joke Of	62	2.129774e+09	12300000

949 rows × 4 columns

Grouping by Title and aggregating with maximum value to get rid of duplicates

Also sorting by video reviews, descending

[15…
```
data=data.groupby(['Title']).max()
```

[16…
```
data=data.reset_index()
data.rename(columns={'Title':'channel'},inplace=True)
```

Adding columns for KPIs, avg_views_per_subscriber, avg_views_per_upload, subscriber_engagement_rate

[ ]:
```
data['avg_views_per_sub']=data['video views']/data['subscribers']
data['avg_views_per_upload']=data['video views']/data['uploads']
data['sub_engagement_rate']=data['subscribers']/data['uploads']
data
```

Sort over descending video views and display top 10

[49…
```
top10_views=data.sort_values(by=['video views'],ascending=False).head(10)
top10_views
```

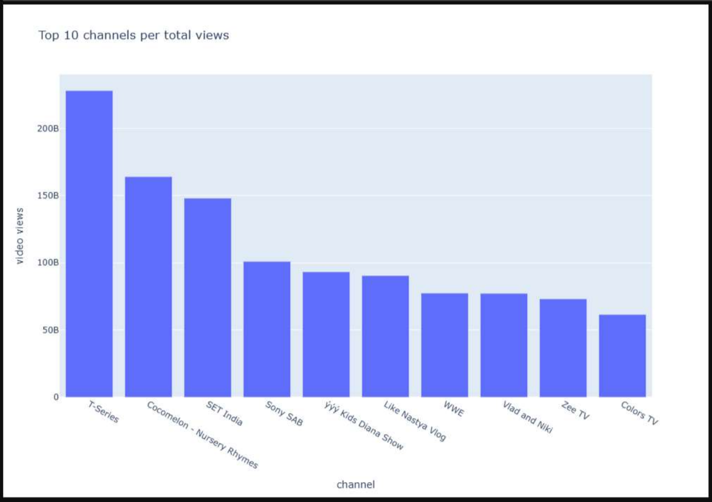
```
top10_views
```

[49…

	channel	uploads	video views	subscribers	avg_views_per_sub	avg_views_per_upload	sub_engagement_rate
672	T-Series	20082	2.280000e+11	245000000	930.612245	1.135345e+07	12199.980082
140	Cocomelon - Nursery Rhymes	966	1.640000e+11	162000000	1012.345679	1.697723e+08	167701.863354
612	SET India	116536	1.480000e+11	159000000	930.817610	1.269994e+06	1364.385254
653	Sony SAB	71270	1.010000e+11	83000000	1216.867470	1.417146e+06	1164.585380
913	ýýý Kids Diana Show	1111	9.324704e+10	112000000	832.562862	8.393073e+07	100810.081008
421	Like Nastya Vlog	493	9.047906e+10	106000000	853.576038	1.835275e+08	215010.141988
789	WWE	70127	7.742847e+10	96000000	806.546601	1.104118e+06	1368.944914
773	Vlad and Niki	574	7.718017e+10	98900000	780.385944	1.344602e+08	172299.651568
831	Zee TV	129204	7.313905e+10	70500000	1037.433397	5.660742e+05	545.648742
146	Colors TV	112915	6.151091e+10	64600000	952.181215	5.447541e+05	572.111765

[50…

```
bar_top_views=px.bar(top10_views, x='channel', y='video views', title='Top 10 channels per total views', width=1000, height=700)
bar_top_views.show()
```



Sort over descending subscribers and display top 10

[51…

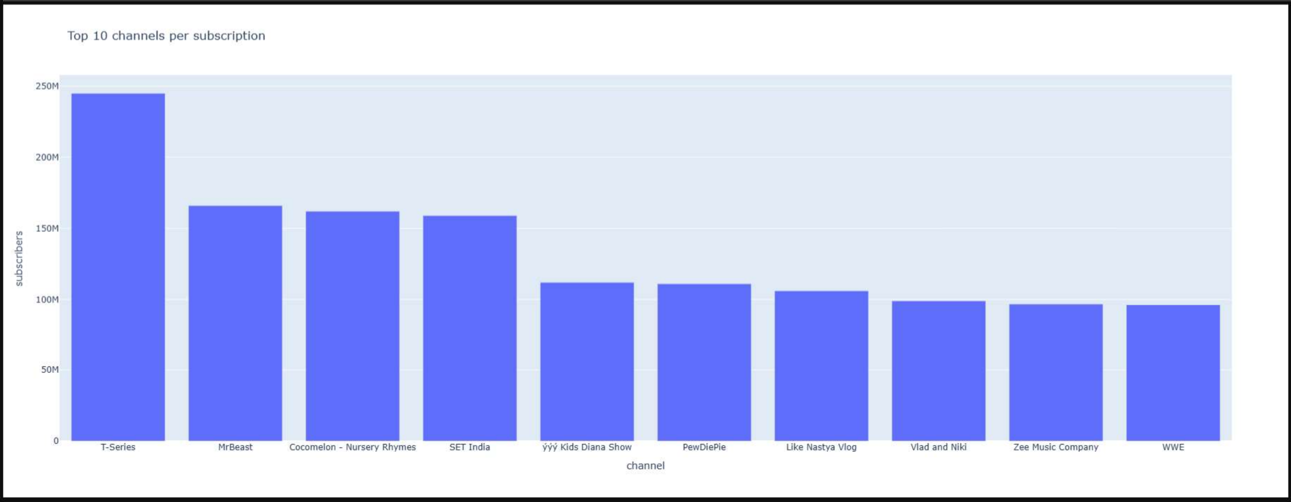
```
top10_subs=data.sort_values(by=['subscribers'],ascending=False).head(10)
top10_subs
```

[51…

	channel	uploads	video views	subscribers	avg_views_per_sub	avg_views_per_upload	sub_engagement_rate
672	T-Series	20082	2.280000e+11	245000000	930.612245	1.135345e+07	12199.980082
497	MrBeast	741	2.836884e+10	166000000	170.896638	3.828454e+07	224021.592443
140	Cocomelon - Nursery Rhymes	966	1.640000e+11	162000000	1012.345679	1.697723e+08	167701.863354
612	SET India	116536	1.480000e+11	159000000	930.817610	1.269994e+06	1364.385254
913	ýýý Kids Diana Show	1111	9.324704e+10	112000000	832.562862	8.393073e+07	100810.081008
558	PewDiePie	4716	2.905804e+10	111000000	261.784184	6.161587e+06	23536.895674
421	Like Nastya Vlog	493	9.047906e+10	106000000	853.576038	1.835275e+08	215010.141988
773	Vlad and Niki	574	7.718017e+10	98900000	780.385944	1.344602e+08	172299.651568
829	Zee Music Company	8548	5.785629e+10	96700000	598.307026	6.768401e+06	11312.587740
789	WWE	70127	7.742847e+10	96000000	806.546601	1.104118e+06	1368.944914

[52…

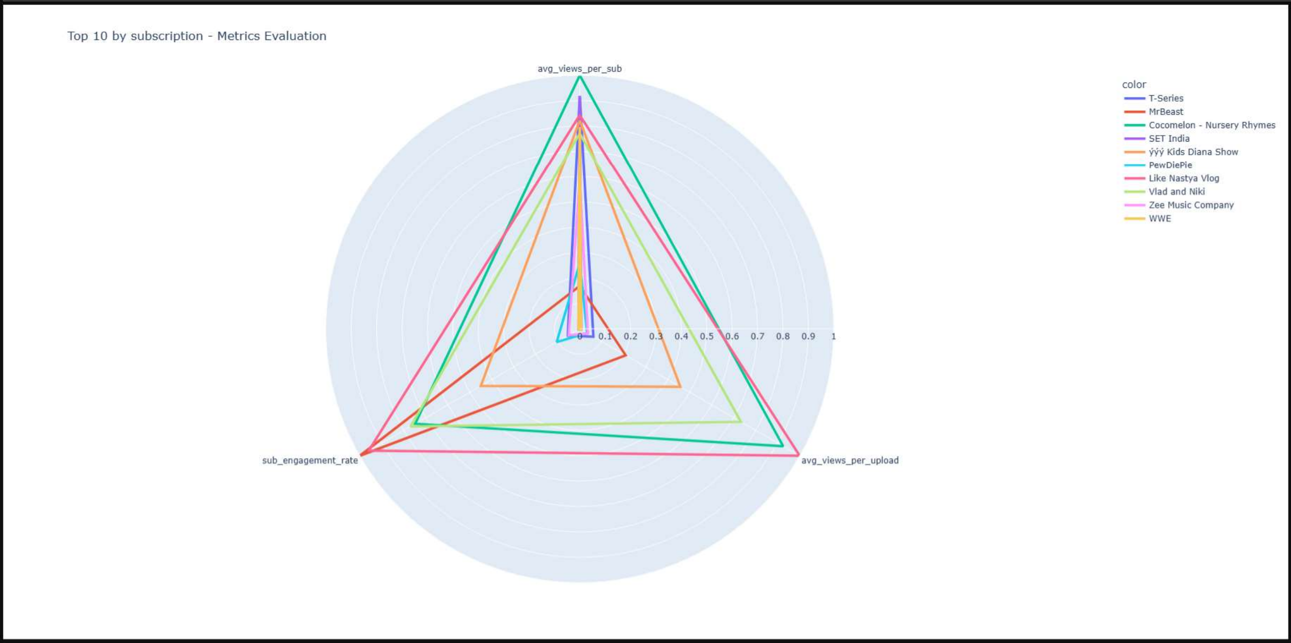
```
bar_top_subs=px.bar(top10_subs, x='channel', y='subscribers', title='Top 10 channels per subscription', width=1000, height=700)
bar_top_subs.show()
```



Evaluate top 10 lists (both by views and by subscribers) with a radar plot

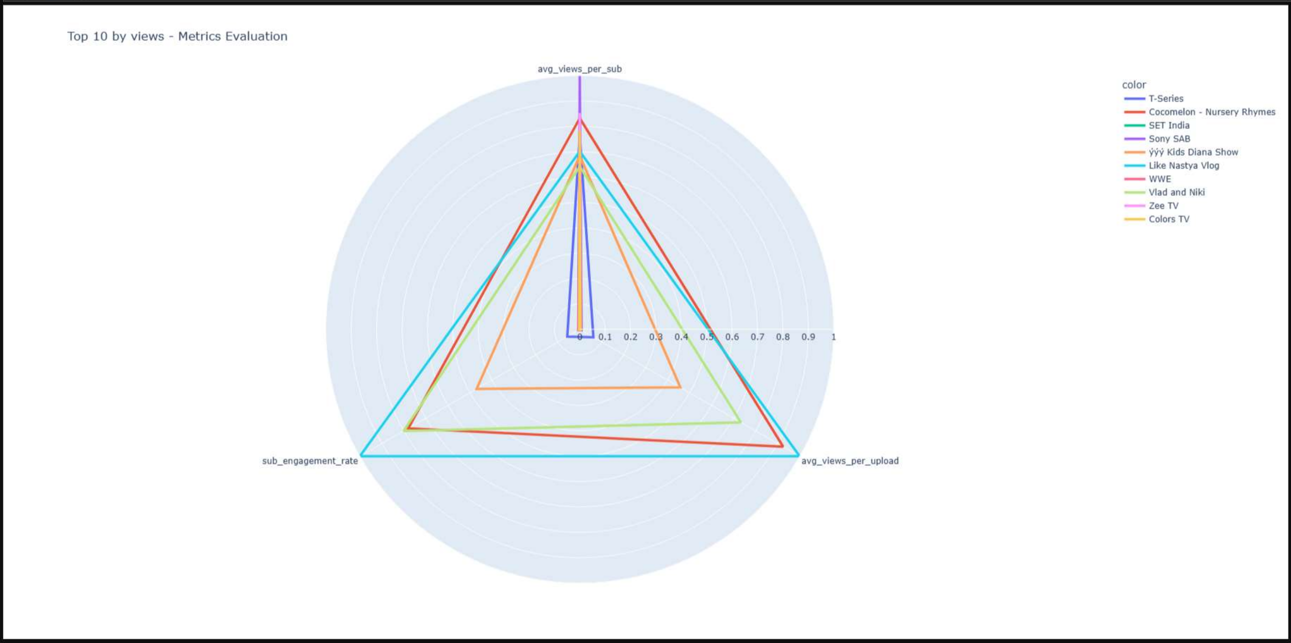
[87…

```
temp=[]

for i in range(len(top10_subs)):
    df = pd.DataFrame(dict(
        r=top10_subs.iloc[i].values[-3:]/[top10_subs['avg_views_per_sub'].max(), top10_subs['avg_views_per_upload'].max(), top10_subs['sub_engagement_rate'].max()],
        theta=['avg_views_per_sub', 'avg_views_per_upload', 'sub_engagement_rate'],
        color=top10_subs.iloc[i].values[0]))
    temp.append(df)
df = pd.concat(temp, axis=0)
fig = px.line_polar(df, r='r', color='color', theta='theta', line_close=True, width=1200, height=900, title='Top 10 by subscription - Metrics Evaluation')
fig.update_traces(line=dict(width=3.5))
fig.show()
```



[88…

```
temp=[]

for i in range(len(top10_views)):
    df = pd.DataFrame(dict(
        r=top10_views.iloc[i].values[-3:]/[top10_views['avg_views_per_sub'].max(), top10_views['avg_views_per_upload'].max(), top10_views['sub_engagement_rate'].max()],
        theta=['avg_views_per_sub', 'avg_views_per_upload', 'sub_engagement_rate'],
        color=top10_views.iloc[i].values[0]))
    temp.append(df)
df = pd.concat(temp, axis=0)
fig = px.line_polar(df, r='r', color='color', theta='theta', line_close=True, width=1200, height=900, title='Top 10 by views - Metrics Evaluation')
fig.update_traces(line=dict(width=3.5))
fig.show()
```



Results : Good candidates for marketing investment

In both metrics evaluation graphs, the 3 dominating candidate channels seem to be

Like Nastya Vlog

Cocomelon - Nursery Rhymes

Vlad and Niki