

## **Faculty of Engineering and Natural Sciences**

## **Data Science and Social Media Analysis**

## **Term Project**

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#### API (Application Programming Interface)

API (Application Programming Interface) is an interface that provides access to the capabilities of an application, service or platform (Ex. Youtube, Twitter, Spotify, Facebook) within the allowed limitations. In this usage process, you can obtain or send the features, functions, contents offered without the need for the application itself. However, accesses have limitations to prevent abuse.

#### **API Usage**

In our own project, we used the Youtube platform, which is a video playing and sharing platform. We capture and analyze the data of 10 different channels on Youtube in json format. Then we have the opportunity to convert the data analysis we have taken to csv and make more detailed analysis.

It is a format that stores JSON structured data and is generally used for data exchange between a server and a client. This format works harmoniously so that stored data can be loaded asynchronously, meaning a website can update its information without refreshing the page. It is a very useful tool for data exchange. The advantages are;

- JSON is simpler and lighter than XML.
- It can upload information asynchronously so that your website is more responsive and can streamline data flow.
- You can use it to solve cross-domain problems when exchanging data with another site.

CSV (Comma Separated Values) is a plain text file containing a list of data. These files are often used to exchange data between different applications. Databases generally support CSV files. They mostly use the comma character to separate data, but sometimes they use other characters such as semicolons. You can export complex data from an application to a CSV file, and then import the data in that CSV file to another application. It is also used for data transfer between applications.



# 1 youTubeApiKey="AIzaSyDH9hkgyspWuByJQ-m2wHDjuWM-wndkuUY" 2 youtube=build('youtube','v3',developerKey=youTubeApiKey)

```
[22] 1 snippets = youtube.search().list(part="snippet", type="channel", q="FORMULA 1").execute()
  0
      1 snippets
       1 print("Channel "+snippets['items'][0]['snippet']['title'] +" is published at "+snippets['items'][0]['snippet']['publishedAt'])
2 print("Here is the description avaiable at the channel page on youtube \n")
3 print(snippets['items'][0]['snippet']['description'])
       Channel FORMULA 1 is published at 2005-12-29T00:34:38Z
Here is the description avaiable at the channel page of
       The Official F1® YouTube Channel - See more at www.Formula1.com.
       1 for key, value in snippets.items():
2 print(key, "**************, value)
      1 irint("Total Number of Subscribers of "+snippets['items'][0]['snippet']['title'] + " is "+stats['items'][0]['statistics']['subscriberCount'])
2 irint("Total Number of Videos Uploaded at "+snippets['items'][0]['snippet']['title'] + " is "+stats['items'][0]['statistics']['videoCount'])
3 irint("Total Number of view on all videos of "+snippets['items'][0]['snippet']['title'] + " is "+stats['items'][0]['statistics']['viewCount'])
      Total Number of Subscribers of FORMULA 1 is 4710000
Total Number of Videos Uploaded at FORMULA 1 is 3475
Total Number of view on all videos of FORMULA 1 is 2433909842
              res = voutube.playlistItems().list(playlistId = UploadId.maxResults = 50.part = 'snippet'.pageToken = nextPage token).execute()
          allVideos += res['items']
         nextPage_token = res.get('nextPageToken')
         8 if nextPage token is None:
       11 print(allVideos)
 IOPub data rate exceeded.
The notebook server will temporarily stop sending output
to the client in order to avoid crashing it.
To change this limit, set the config variable
`--NotebookApp.iopub_data_rate_limit`.
       Current values:
NotebookApp.iopub_data_rate_limit=1000000.0 (bytes/sec)
NotebookApp.rate_limit_window=3.0 (secs)
```

```
1 print("Display the information related to the latest uploaded video on the channel\n")
2 print("Title of latest video uploaded: "+ allVideos[0]['snippet']['title'])
3 print("The latest video uploaded on date: "+allVideos[0]['snippet']['publishedAt'])

Display the information related to the latest uploaded video on the channel

Title of latest video uploaded: 5 Moments You Forgot | Abu Dhabi Grand Prix
The latest video uploaded on date: 2020-12-09T16:45:00Z
```

[107]	7] 1 df=pd.DataFrame(data) 2 df											
		channelTitle	title	videoIDS	video_description	publishedDate	likes	dislikes	views			
		FORMULA 1	Mattia Binotto On The Pride And Pressure Of Le	-RviloyPxfo	The job of Ferrari team principal is arguably	2020-12- 09T15:30:00Z	1360	163	12176			
		FORMULA 1	RADIO REWIND! 2010 Abu Dhabi Grand Prix	OscqgBj1HCw	A nail biting title decider at the 2010 Abu Dh	2020-12- 09T13:00:19Z	15852	107	155802			
		FORMULA 1	Sergio Perez's Incredible Fightback From Last	L4_moYFry_s	On his 190th F1 start, Perez had been forced t	2020-12- 08T20:00:10Z	20586	116	282148			
	3	FORMULA 1	Flying Starts, Spins And The Best Onboards I 2	W6iZsl1gnDU	Enjoy the best onboard action from the first-e	2020-12- 08T18:28:31Z	10891	63	283773			
		FORMULA 1	From Highs To Heartbreak: George Russell's Ext	eglCFzxWg6U	The Briton was just 0.026s off pole position,	2020-12- 08T17:30:02Z	14517	95	278576			
	5	FORMULA 1	Top 10 Moments Of Sergio Perez Brilliance	v_1OpLmmNDo	The Mexican waited 10 years for his first ever	2020-12- 08T16:16:28Z	30214	160	460495			
	6	FORMULA 1	Why Sergio Perez Must Stay, Mercedes' Pit Stop	pjIGRGIINVM	On the newly renamed 'Perez Nation' Tom Clarks	2020-12- 08T13:01:32Z	1351		33090			
		FORMULA 1	Top 5 Formula 2 Moments I 2020 Sakhir Grand Prix	F8C1iaPdfj8	A crash in qualifying, breathtaking battles an	2020-12- 08T12:30:03Z	4085	42	91931			
	8	FORMULA 1	The Story Of Sergio Perez's Incredible Win I 2	Ou-aMmOfGio	Sergio Perez waited a long time for his first	2020-12- 07T20:06:20Z	18903	128	438179			
	9	FORMULA 1	Perez's First Win, Mercedes' Disappointment An	I4IOYEuJxvk	What a race! And now's your chance to relive i	2020-12- 07T19:00:06Z	31281	196	860835			
	10	FORMULA 1	The Drivers' Post-Race Reaction I 2020 Sakhir	HaSR1yBKIP4	We hear Sergio Perez after his maiden Formula	2020-12- 06T23:58:59Z	13324	86	407528			
	11	FORMULA 1	Grand Prix von Sakhir 2020: Rennhighlights	9b1sZmX_FMw	Ein unvergesslicher erster Formel-1-Sieg, ein	2020-12- 06T23:41:23Z	1117	42	39046			
	12	FORMULA 1	Grand Prix de Sakhir 2020: les meilleurs moments	ASQh5403qpl	Un vainqueur inédit et un premier tour de foli	2020-12- 06T23:19:38Z	422	42	17212			

```
1 channelTitle = []
2 title=[]
3 liked=[]
4 disliked=[]
5 views=[]
6 url=[]
7 videoid = []
8 publishedDate = []
9 video_description = []

[104] 1 for i in range(0,20):
2  # print(i)
3  i += 1
4  channelTitle.append((allVideos[i)]['snippet']['channelTitle'])
5  title.append((allVideos[i)]'snippet']['publishedAt'])
7  video_description.append((allVideos[i)]['snippet']['publishedAt'])
8  liked.append(int((stats[i)]'statistics']['likeCount']))
9  disliked.append(int((stats[i)]'statistics']['likeCount']))
10  views.append(int((stats[i)]'statistics']['viewCount']))
11  videoid.append(allVideos[i]['snippet']['resourceId']['videoId'])
12
13
```



[108]	1 df	sort_values	(by=['likes'],ascending=False)						I
		channelTitle	title	videoIDS	video_description	publishedDate	likes	dislikes	views
	15	FORMULA 1	2020 Sakhir Grand Prix: Race Highlights	H0zwR2drgV4	What a race! That was incredible! What started	2020-12- 06T20:40:48Z	93869	1384	3561237
	9	FORMULA 1	Perez's First Win, Mercedes' Disappointment An	I4IOYEuJxvk	What a race! And now's your chance to relive i	2020-12- 07T19:00:06Z	31281	196	860835
		FORMULA 1	Top 10 Moments Of Sergio Perez Brilliance	v_1OpLmmNDo	The Mexican waited 10 years for his first ever	2020-12- 08T16:16:28Z	30214	160	460495
	16	FORMULA 1	Sergio Perez Claims Brilliant Maiden F1 Victor	Cc2em9mj1-l	A day that Sergio Perez will never forget. On	2020-12- 06T20:34:40Z	26543	171	558442
		FORMULA 1	Sergio Perez's Incredible Fightback From Last	L4_moYFry_s	On his 190th F1 start, Perez had been forced t	2020-12- 08T20:00:10Z	20586	116	282148
	8	FORMULA 1	The Story Of Sergio Perez's Incredible Win I 2	Ou-aMmOfGio	Sergio Perez waited a long time for his first	2020-12- 07T20:06:20Z	18903	128	438179
		FORMULA 1	RADIO REWIND! 2010 Abu Dhabi Grand Prix	OscqgBj1HCw	A nail biting title decider at the 2010 Abu Dh	2020-12- 09T13:00:19Z	15852	107	155802
	17	FORMULA 1	F1 LIVE: Sakhir GP Post-Race Show	vnEBiPnN-5s	Recap all of the action LIVE from Sakhir with	2020-12- 04T13:35:04Z	15832	260	699591

Com	bining Data	
[ ]	1 import numpy as np	
0	1 import os 2 import glob 3 import pandas as pd 4 os.chdir("/content/drive/MyDrive/Course 2020-2021 - Güz/CMPE 251 - Data Science And Social Media Analysis/Term Project/CSV Files")	1
[11]	<pre>1 extension = 'csv' 2 all_filenames = [i for i in glob.glob('*.{}'.format(extension))]</pre>	
[]	<pre>1 #combine all files in the list 2 combined_csv = pd.concat([pd.read_csv(f) for f in all_filenames ]) 3 #export to csv 4 combined_csv.to_csv( "combined_csv.csv", index=False, encoding='utf-8-sig')</pre>	

```
[113] 1 data['views'].value_counts()
     90202
                2
     64316
     24750
                2
                2
     14589
     14431
                2
              1
1
     7347558
     9740552
     23287146
               1
     105836
     15164102
     Name: views, Length: 1342, dtype: int64
```

•	1 data 2 data		sv("/content/drive/MyDrive/Course 2	020–2021 – Gü	z/CMPE 251 — Data Science And Social Med	ia Analysis/Term	Project	/CSV Files	/combi <b>h</b>
<b>C</b> →	c	hannelTitle	title	videoIDS	video_description	publishedDate	likes	dislikes	views
		PewDiePie	Minecraft But I regret Everything	jLuMFyAL61Q	Minecraft harcore part 1 epic\nCheck Out New C	2020-12- 07T00:26:22Z	415717	2599	3257463
		PewDiePie	Demon Souls LIVE	ms_5N9srxX4	https://NordVPN.com/pewdiepie and use code PEW	2020-12- 06T18:37:25Z	57176	1345	1239984
	2	PewDiePie	Among Us Got Talent	pr2AgOMx5Go	Check Out New Clothing Based: https://www.base	2020-12- 03T11:59:25Z	262854	2615	3592015
	3	PewDiePie	Pewdiepie without context	FOhNXs-0dE8	Check Out New Clothing Based: https://www.base	2020-12- 02T15:10:24Z	454990	3007	4841778
	4	PewDiePie	Ranking Guys Based on Apperance	9NEhkqbRM9Y	3 Subscribe to become a FLOOR GANG Member here:	2020-12- 01T11:07:14Z	391613	2794	4725851
	1347	FORMULA 1	Perez's First Win, Mercedes' Disappointment An	I4IOYEuJxvk	What a race! And now's your chance to relive i	2020-12- 07T19:00:06Z	29610	182	770429
	1348	FORMULA 1	The Drivers' Post-Race Reaction I 2020 Sakhir	HaSR1yBKIP4	We hear Sergio Perez after his maiden Formula	2020-12- 06T23:58:59Z	13176	85	400422
	1349	FORMULA 1	Grand Prix von Sakhir 2020: Rennhighlights	9b1sZmX_FMw	Ein unvergesslicher erster Formel-1-Sieg, ein	2020-12- 06T23:41:23Z	1093		37260
	1350	FORMULA 1	Grand Prix de Sakhir 2020: les meilleurs moments	ASQh5403qpl	Un vainqueur inédit et un premier tour de foli	2020-12- 06T23:19:38Z	405	40	15946
	1351	FORMULA 1	2020 Sakhir Grand Prix: Race Hoogtepunten	bNClosXcFVk	Een memorabele eerste overwinning in de Formul	2020-12- 06T23:12:06Z	219		6441
1	1352 rows	x 8 columns							

0	1 df.	sort_values	(by=['views'],ascending=False)[:10]						
<b>C</b> ÷	channelTitle		title	videoIDS	video_description	publishedDate	likes	dislikes	views
	15	FORMULA 1	2020 Sakhir Grand Prix: Race Highlights	H0zwR2drgV4	What a race! That was incredible! What started	2020-12- 06T20:40:48Z	93869	1384	3561237
	9	FORMULA 1	Perez's First Win, Mercedes' Disappointment An	I4IOYEuJxvk	What a race! And now's your chance to relive i	2020-12- 07T19:00:06Z	31281	196	860835
	17	FORMULA 1	F1 LIVE: Sakhir GP Post-Race Show	vnEBiPnN-5s	Recap all of the action LIVE from Sakhir with	2020-12- 04T13:35:04Z	15832	260	699591
	19	FORMULA 1	F1 LIVE: 2020 Sakhir Grand Prix Build Up	vwzPjan5SRM	We're back in Bahrain for the second week and	2020-12- 04T13:33:03Z	13629	212	668102
	16	FORMULA 1	Sergio Perez Claims Brilliant Maiden F1 Victor	Cc2em9mj1-I	A day that Sergio Perez will never forget. On	2020-12- 06T20:34:40Z	26543	171	558442
	18	FORMULA 1	F2 Sprint Race Highlights I 2020 Sakhir Grand	TfOladF-YwQ	Once more unto the breach! Join us for highlig	2020-12- 06T16:01:56Z	11788	99	502332
		FORMULA 1	Top 10 Moments Of Sergio Perez Brilliance	v_1OpLmmNDo	The Mexican waited 10 years for his first ever	2020-12- 08T16:16:28Z	30214	160	460495
	8	FORMULA 1	The Story Of Sergio Perez's Incredible Win I 2	Ou-aMmOfGio	Sergio Perez waited a long time for his first	2020-12- 07T20:06:20Z	18903	128	438179

	1 data_ 2 data_		.sort_values(by = 'likes',axis =	0,ascending	= False,ignore_index=True)				
	cl	nannelTitle	title	videoIDS	video_description	publishedDate	likes	dislikes	views
		PewDiePie	bitch lasagna	6Dh-RLuN4	► Spotify: https://spoti.fi/2RO79mu \n► iTunes	2018-10- 05T13:04:23Z	11493920	872859	274347760
		PewDiePie	Congratulations	PHgc8Q6qTjc	Roomie's video: https://www.youtube.com/watch?	2019-03- 31T01:04:01Z	9624180	375940	201627283
		PewDiePie	YouTube Rewind 2018, but it's actually good	By_Cn5ixYLg	YouTube Rewind 2018. Celebrating the actual vi	2018-12- 27T14:23:38Z	9267456	115542	78759603
	3	PewDiePie	Marzia & Felix - Wedding 19.08.2019	7PIMiDcwNvc	Our footage from the wedding, best day of my I	2019-08- 23T18:30:24Z	5368059	32038	37057654
	4	PewDiePie	Unboxing 100 MIL YouTube AWARD!!	DYlesHOaPkY	ADI Get Honey for FREE and start saving money $\cdots$	2019-09- 10T13:32:44Z	4623853	145802	61974574
	347	netd müzik	Monika Bulanda - Dur	Ag8OzXhuinY	Monika Bulanda'nın, Bemol9 Müzik etiketiyle ya	2020-12- 08T12:00:03Z	178	55	5362
	348	netd müzik	Sibel Karaosmanoğlu - Kadınlar	zhnpv_N0024	Sibel Karaosmanoğlu'nun, Melodi Müzik etiketiy	2020-12- 08T11:00:16Z	154	18	3274
	349	netd müzik	Batu - İlelebet	RydkZqCz3xU	Batu'nun, 3 Adım Müzik etiketiyle yayınlanan "	2020-12- 08T14:00:07Z	144		2493
	350	netd müzik	Zparga - Baskın	iEm1yZ3TkMQ	Zparga'nın, 3 Adım Müzik etiketiyle yayınlanan	2020-12- 08T13:00:11Z	138	43	2522
	351	netd müzik	Ufuk Deniz - Aşk Meleğim	lbg57fHr1sg	Ufuk Deniz'in, Asya Müzik etiketiyle yayınlana	2020-12- 08T15:30:00Z	96		1150
13	852 rows	x 8 columns	·						

0	1 data.head()								
₽	cha	nnelTitle	title	videoIDS	video_description	publishedDate	likes	dislikes	views
		PewDiePie	Minecraft But I regret Everything	jLuMFyAL61Q	Minecraft harcore part 1 epic\nCheck Out New C	2020-12-07T00:26:22Z	415717	2599	3257463
		PewDiePie	Demon Souls LIVE	ms_5N9srxX4	https://NordVPN.com/pewdiepie and use code PEW	2020-12-06T18:37:25Z	57176	1345	1239984
	2	PewDiePie	Among Us Got Talent	pr2AgOMx5Go	Check Out New Clothing Based: https://www.base	2020-12-03T11:59:25Z	262854	2615	3592015
	3	PewDiePie	Pewdiepie without context	FOhNXs-0dE8	Check Out New Clothing Based: https://www.base	2020-12-02T15:10:24Z	454990	3007	4841778
		PewDiePie	Ranking Guys Based on Apperance	9NEhkqbRM9Y	3 Subscribe to become a FLOOR GANG Member here:	2020-12-01T11:07:14Z	391613	2794	4725851