

## Milestone 1: YouTube Data Collection and API Mastery (Weeks 1–2)

### Module-1: YouTube API Fundamentals and Video Metadata Extraction

```
!pip install requests pandas
```

```
Requirement already satisfied: requests in /usr/local/lib/python3.12/dist-packages (2.32.4)
Requirement already satisfied: pandas in /usr/local/lib/python3.12/dist-packages (2.2.2)
Requirement already satisfied: charset_normalizer<4,>=2 in /usr/local/lib/python3.12/dist-packages (from requests) (3.4.4)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.12/dist-packages (from requests) (3.11)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.12/dist-packages (from requests) (2.5.0)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.12/dist-packages (from requests) (2025.11.12)
Requirement already satisfied: numpy>=1.26.0 in /usr/local/lib/python3.12/dist-packages (from pandas) (2.0.2)
Requirement already satisfied: python-dateutil>=2.8.2 in /usr/local/lib/python3.12/dist-packages (from pandas) (2.9.0.post0)
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.12/dist-packages (from pandas) (2025.2)
Requirement already satisfied: tzdata>=2022.7 in /usr/local/lib/python3.12/dist-packages (from pandas) (2025.2)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.12/dist-packages (from python-dateutil>=2.8.2->pandas) (1.17.0)
```

```
import requests
import pandas as pd
```

```
API_KEY = "AIzaSyAfg6ifq9wubZgjvukS1LPtImImlmy2EBtEs"
CHANNEL_ID = "UCBkOVp1Cqz4MR0LYR8vKpZg"
```

```
url = "https://www.googleapis.com/youtube/v3/search"
params = {
    "key":API_KEY,
    "channelId":CHANNEL_ID,
    "part": "snippet,id",
    "order":"date",
    "maxResults":50
}

response = requests.get(url, params=params).json()

videos = []
for item in response["items"]:
    if "videoId" in item["id"]:
        video_id = item["id"]["videoId"]
        title = item["snippet"]["title"]
        published = item["snippet"]["publishedAt"]
        videos.append([video_id, title, published])
```

```
df = pd.DataFrame(videos, columns=["video_id", "title", "published_date"])
df.head()
```

	video_id	title	published_date
0	QiJYv4hHcLY	What is Virtual Ground in Op Amp ? Why Op-Amp ...	2025-12-09T17:52:45Z
1	Fk49H5xS_h0	Interesting thing about XOR and XNOR gates you...	2025-11-30T16:38:52Z
2	tWyPuCbYLUg	Solved Problems on Vectors, Vector Algebra and...	2025-11-06T15:10:54Z
3	jGoVQ6tDE3M	Vector Algebra   Vector Addition and Subtracti...	2025-11-01T05:30:07Z
4	FsS-FUDs4J4	Introduction to Electromagnetic Theory	2025-10-12T14:46:29Z

```
from google.colab import drive
drive.mount('/content/drive')
```

Mounted at /content/drive

✦ **Module 2:** Exploratory Data Analysis (EDA) and Structuring Video Metadata

```
df.to_csv("youtube_metadata.csv", index=False)
```