Shorya Mehra
86052200035

Welcome

What?

Steps

Conclusion

YouTube

Statistical Analysis

Course: **Functional Programming**
Professor: **Dr. Kavita Jain**

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Welcome

What?

Steps

Conclusion

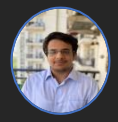
What is Data Analysis?

- Data analysis is the act of turning raw, messy data into useful insights by cleaning the data up, transforming it, manipulating it, and inspecting it.

- The insights gathered from the data are then presented visually in the form of charts, graphs, or dashboards.

- The insights discovered can help aid the company’s or organization’s growth. Decision-makers will be able to come to an actionable conclusion and make the right business decisions.

Tools for Data Analysis



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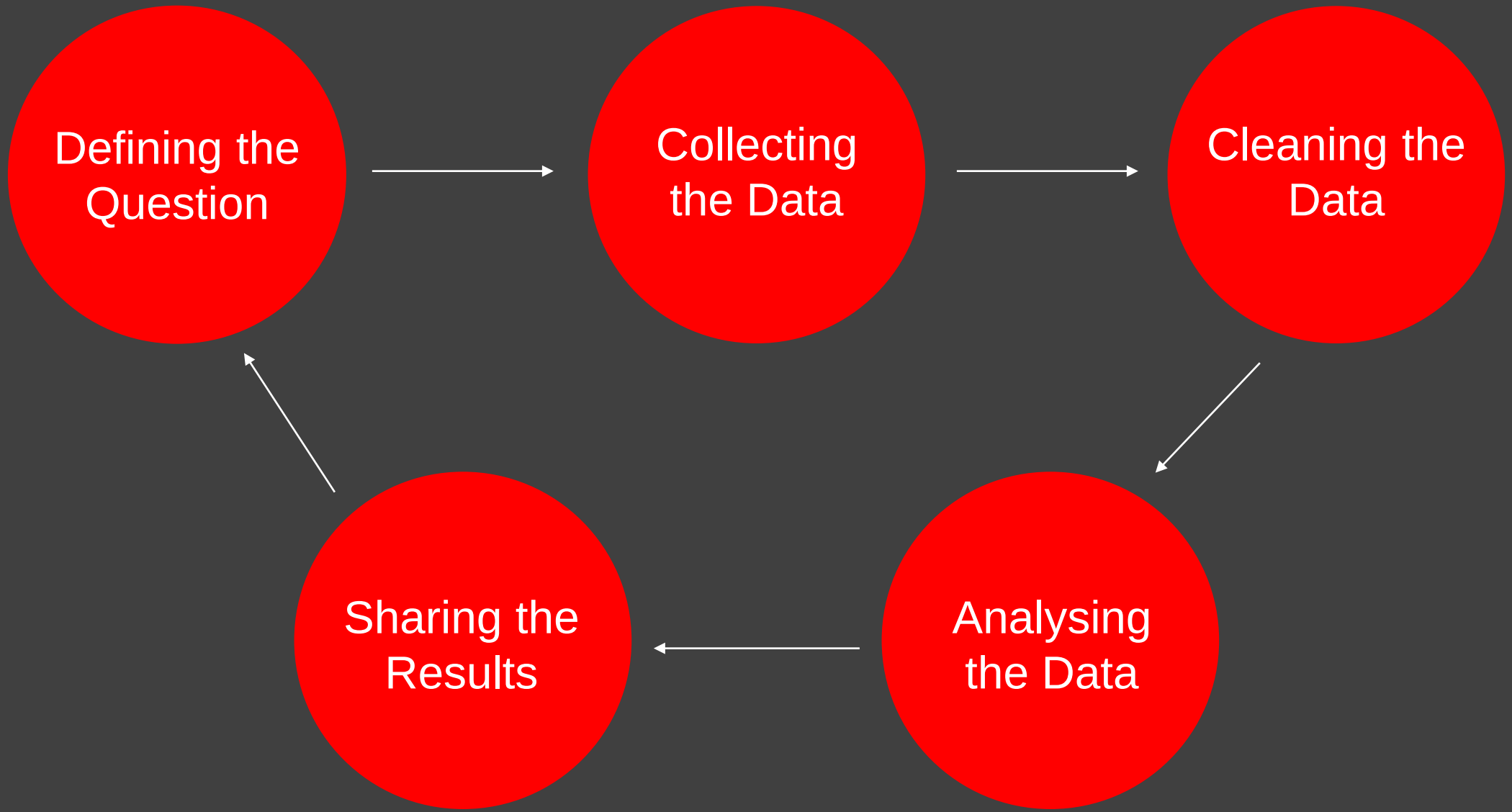
Steps of Data Analysis


Defining the Question
Collecting the Data
Cleaning the Data
Analysing the Data
Sharing the Results

Step 1 | Defining the Question

- The first step in any data analysis process is to define your objective. In data analytics jargon, this is sometimes called the ‘problem statement’.

- Defining your objective means coming up with a hypothesis and figuring how to test it. Start by asking: What business problem am I trying to solve? While this might sound straightforward, it can be trickier than it seems.

YouTube

youtube.com/ShoryaMehra

Views **Likes** **Comments** **Keywords**

Step 2 | Collecting the Data

- Once you’ve established your objective, you’ll need to create a strategy for collecting and aggregating the appropriate data. A key part of this is determining which data you need.

- This might be quantitative (numeric) data, e.g. sales figures, or qualitative (descriptive) data, such as customer reviews.

	Title	Video ID	Published At	Keyword	Likes	Comments	Views
0	Apple Pay	wAZZ-UW(	23-08-2022	tech	3407	672	135612
1	The most E	b3x28s61q	24-08-2022	tech	76779	4306	1758063
2	My New H	4mgePWW	23-08-2022	tech	63825	3338	1564007
3	Petrol Vs L	kXiYSI7H2b	23-08-2022	tech	71566	1426	922918
4	Best Back	ErMwWXC	08-08-2022	tech	96513	5155	1855644
5	Brewmast	18fwz9Itbv	05-11-2021	tech	33570	1643	943119
6	Tech Mon	jXf04bhcjb	13-06-2022	tech	135047	9367	5937790
7	I bought th	2TqOmtTA	07-08-2022	tech	216935	12605	4782514
8	15 Emergi	wLlL46pYc	08-12-2021	tech	45565	2882	7001236
9	Toxicologi	R7qsau3X6	14-07-2022	tech	24252	1068	667767
10	Dope Tech	MEiq0oCU	15-08-2022	tech	118001	4123	2359142
11	Cool Tech	pT_9hntW	06-08-2022	tech	20999	3091	413179
12	Cool Back	cj4lxmHQV	13-08-2022	tech	15322	547	389114
13	Best Tech/	d-BdIo8_w	15-12-2021	tech	17866	157	444953
14	My Massiv	eFhhW6fs/	09-07-2022	tech	13217	442	371563
15	Why Mille	N88OE2ZC	04-06-2021	tech	26890	4999	1633059
16	10 Coolest	PKATJiyz0i	13-08-2021	tech	9562	199	760249
17	17 Coolest	qiMnSaZW	21-07-2022	tech	11743	143	1086568
18	Almost EV	4AnyhHl3_	14-08-2022	tech	146978	11105	3186890
19	I bought th	nmY2kgW'	25-03-2022	tech	363771	13609	11422924
20	iPhone 14	HMqyLcNr	24-08-2022	tech	2117	486	63650
21	Doctor An	Q2ysbTVlP	12-05-2022	tech	42841	1357	1280387
22	Cool Tech	zI8KQq5zn	02-07-2022	tech	23689	2842	530889
23	Wolfgang	iEAlq1GPgı	18-06-2021	tech	55231	2175	2122433
24	Battle Of T	IHnhSxizV(	31-07-2022	tech	1289	183	35948
25	OnePlus 1(	Ql1-RZ2FU	24-08-2022	tech	970	207	23175

kaggle™

bit.ly/shoryadata

salesforce

sas

Step 3 | Cleaning the Data

- Once you’ve established your objective, you’ll need to create a strategy for collecting and aggregating the appropriate data. A key part of this is determining which data you need.

- This might be quantitative (numeric) data, e.g. sales figures, or qualitative (descriptive) data, such as customer reviews.

- This step is also known as **Data Preprocessing**.

pandas

```
vid_df = pd.DataFrame(pd.read_csv("videos-stats.csv"))
```

```
vid_df.head().reset_index(drop=True).style.background_gradient(cmap="Reds")
```

	Unnamed: 0	Title	Video ID	Published At	Keyword	Likes	Comments	Views
0	0	Apple Pay Is Killing the Physical Wallet After Only Eight Years | Tech News Briefing Podcast | WSJ	wAZZ-UWGVHI	2022-08-23	tech	3407.000000	672.000000	135612.000000
1	1	The most EXPENSIVE thing I own.	b3x28s61q3c	2022-08-24	tech	76779.000000	4306.000000	1758063.000000
2	2	My New House Gaming Setup is SICK!	4mgePWWCAmA	2022-08-23	tech	63825.000000	3338.000000	1564007.000000
3	3	Petrol Vs Liquid Nitrogen | Freezing Experiment | പെട്രോളിനെ ഐസ് ആകാൻ പറ്റുമോ | M4 Tech |	kXiYSI7H2b0	2022-08-23	tech	71566.000000	1426.000000	922918.000000
4	4	Best Back to School Tech 2022!	ErMwWXQxHp0	2022-08-08	tech	96513.000000	5155.000000	1855644.000000

```
vid_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1881 entries, 0 to 1880
Data columns (total 8 columns):
 #   Column        Non-Null Count  Dtype  
---  ------        --------------  -----  
 0   Unnamed: 0    1881 non-null   int64  
 1   Title         1881 non-null   object 
 2   Video ID      1881 non-null   object 
 3   Published At  1881 non-null   object 
 4   Keyword       1881 non-null   object 
 5   Likes         1879 non-null   float64
 6   Comments      1879 non-null   float64
 7   Views         1879 non-null   float64
dtypes: float64(3), int64(1), object(4)
memory usage: 117.7+ KB
```

```
vid_df.describe()[["Likes", "Comments","Views"]].style.background_gradient(cmap="Reds")
```

	Likes	Comments	Views
count	1879.000000	1879.000000	1879.000000
mean	170061.020756	7863.331559	11612916.491219
std	796229.267020	37879.964926	108444994.303802
min	-1.000000	-1.000000	25.000000
25%	2672.500000	199.000000	84515.000000
50%	14787.000000	814.000000	591721.000000
75%	60906.000000	3377.500000	2804977.500000
max	16445558.000000	732818.000000	4034122271.000000

```
vid_df.isnull().sum()
```

```
Unnamed: 0      0
Title           0
Video ID        0
Published At    0
Keyword         0
Likes           2
Comments        2
Views           2
dtype: int64
```

```
vid_df.dropna(axis=0,inplace=True )
```

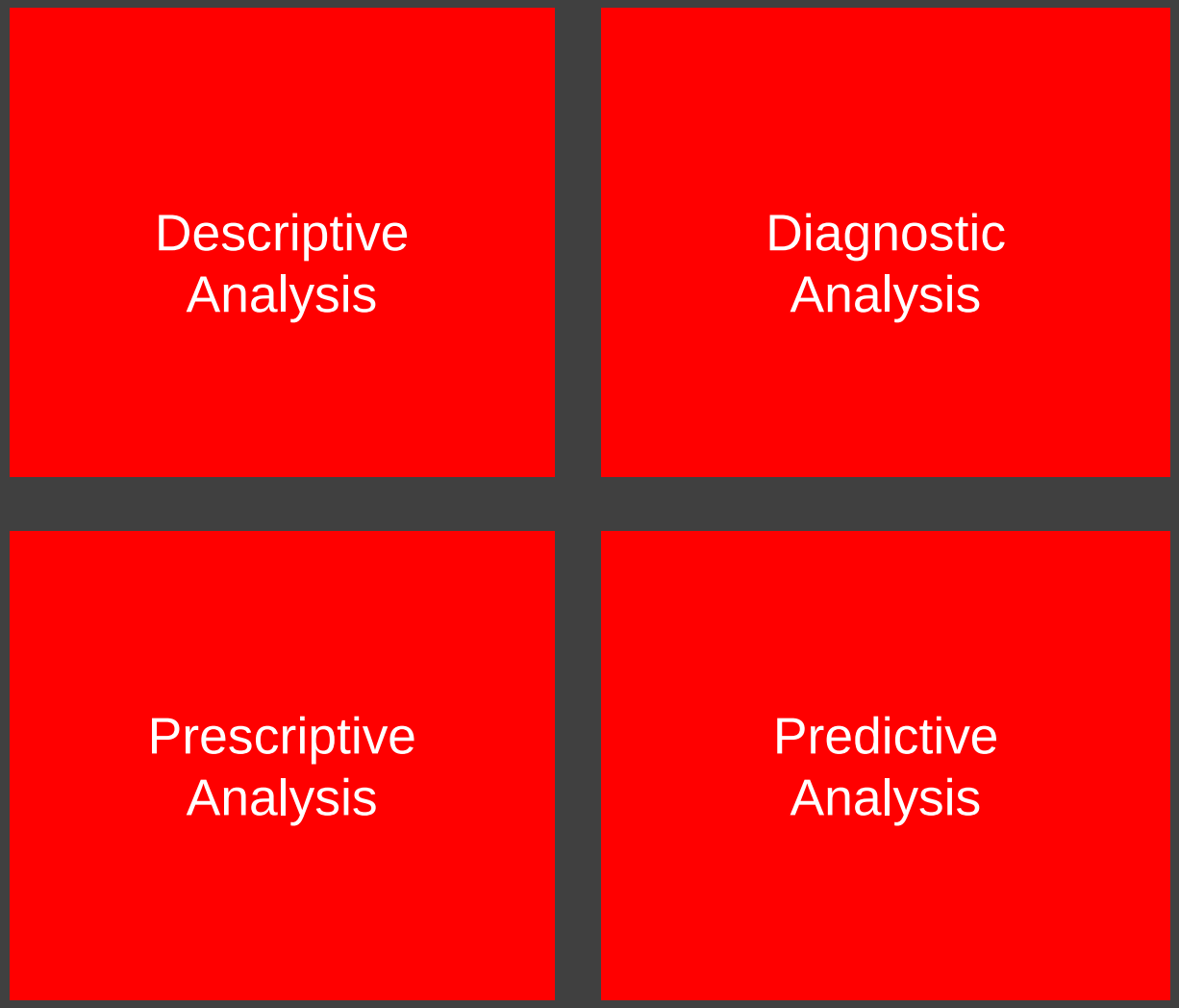
```
vid_df.isnull().sum()
```

```
Unnamed: 0      0
Title           0
Video ID        0
Published At    0
Keyword         0
Likes           0
Comments        0
Views           0
dtype: int64
```

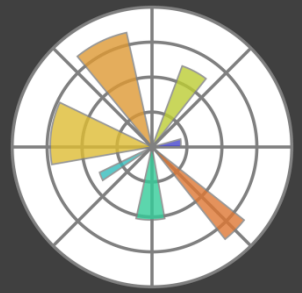
```
vid_df.shape
```

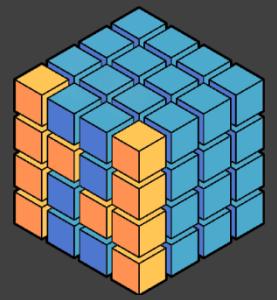
```
(1879, 8)
```

Step 4 | Analysing the Data


Descriptive Analysis
Diagnostic Analysis
Prescriptive Analysis
Predictive Analysis

Exploratory Data Analysis (EDA)





```
vid_df = pd.DataFrame(pd.read_csv("videos-stats.csv"))
```

```
vid_df.head().reset_index(drop=True).style.background_gradient(cmap="Reds")
```

	Unnamed: 0	Title	Video ID	Published At	Keyword	Likes	Comments	Views
0	0	Apple Pay Is Killing the Physical Wallet After Only Eight Years | Tech News Briefing Podcast | WSJ	wAZZ-UWGVHI	2022-08-23	tech	3407.000000	672.000000	135612.000000
1	1	The most EXPENSIVE thing I own.	b3x28s61q3c	2022-08-24	tech	76779.000000	4306.000000	1758063.000000
2	2	My New House Gaming Setup is SICK!	4mgePWWCAmA	2022-08-23	tech	63825.000000	3338.000000	1564007.000000
3	3	Petrol Vs Liquid Nitrogen | Freezing Experiment | പെട്രോളിനെ ഐസ് ആകാൻ പറ്റുമോ | M4 Tech |	kXiYSI7H2b0	2022-08-23	tech	71566.000000	1426.000000	922918.000000
4	4	Best Back to School Tech 2022!	ErMwWXQxHp0	2022-08-08	tech	96513.000000	5155.000000	1855644.000000

Most Liked Videos

```
max_like_vids = vid_df.nlargest(10,"Likes")
max_like_vids[["Title", "Likes"]].reset_index(drop=True).set_index([pd.Index([1,2,3,4,5,6,7,8,9,10])]).style.background_gradient(
```

	Title	Likes
1	El Chombo - Dame Tu Cosita feat. Cutty Ranks (Official Video) [Ultra Music]	16445558.000000
2	$456,000 Squid Game In Real Life!	14259033.000000
3	Martin Garrix - Animals (Official Video)	11025176.000000
4	Powfu - death bed (coffee for your head) (Official Video) ft. beabadoobee	7786057.000000
5	The Weeknd - Save Your Tears (Official Music Video)	6823113.000000
6	Glass Animals - Heat Waves (Official Video)	6177588.000000
7	I Spent 50 Hours Buried Alive	6055504.000000
8	Maroon 5 - Animals (Official Music Video)	5743875.000000
9	history of the entire world, i guess	5471653.000000
10	One Direction - History (Official Video)	5400589.000000

Keyword-Like Graph

```
stats_likes_df = vid_df[['Keyword', 'Likes']].groupby(['Keyword']).agg(['max', 'min', 'mean', 'sum'])
stats_likes_df.sort_values(by=('Likes', 'sum'), ascending=False).style.background_gradient(cmap='Reds')
```

	Likes			
	max	min	mean	sum
Keyword				
mrbeast	14259033.000000	31521.000000	2105914.360000	105295718.000000
animals	11025176.000000	37.000000	760775.789474	28909480.000000
google	16445558.000000	-1.000000	471167.488889	21202537.000000
bed	7786057.000000	25.000000	473682.181818	20842016.000000
cubes	2307773.000000	150.000000	303061.200000	15153060.000000
music	6823113.000000	94.000000	314188.108696	14452653.000000
history	5471653.000000	160.000000	273410.660000	13670533.000000
marvel	1790536.000000	-1.000000	210379.200000	10518960.000000
tutorial	981522.000000	1341.000000	167720.880000	8386044.000000
how-to	1165120.000000	63.000000	158898.145833	7627111.000000
mukbang	1221507.000000	-1.000000	141406.644444	6363299.000000
apple	4144389.000000	184.000000	118078.904762	4959314.000000
physics	1194852.000000	962.000000	98700.900000	4935045.000000
food	672749.000000	774.000000	95014.645833	4560703.000000
sports	867074.000000	15.000000	90518.877551	4435425.000000
reaction	3001265.000000	462.000000	73959.780000	3697989.000000

```
vid_df["Published At"] = pd.to_datetime(vid_df["Published At"])
stats_time_df = vid_df.sort_values(by='Published At').reset_index(drop=True).sort_values(by="Published At", ascending=False)
stats_time_df.drop("Video ID", axis=1,inplace=True)
```

Ten Latest Videos

```
stats_time_df.head(10)[["Title",'Published At', 'Views', 'Likes', 'Comments']].reset_index(drop=True).set_index([pd.Index([1,2,3
```

	Title	Published At	Views	Likes	Comments
1	ASI serán las VOTACIONES MC LIVE 2022!	2022-08-24 00:00:00	1044608.000000	98631.000000	3188.000000
2	Xbox REVEALS Big Updates For Xbox Series X Exclusives & Xbox Game Pass For PC | Xbox News	2022-08-24 00:00:00	16396.000000	926.000000	258.000000
3	The REAL REASON Bitcoin Will Hit $500,000 Per Coin By 2030 (NOT CLICKBAIT)	2022-08-24 00:00:00	77109.000000	5595.000000	641.000000
4	Youtuber Gets Sued By Crypto Millionaire	2022-08-24 00:00:00	474368.000000	27738.000000	2355.000000
5	Biden Announces Plan For Federal Student Loan Debt Relief	2022-08-24 00:00:00	54596.000000	1200.000000	2841.000000
6	Apple September 7 iPhone 14 Event ANNOUNCED! 🥳 EVERYTHING We're Getting!	2022-08-24 00:00:00	83807.000000	4187.000000	723.000000
7	Andrew Tate Announces New "Business" After Ban	2022-08-24 00:00:00	26499.000000	441.000000	496.000000
8	Apple's September 7th iPhone 14 Event Everything Leaked!	2022-08-24 00:00:00	42191.000000	1294.000000	163.000000
9	Apple Announces Fall iPhone Event (iPhone 14, Apple Watch Pro & More)	2022-08-24 00:00:00	47811.000000	915.000000	107.000000
10	Biden plans to forgive $300 billion in student loan debt: Report	2022-08-24 00:00:00	60528.000000	1573.000000	2670.000000

Ten Oldest Videos ¶

```
stats_time_df.tail(10)[["Title",'Published At', 'Views', 'Likes', 'Comments']].reset_index(drop=True).set_index([pd.Index([1,2,3,
```

	Title	Published At	Views	Likes	Comments
10	J. Holiday - Bed (Official Music Video)	2007-07-16 00:00:00	78137822.000000	515049.000000	16568.000000
9	J Holiday - Bed	2007-12-11 00:00:00	26826274.000000	119272.000000	3743.000000
8	Pink Floyd - We Don't Need No Education Lyrics in Description!	2008-07-25 00:00:00	7178954.000000	50074.000000	3095.000000
7	Biology: Digestive System Video	2009-02-16 00:00:00	17716356.000000	132214.000000	5981.000000
6	Ice Cube - It Was A Good Day	2009-02-24 00:00:00	168546247.000000	2307773.000000	71897.000000
5	Bon Jovi - Bed Of Roses (Official Music Video)	2009-06-17 00:00:00	302125099.000000	1072689.000000	37571.000000
4	Girls Aloud - Biology	2009-06-26 00:00:00	7073338.000000	18353.000000	2560.000000
3	The Animals - House of the Rising Sun (1964) HQ/Widescreen ♫ 58 YEARS AGO	2009-07-03 00:00:00	153478497.000000	1357197.000000	39624.000000
2	Lec 1 | MIT 6.00 Introduction to Computer Science and Programming, Fall 2008	2009-08-20 00:00:00	6091315.000000	61813.000000	3416.000000
1	Yung Berg - The Business ft. Casha	2009-10-25 00:00:00	28325416.000000	229141.000000	7461.000000

Most Viewed Videos

```
most_views = vid_df.nlargest(10,"Views").reset_index(drop=True)[["Title","Views"]].set_index([pd.Index([1,2,3,4,5,6,7,8,9,10])])
most_views.style.background_gradient(cmap="Reds")
```

	Title	Views
1	El Chombo - Dame Tu Cosita feat. Cutty Ranks (Official Video) [Ultra Music]	4034122271.000000
2	Martin Garrix - Animals (Official Video)	1582262997.000000
3	The Weeknd - Save Your Tears (Official Music Video)	915457091.000000
4	Maroon 5 - Animals (Official Music Video)	826423766.000000
5	Powfu - death bed (coffee for your head) (Official Video) ft. beabadoobee	524709805.000000
6	One Direction - History (Official Video)	434352213.000000
7	PIKOTARO - PPAP (Pen Pineapple Apple Pen) (Long Version) [Official Video]	425478119.000000
8	Glass Animals - Heat Waves (Official Video)	378164492.000000
9	Young Money - Bed Rock (Official Music Video)	321977550.000000
10	Rihanna - California King Bed	308501014.000000

Most Commented/Discussed Videos

```
most_comments = vid_df.nlargest(10,"Comments").reset_index(drop=True)[["Title","Comments"]].set_index([pd.Index([1,2,3,4,5,6,7,8,
most_comments.style.background_gradient(cmap="Reds")
```

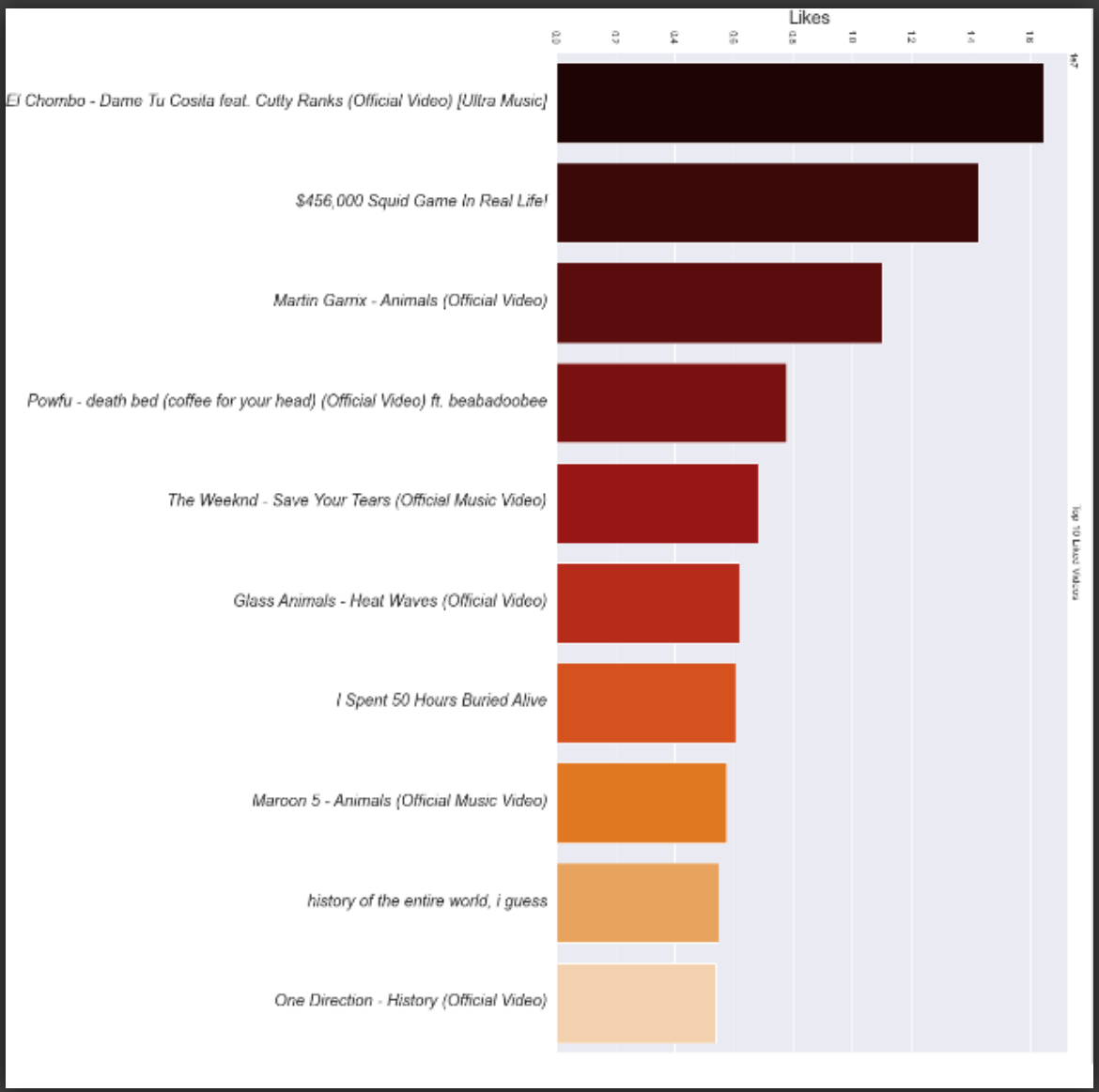
	Title	Comments
1	El Chombo - Dame Tu Cosita feat. Cutty Ranks (Official Video) [Ultra Music]	732818.000000
2	I Opened A Restaurant That Pays You To Eat At It	728774.000000
3	$456,000 Squid Game In Real Life!	611757.000000
4	One Direction - History (Official Video)	434688.000000
5	history of the entire world, i guess	395657.000000
6	Martin Garrix - Animals (Official Video)	335455.000000
7	PIKOTARO - PPAP (Pen Pineapple Apple Pen) (Long Version) [Official Video]	294428.000000
8	The Weeknd - Save Your Tears (Official Music Video)	270948.000000
9	I Spent 50 Hours Buried Alive	239172.000000
10	I Gave My 100,000,000th Subscriber An Island	224423.000000

Step 5 | Sharing the Results

- The final step of the data analytics process is to share these insights with the wider world.

- This is more complex than simply sharing the raw results of your work—it involves interpreting the outcomes, and presenting them in a manner that's digestible for all types of audiences.

- Since you'll often present information to decision-makers, it's very important that the insights you present are 100% clear and unambiguous. For this reason, data analysts commonly use reports, dashboards, and interactive visualizations to support their findings.


Likes
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1.2
1.4
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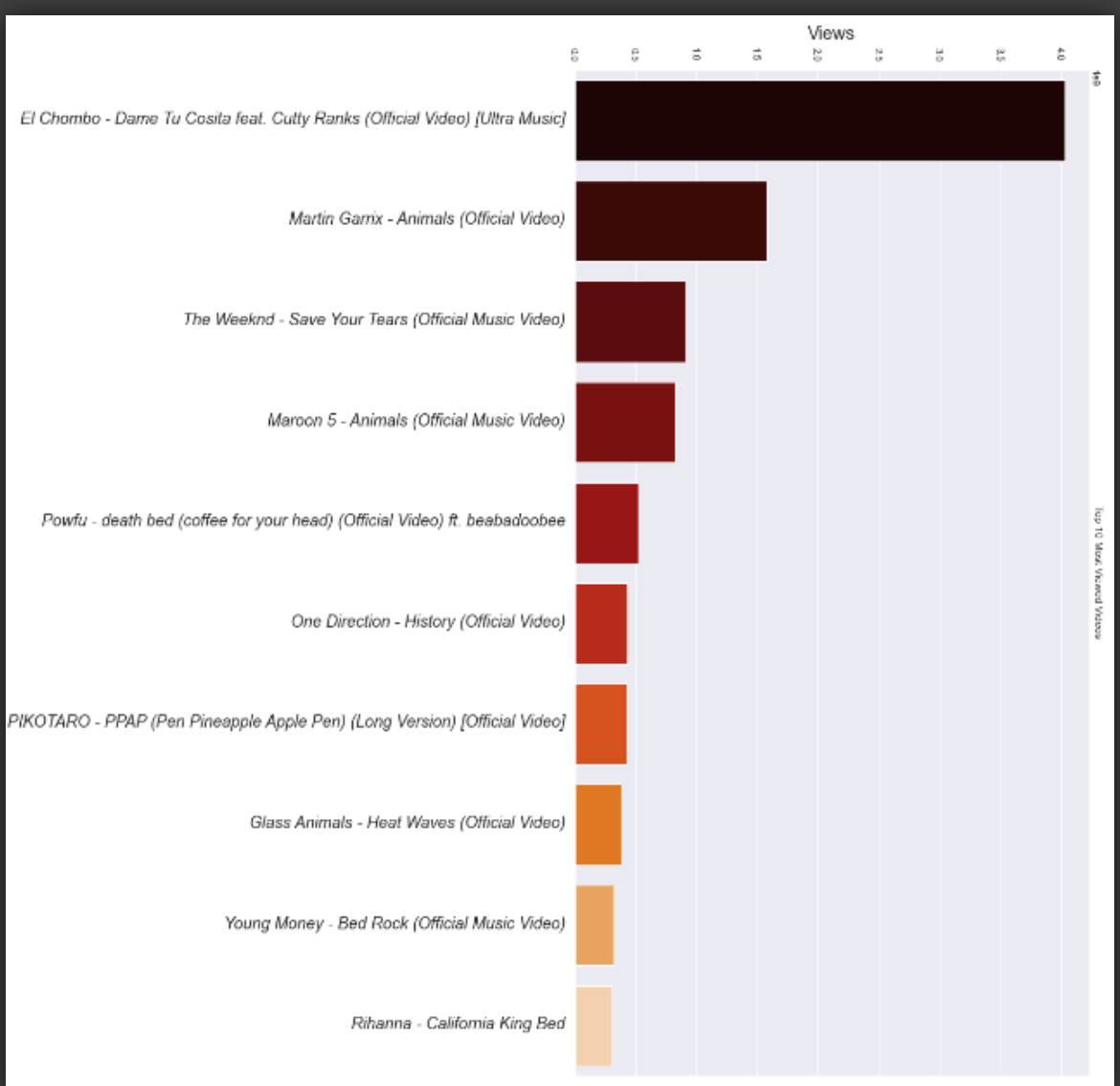
El Chombo - Dame Tu Cosita feat. Cutty Ranks (Official Video) [Ultra Music]
$456,000 Squid Game In Real Life!
Martin Garrix - Animals (Official Video)
Powfu - death bed (coffee for your head) (Official Video) ft. beabadoobee
The Weeknd - Save Your Tears (Official Music Video)
Glass Animals - Heat Waves (Official Video)
I Spent 50 Hours Buried Alive
Maroon 5 - Animals (Official Music Video)
history of the entire world, i guess
One Direction - History (Official Video)


Views
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2.5
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4.0
1e9
El Chombo - Dame Tu Cosita feat. Cutty Ranks (Official Video) [Ultra Music]
Martin Garrix - Animals (Official Video)
The Weeknd - Save Your Tears (Official Music Video)
Maroon 5 - Animals (Official Music Video)
Powfu - death bed (coffee for your head) (Official Video) ft. beabadoobee
One Direction - History (Official Video)
PIKOTARO - PPAP (Pen Pineapple Apple Pen) (Long Version) [Official Video]
Glass Animals - Heat Waves (Official Video)
Young Money - Bed Rock (Official Music Video)
Rihanna - California King Bed

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reaction
cubes
marvel
business
lofi
minecraft
mukbang
physics
how-to
tutorial
sports
sat
food
asmr
nintendo
mathchemistry
interview
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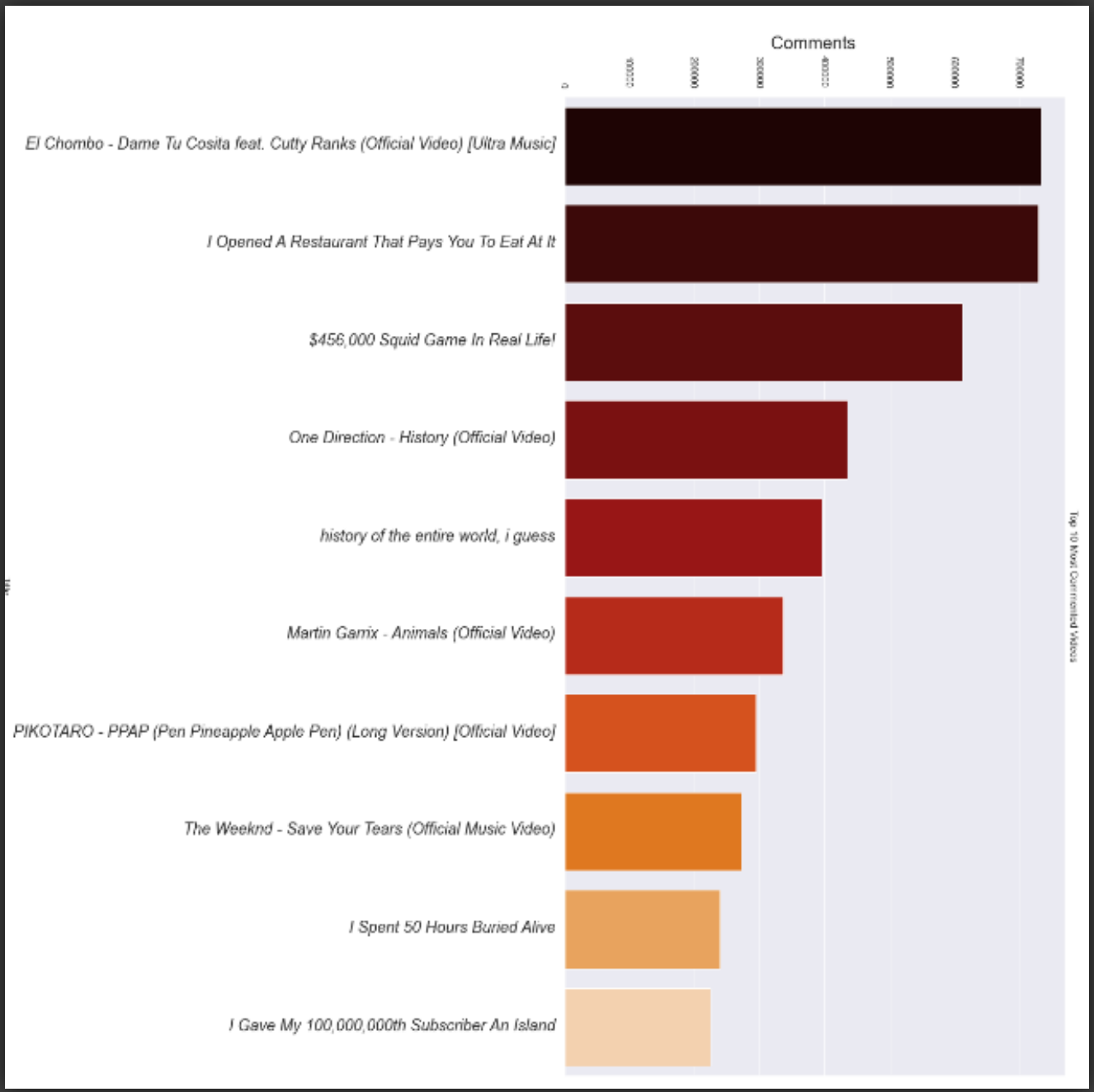
Comments
El Chombo - Dame Tu Cosita feat. Cutty Ranks (Official Video) [Ultra Music]
I Opened A Restaurant That Pays You To Eat At It
$456,000 Squid Game In Real Life!
One Direction - History (Official Video)
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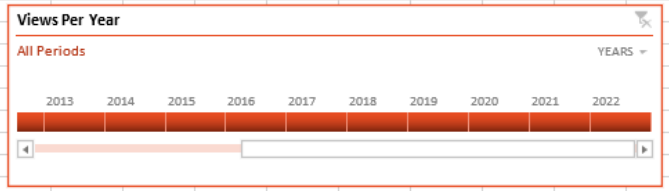
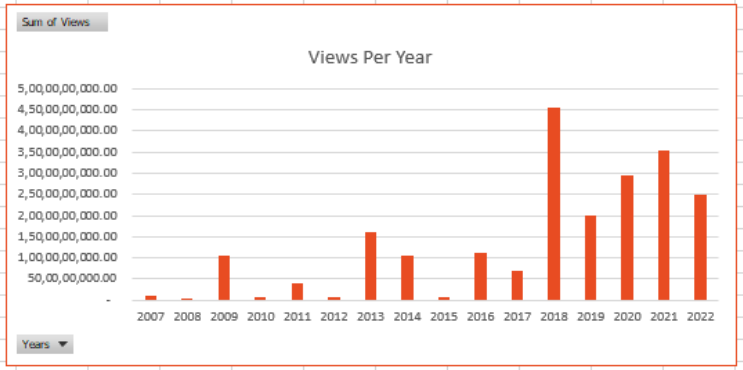
The Weeknd - Save Your Tears (Official Music Video)
I Spent 50 Hours Buried Alive
I Gave My 100,000,000th Subscriber An Island
Top 10 Most Commented Videos

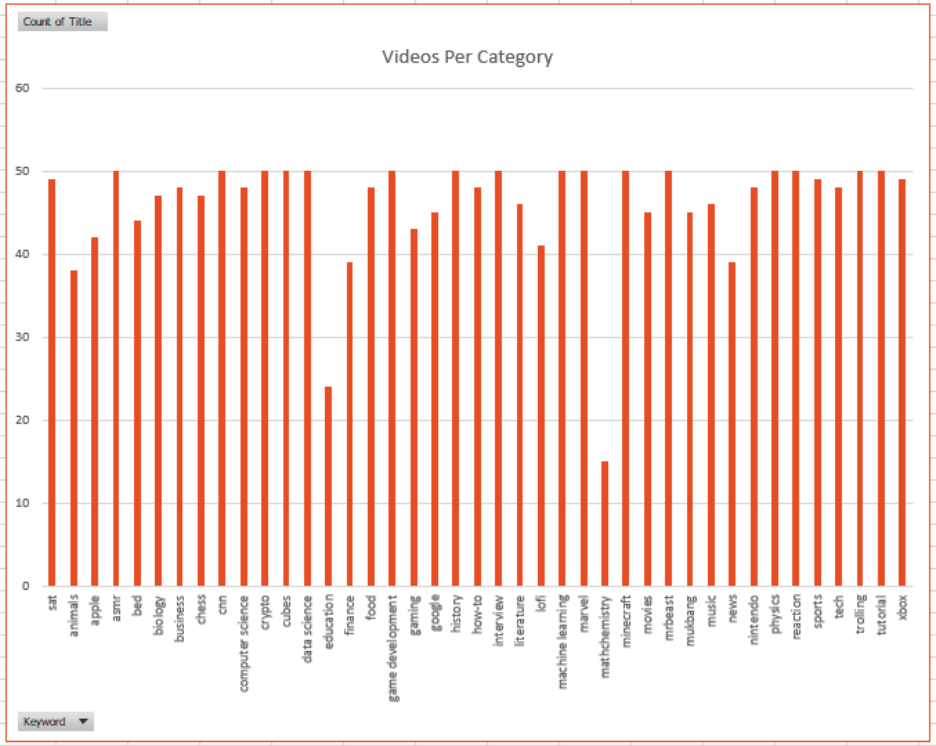
Name: **SMDash**

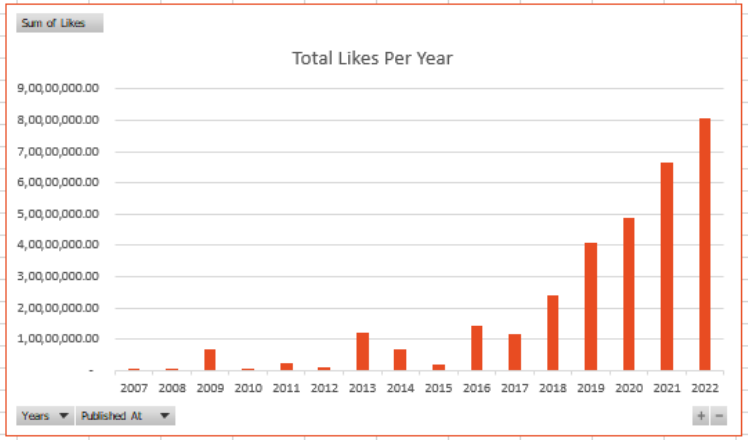
Password: **shoryadata**

YouTube Statistics









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Welcome

What?

Steps

Conclusion

Thank you!