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CS 581 WS
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Assignment 3: Using the Google APIs to access YouTube Data

PURPOSE

The program youtube_api.py retrieves data from the YouTube API and processes that data to be sorted with three different analyses. The API is utilized to gather video results with the appropriate search term and call respective properties. At the completion of the program, there are two outputs: a file of raw data called output.csv and the analysis results printed in the console.

INPUT

Upon running the program, the user is prompted for a search term and a maximum number of results.

```
meghamansuria@Meghas-MacBook-Pro API3 % python3 youtube_api.py
Enter a term to search for:
christmas
Enter a maximum number of results:
7
```

OUTPUT

The output consists of a .csv file that holds the raw data for each video result. This raw data includes id, publishedAt, title, duration, viewCount, and likeCount. The other output printed in the console is the analysis results sorted by (1) newest video first, (2) highest views first, and (3) highest like percentage first.

```
meghamansuria@Meghas-MacBook-Pro API3 % python3 youtube_api.py
Enter a term to search for:
christmas
Enter a maximum number of results:
7

********** NEWEST VIDEO FIRST: **********
                title, id, date published, duration
*****************************************************************

1   3 Hours of Non Stop Christmas Songs Medley - Best Christmas Songs Ever jw8hvu_kCJg 2020-09-29T21:00:17Z PT2H51M3S
2   15 HIGH END CHRISTMAS DOLLAR TREE DIY&#39;s🎄 2020!!! nnIndHClipk 2020-09-28T12:45:01Z PT32M8S
3   LOWE&#39;S CHRISTMAS DECORATIONS CHRISTMAS TREES HOME DECOR SHOP WITH ME SHOPPING STORE WALK THROUGH sy4l3t1H4hg 2020-09-28T02:03:03Z PT11M6S
4   KOHL&#39;S CHRISTMAS DECOR CHRISTMAS DECORATIONS HOME DECOR SHOP WITH ME SHOPPING STORE WALK THROUGH y7n9UwVEH7I 2020-09-28T01:44:25Z PT8M7S
5   WALMART CHRISTMAS DECORATIONS CHRISTMAS TREES ORNAMENTS SHOP WITH ME SHOPPING STORE WALK THROUGH 25aU_GfTG6c 2020-09-27T15:10:06Z PT11M30S
6   OPENING PRESENTS BRINGS TEARS! CHRISTMAS DAY FAMILY SPECIAL! LN_sGexVLzs 2019-12-26T17:00:09Z PT48M43S
7   Mariah Carey - All I Want for Christmas Is You (Make My Wish Come True Edition) aAkMkVFwAoo 2019-12-20T05:00:11Z PT4M3S

********** HIGHEST VIEWS FIRST: **********
             title, id, date published, duration, views
*****************************************************************

1   Mariah Carey - All I Want for Christmas Is You (Make My Wish Come True Edition) aAkMkVFwAoo 2019-12-20T05:00:11Z PT4M3S 41613233
2   OPENING PRESENTS BRINGS TEARS! CHRISTMAS DAY FAMILY SPECIAL! LN_sGexVLzs 2019-12-26T17:00:09Z PT48M43S 2798034
3   15 HIGH END CHRISTMAS DOLLAR TREE DIY&#39;s🎄 2020!!! nnIndHClipk 2020-09-28T12:45:01Z PT32M8S 58202
4   WALMART CHRISTMAS DECORATIONS CHRISTMAS TREES ORNAMENTS SHOP WITH ME SHOPPING STORE WALK THROUGH 25aU_GfTG6c 2020-09-27T15:10:06Z PT11M30S 57655
5   LOWE&#39;S CHRISTMAS DECORATIONS CHRISTMAS TREES HOME DECOR SHOP WITH ME SHOPPING STORE WALK THROUGH sy4l3t1H4hg 2020-09-28T02:03:03Z PT11M6S 10741

********** HIGHEST LIKE PERCENTAGE FIRST: **********
  title, id, like percentage, views, likes, date published, duration
*****************************************************************

1   15 HIGH END CHRISTMAS DOLLAR TREE DIY&#39;s🎄 2020!!! nnIndHClipk 8.913783031510944 58202 5188 2020-09-28T12:45:01Z PT32M8S
2   LOWE&#39;S CHRISTMAS DECORATIONS CHRISTMAS TREES HOME DECOR SHOP WITH ME SHOPPING STORE WALK THROUGH sy4l3t1H4hg 2.6533842286565497 10741 285 2020-09-28T02:03:03Z PT11M6S
3   Mariah Carey - All I Want for Christmas Is You (Make My Wish Come True Edition) aAkMkVFwAoo 2.5925503072544256 41613233 1078844 2019-12-20T05:00:11Z PT4M3S
4   KOHL&#39;S CHRISTMAS DECOR CHRISTMAS DECORATIONS HOME DECOR SHOP WITH ME SHOPPING STORE WALK THROUGH y7n9UwVEH7I 2.323639905384723 7187 167 2020-09-28T01:44:25Z PT8M7S
5   WALMART CHRISTMAS DECORATIONS CHRISTMAS TREES ORNAMENTS SHOP WITH ME SHOPPING STORE WALK THROUGH 25aU_GfTG6c 1.8558667938600295 57655 1070 2020-09-27T15:10:06Z PT11M30S

meghamansuria@Meghas-MacBook-Pro API3 %
```

WHAT THE PROGRAM DOES

To begin, the program starts by asking for the user to give two inputs: the search term and a maximum number of results. In the youtube_search function, the YouTube properties are retrieved for each video result and written to a .csv file named output.csv, given the parameters of the search_term and search_max. The next three functions that are called will sort the results in their respective orders. First, the newest_first() function opens the .csv file, uses the Python method sorted() to order all the found videos by their ‘publishedAt’ property, and finally prints the analysis in the console. Second, the highest_views() function reads the .csv file and appends the rows into an array called copied_data, sorts by ‘viewCount’, and prints the next analysis. Finally, the third function highest_percentage() reads the .csv file and again, appends the rows into an array called copied_data. Then, a new key is added called ‘like_percentage’ which holds the value of (likes / views * 100). Once again, the videos are sorted according to the new key ‘like_percentage’ and are printed in the console. By the completion of the program, the two outputs are the raw data of the .csv file and the user-friendly report in the console.

ADDITIONAL INFORMATION

While working with the YouTube API, I was able to understand how to search for and retrieve the data that was required for this assignment. However, the issues that I came across were understanding how to use the .csv file for the methods of sorting. Oftentimes, I was left with empty arrays that were not holding the data from the read file, and so to solve the problem, I copied the data of the rows into an array that had the header as keys with their respective values. Another issue I had was using the Python sorted() and sort() functions, especially to order the videos by ‘viewCount’ because it was ordering the values as a string rather than an int value.