

**This document is an additional description of the codes I submitted.**

**Detailed information about each function and python file are written in each file.**

## **Twelve Labs – Technical Code Assignment**

**Due to security concerns, I have removed sensitive information such as my  
AWS key and MongoDB passwords from the code.**

**As a result, the code provided in Github is for reference only and cannot be  
executed successfully without the necessary credentials.**

**Therefore, I captured screenshots of the relevant results and attached them  
to this document.**

## Part 1. Configuration

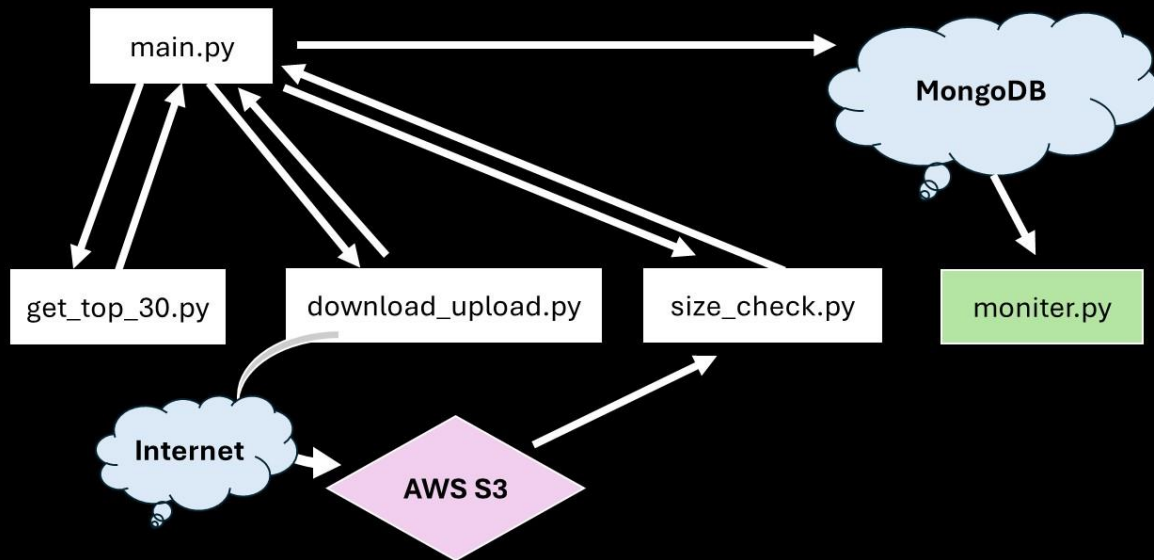


Figure 1. Flow Chart

There is total 5 Python files:

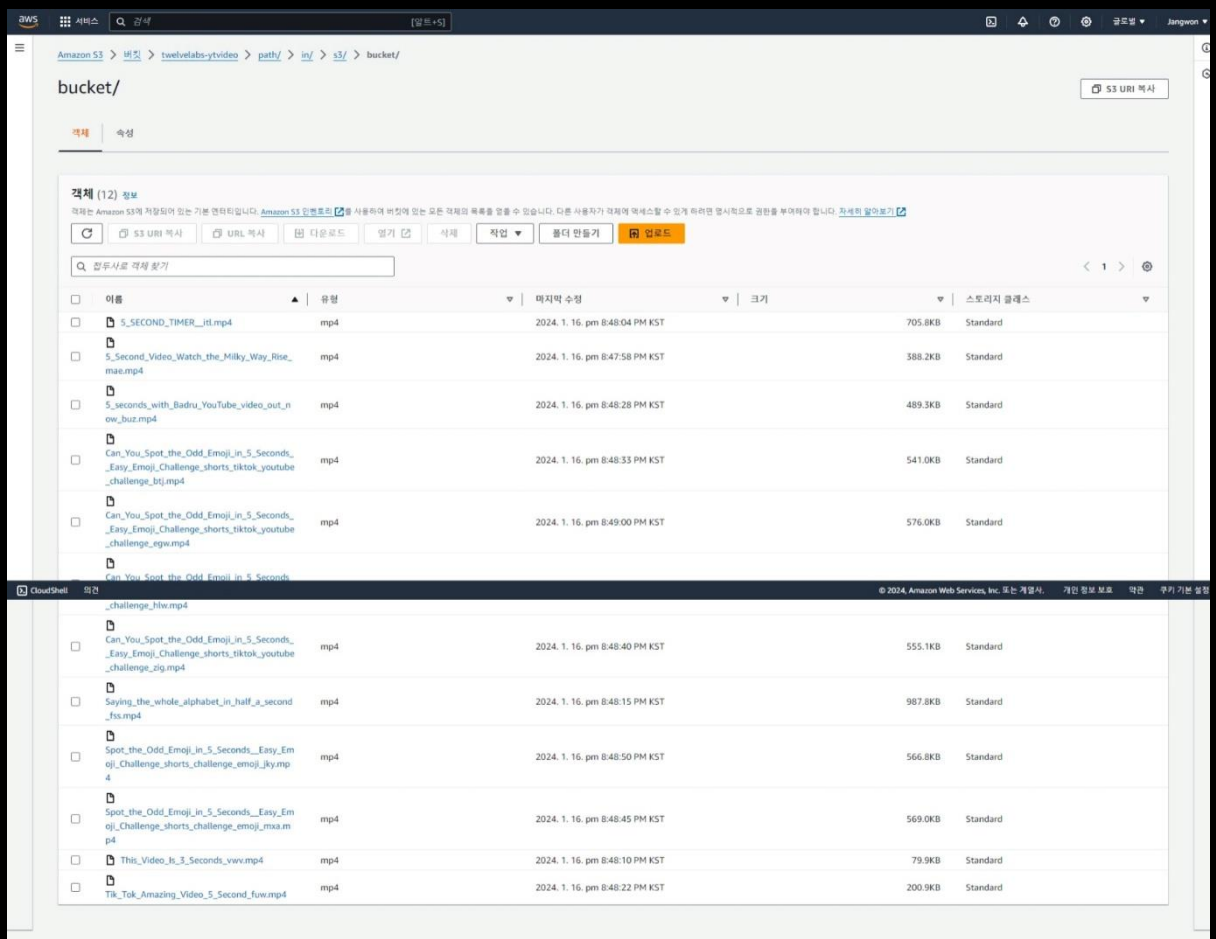
1. **main.py**
2. **get\_top\_30.py** : This function return lists of videos' name and URL, number of videos after filtering, and number of videos retrieved by query search
3. **download\_upload.py** : This function download the video, and upload it to S3 bucket.
4. **size\_check.py** : This function return the size of the video file in S3 bucket.
5. **montier.py** : This function get log data from MongoDB and print the following information.

## Part 2. Screenshot of the Result

To validate my code, I gave a query as "5seconds videos". To save AWS S3 resources, I refine time constraints from 8 minutes~12 minutes to shorter than 15 seconds to reduce the size of videos.

### ① After run main.py

#### - AWS S3 Bucket



The screenshot shows the AWS S3 console interface for a bucket named 'bucket/'. The 'Objects' tab is selected, displaying a list of 12 objects. The table columns are: Name, Type, Last Modified, Size, and Storage Class. The objects are all MP4 files with names starting with '5\_SECONDS' or 'Can\_You\_Spot\_the\_Odd\_Emoji\_in\_5\_Seconds'.

| Name   | Type | Last Modified                  | Size    | Storage Class |
|--|------|--------------------------------|---------|---------------|
| 5_SECONDS_TIMER_Hi.mp4   | mp4  | 2024. 1. 16. pm 8:48:04 PM KST | 705.8KB | Standard      |
| 5_Second_Video_Watch_the_Milky_Way_Rise_mae.mp4  | mp4  | 2024. 1. 16. pm 8:47:58 PM KST | 388.2KB | Standard      |
| 5_seconds_with_Badru_YouTube_video_out_n_ew_buz.mp4  | mp4  | 2024. 1. 16. pm 8:48:28 PM KST | 489.3KB | Standard      |
| Can_You_Spot_the_Odd_Emoji_in_5_Seconds_Easy_Emoji_Challenge_shorts_tiktok_youtube_challenge_bfj.mp4 | mp4  | 2024. 1. 16. pm 8:48:33 PM KST | 541.0KB | Standard      |
| Can_You_Spot_the_Odd_Emoji_in_5_Seconds_Easy_Emoji_Challenge_shorts_tiktok_youtube_challenge_egw.mp4 | mp4  | 2024. 1. 16. pm 8:49:00 PM KST | 576.0KB | Standard      |
| Can_You_Spot_the_Odd_Emoji_in_5_Seconds_Challenge_hlw.mp4  | mp4  | 2024. 1. 16. pm 8:48:40 PM KST | 555.1KB | Standard      |
| Can_You_Spot_the_Odd_Emoji_in_5_Seconds_Easy_Emoji_Challenge_shorts_tiktok_youtube_challenge_zig.mp4 | mp4  | 2024. 1. 16. pm 8:48:15 PM KST | 987.8KB | Standard      |
| Saying_the_whole_alphabet_in_half_a_second_ffs.mp4   | mp4  | 2024. 1. 16. pm 8:48:50 PM KST | 566.8KB | Standard      |
| Spot_the_Odd_Emoji_in_5_Seconds_Easy_Emoji_Challenge_shorts_challenge_emoji_jky.mp4                  | mp4  | 2024. 1. 16. pm 8:48:50 PM KST | 566.8KB | Standard      |
| Spot_the_Odd_Emoji_in_5_Seconds_Easy_Emoji_Challenge_shorts_challenge_emoji_mxa.mp4                  | mp4  | 2024. 1. 16. pm 8:48:45 PM KST | 569.0KB | Standard      |
| This_Video_Is_3_Seconds_vaw.mp4  | mp4  | 2024. 1. 16. pm 8:48:10 PM KST | 79.9KB  | Standard      |
| TikTok_Amazing_Video_5_Second_fuw.mp4  | mp4  | 2024. 1. 16. pm 8:48:22 PM KST | 200.9KB | Standard      |

- We can verify whether the videos retrieved through the query have been successfully uploaded.

- MongoDB screenshot

**mydatabase.mycollection**

STORAGE SIZE: 36KB   LOGICAL DATA SIZE: 4.13KB   TOTAL DOCUMENTS: 17   INDEXES TOTAL SIZE: 36KB

**Find**   Indexes   Schema Anti-Patterns 0   Aggregation   Search Indexes

**Filter** [↗](#)   Type a query: { field: 'value' }

**QUERY RESULTS: 1-17 OF 17**

```
_id: ObjectId('65a68161af0be4a489386a77')
Item: "Query_Base"
Query: "5seconds videos"
Number of Videos after filtering: 10
Number of Videos retrieved by Query search: 30
Worker_Name: "LAPTOP-HU5R4S9U_240116_5"
Number of Videos Successfully Upload in S3: 7
Time_for_Download: 27.359541177749634
```

```
_id: ObjectId('65a68161af0be4a489386a78')
Item: "Video_Base"
Video_Name: "5_Second_Video_Watch_the_Milky_Way_Rise_nag"
Video_URL: "https://www.youtube.com/watch?v=QC8iQqtG0hg"
Worker_Name: "LAPTOP-HU5R4S9U_240116_5"
Video_size: 397567
```

- Relevant logs are presented in MongoDB
- In the “Query\_Base” object, keys such as Query, Number of Videos after search, filtering, and upload, worker, as well as time for download and upload, are configured to facilitate organized data management.
- In the “Video\_Base” object, keys such as Video’s name and URL, worker, as well as size of the video, are configured to enhance structured data management.

## ✂ Verification of the functioning of multiprocessing

```
Checkpoint1 : Download the video from YouTube
Checkpoint1 : Download the video from YouTube
Checkpoint1 : Download the video from YouTube
Checkpoint1 : Download the video from YouTube
Error: NN0KCHdpkHo is age restricted, and can't be accessed without logging in.
Checkpoint1 : Download the video from YouTube
Error: UoKpplwyRc is age restricted, and can't be accessed without logging in.
Checkpoint1 : Download the video from YouTube
Checkpoint2 : Upload the file to S3 bucket
Checkpoint2 : Upload the file to S3 bucket
Checkpoint2 : Upload the file to S3 bucket
Checkpoint2 : Upload the file to S3 bucket
File uploaded successfully to twelvelabs-ytvideo/path/in/s3/bucket/5_Second_Video_Watch_the_Milky_Way_Rise_zoh.mp4
Checkpoint3 : Delete the video file from the computer
Video file '5_Second_Video_Watch_the_Milky_Way_Rise_zoh.mp4' deleted
Checkpoint1 : Download the video from YouTube
File uploaded successfully to twelvelabs-ytvideo/path/in/s3/bucket/5_SECOND_TIMER_sha.mp4
Checkpoint3 : Delete the video file from the computer
Video file '5_SECOND_TIMER_sha.mp4' deleted
Checkpoint1 : Download the video from YouTube
File uploaded successfully to twelvelabs-ytvideo/path/in/s3/bucket/The_Judges_Life_Flashed_Before_Her_Eyes_wrl.mp4
Checkpoint3 : Delete the video file from the computer
Video file 'The_Judges_Life_Flashed_Before_Her_Eyes_wrl.mp4' deleted
Checkpoint1 : Download the video from YouTube
File uploaded successfully to twelvelabs-ytvideo/path/in/s3/bucket/can_You_Spot_the_Odd_Emoji_in_5_Seconds_Easy_Emoji_Challenge_shorts_tiktok_youtube_challenge_zuw.mp4
Checkpoint3 : Delete the video file from the computer
Video file 'Can_You_Spot_the_Odd_Emoji_in_5_Seconds_Easy_Emoji_Challenge_shorts_tiktok_youtube_challenge_zuw.mp4' deleted
Checkpoint1 : Download the video from YouTube
Error: hUhhHSLIK8c is age restricted, and can't be accessed without logging in.
Checkpoint1 : Download the video from YouTube
Checkpoint2 : Upload the file to S3 bucket
```

- Given that I executed the code on a 4-core CPU, the figure shows that four videos were downloaded concurrently.

## ② After run monitor.py

```
PS C:\Users\jy121\Desktop\twelve1abs> c;; cd 'C:\Users\jy121\Desktop\twelve1abs'; & 'C:\Users\jy121\AppData\Local\Programs\Python\Python312\python.exe' 'c:\Users\jy121\.vscode\extensions\ms-python.python-2023.22.1\pythonFiles\lib\python\debugpy\adapter\..\..\debugpy\launcher' '55908' '-.' 'C:\Users\jy121\Desktop\twelve1abs\monitor.py'
```

|  |  |   |
|--|--|---|
| The number of active workers is 2  |  | ① |
| Worker   | LAPTOP-HU5R4S9U_240116_5      LAPTOP-HU5R4S9U_240116_1 |   |
| Query  | 5seconds videos      5seconds videos                   |   |
| # of Videos retrieved by Query search  | 30      30   | ② |
| # of Videos after filtering  | 10      11   |   |
| # of Videos Successfully Upload in S3  | 7      8   |   |
| Average download and upload speed for LAPTOP-HU5R4S9U_240116_5 is 0.15584366286514242 MB/s |  | ③ |
| Average download and upload speed for LAPTOP-HU5R4S9U_240116_1 is 0.2186737656241222 MB/s  |  |   |
| Video  | Worker   |   |
| 0      5_Second_Video_Watch_the_Milky_Way_Rise_nag   | LAPTOP-HU5R4S9U_240116_5                               |   |
| 1      5_SECOND_TIMER_vks  | LAPTOP-HU5R4S9U_240116_5                               |   |
| 2      The_Judges_Life_Flashed_Before_Her_Eyes_gwo   | LAPTOP-HU5R4S9U_240116_5                               |   |
| 3      Can_You_Spot_the_Odd_Emoji_in_5_Seconds_Easy_...                                    | LAPTOP-HU5R4S9U_240116_5                               |   |
| 4      Can_You_Spot_the_Odd_Emoji_in_5_Seconds_Easy_...                                    | LAPTOP-HU5R4S9U_240116_5                               |   |
| 5      Spot_the_Odd_Emoji_in_5_Seconds_Easy_Emoji_Ch...                                    | LAPTOP-HU5R4S9U_240116_5                               |   |
| 6      Can_You_Spot_the_Odd_Emoji_in_5_Seconds_Easy_...                                    | LAPTOP-HU5R4S9U_240116_5                               |   |
| 7      5_Second_Video_Watch_the_Milky_Way_Rise_zoh   | LAPTOP-HU5R4S9U_240116_1                               | ④ |
| 8      5_SECOND_TIMER_sha  | LAPTOP-HU5R4S9U_240116_1                               |   |
| 9      The_Judges_Life_Flashed_Before_Her_Eyes_wrl   | LAPTOP-HU5R4S9U_240116_1                               |   |
| 10      Can_You_Spot_the_Odd_Emoji_in_5_Seconds_Easy_...                                   | LAPTOP-HU5R4S9U_240116_1                               |   |
| 11      Spot_the_Odd_Emoji_in_5_Seconds_Easy_Emoji_Ch...                                   | LAPTOP-HU5R4S9U_240116_1                               |   |
| 12      Can_You_Spot_the_Odd_Emoji_in_5_Seconds_Easy_...                                   | LAPTOP-HU5R4S9U_240116_1                               |   |
| 13      Spot_the_Odd_Emoji_in_5_Seconds_Easy_Emoji_Ch...                                   | LAPTOP-HU5R4S9U_240116_1                               |   |
| 14      Can_You_Spot_the_Odd_Emoji_in_5_Seconds_Easy_...                                   | LAPTOP-HU5R4S9U_240116_1                               |   |

```
PS C:\Users\jy121\Desktop\twelve1abs> |
```

1. The number of active workers
2. Total number of videos after searching, filtering and uploading for each query
3. Average download and upload speed (MB/s) for each worker
4. Worker who downloaded each video