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Original Article

Youtube Data Analysis Using Python

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Abstract: *In addition to being the second-largest search engine online, YouTube allows users to upload, watch, comment on, and link to videos. With over a billion people actively using the platform, YouTube offers Recommended Channels based on user-watched videos. YouTube is becoming incredibly popular and growing. Given that the number of YouTube users is increasing daily, it has the potential to impact billions of people worldwide. Every day, about a billion videos are seen on YouTube, producing an enormous volume of data. The unstructured nature of YouTube data has led to a growing need for real-time Big Data processing, analysis, and storage.These analyses will assist in determining the YouTube performance of competitors. Finding the most popular material on YouTube is simple. This project's main goal is to determine how real-time data from YouTube may be processed to obtain the most recent findings and trends.*

Keywords: *Youtube, Python, Data Processing.*

INTRODUCTION

With 4 billion hours of video watched each month and 72 hours of video uploaded every minute, YouTube is the most popular online video platform in the world (YouTube, 2013). Jawed Karim, Steve Chen, and Chad Hurley launched YouTube in February 2005 under the domain name "YouTube.com." People began to build a website where users could publish, share, and watch videos using the YouTube platform. Since then, billions of people, including academics and educators, have viewed videos on YouTube. Every significant corporation is finding that data mining and analysis are essential components for identifying current trends and statistics as well as for creating marketing, planning, and business plans.

But the majority of the data that is produced is typically enormous in size and unstructured. Big Data analysis is not possible using conventional database systems and procedures. Many new tools that use parallel processing are being implemented in these businesses to address this problem. We would like to analyze YouTube data as part of the Advanced Databases Project. We took data from the YouTube API pertaining to video records and ran statistical analysis on it to gain insight into current trends and user activity on YouTube in relation to categories and years. Using Google Colaboratory, data analysis and visualization were completed. In the past, structured data analysis has had great success. Nonetheless, the examination of extensive unorganized data in the type of videos continues to be a difficult field. With billions of views and more than a billion users, YouTube is a Google enterprise.

Because YouTube data is being created at an incredibly fast rate and in vast quantities, there is a strong need to store, analyze, and thoroughly examine this massive amount of data in order to make it useful. The amount of information gathered is growing because it is being gathered from more and more sources, including antennas, software logs, frequency identification readers, cameras, microphones, mobile information devices, and wireless sensor networks. Since the 1980s, information storage capacity has doubled every 40 months thanks to global technology; as of 2012. Information is produced daily at a pace of roughly 2.5 trillion.

OBJECTIVE

To analyze the performance and trends of YouTube videos over a predetermined time period within a particular industry or specialty in order to pinpoint the main variables affecting viewing, engagement, and subscriber growth. The goal is to improve audience engagement, optimize content strategies, and ultimately raise the overall efficacy of YouTube channel management by utilizing data-driven insights. Engagement rates to give channel management and content producers useful information.

METHODOLOGY

Determine the Issue:

Finding current issues is the first step in the research process. The Trending YouTube Videos dataset,

which includes data from the United States, Great Britain, South Korea, and Japan, is the subject of the authors' analysis and visualization.

Choose the Approach to Be Taken:

The authors decide on the approach to be taken after identifying the problem. Data visualization will be the approach taken. Quantitative data can be visually represented using data visualization in schematic or diagrammatic formats, such as tables, scatter plots, line charts, pie charts, histograms, and more, with or without axes.

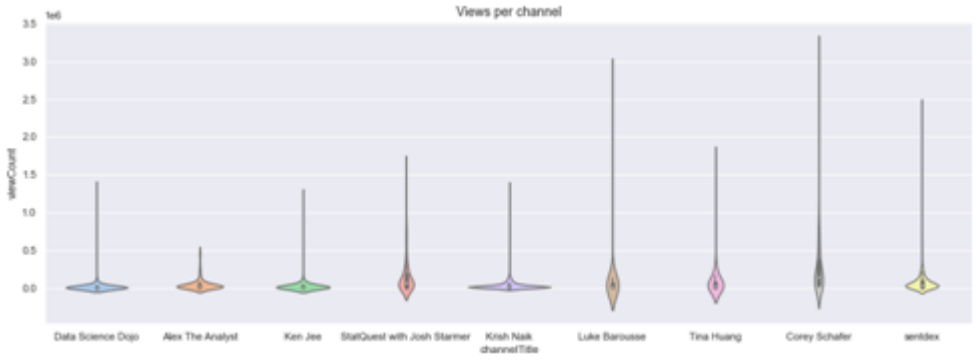
Data Collection:

The writers first decided on the best approach before beginning to gather data. The Trending YouTube Videos dataset, which is sourced from Kaggle.com, was utilized by the writers.

- IdentifytherelevantdatapointsfromtheYouTubeAPIthatcorrespondtoyourresearchquestions.
- Choose the appropriate API methods to collect the desired data. This may involve filtering data by channelID,videoID,daterange,orotherparameters.
- Utilizeappropriatedatacollectiontoolsorlibrariesdependingonyourprogramminglanguage.
- EnsureyouadheretoYouTubeAPIquotas andratelimitstoavoiddisruptions.

Data Selection:

The next step is to choose the data. Currently, the information will be chosen. Video titles, channel names, published times, tags, views, likes, dislikes, descriptions, and the quantity of comments are among the input variables.



Data processing:

The next step that comes after all the relevant data have been chosen. Currently, Tableau will be used to process the data, transforming or changing the values of the data attributes into the relevant data so that data visualization can be performed on the data. After obtaining the entire dataset, the following step of processing will be carried out.

Testing Information:

Data testing, which assesses whether a test is appropriate for use or not, will take place at this point using the data. The writers can move on to the next phase if the test yielded results that satisfied their requirements. If, on the other hand, the test fails to yield an output that satisfies the requirements, we must go back to the data processing stage; if it has progressed to the repeat or failure stage, data processing analysis is required to

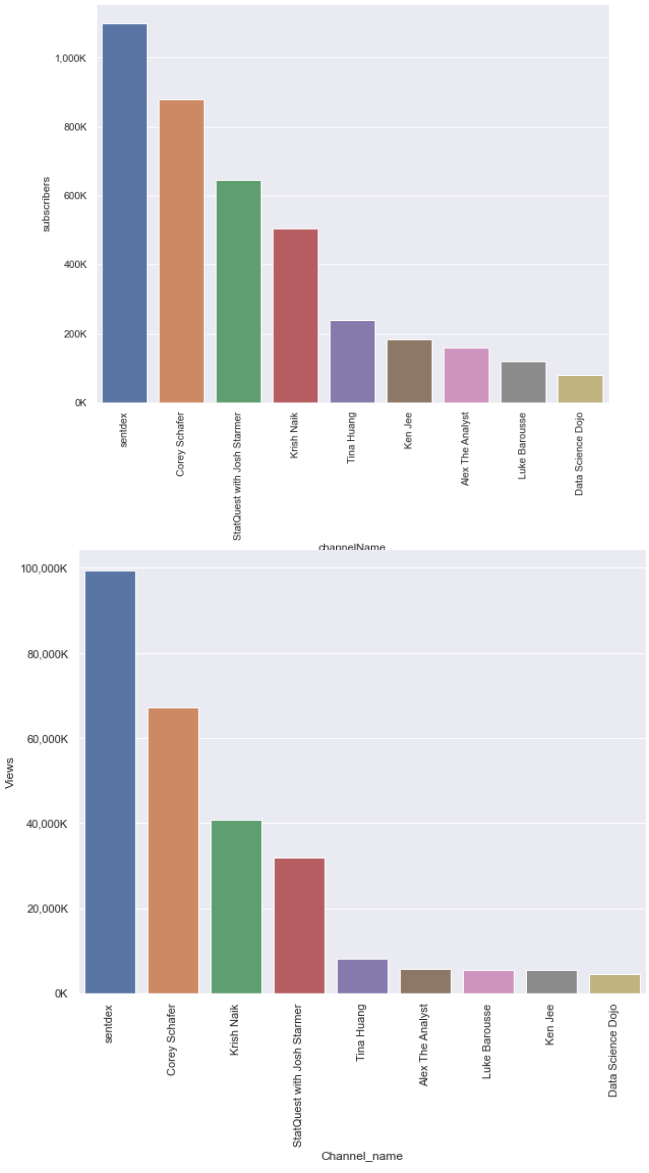
resolve the issue.

PROPOSEDSYSTEM

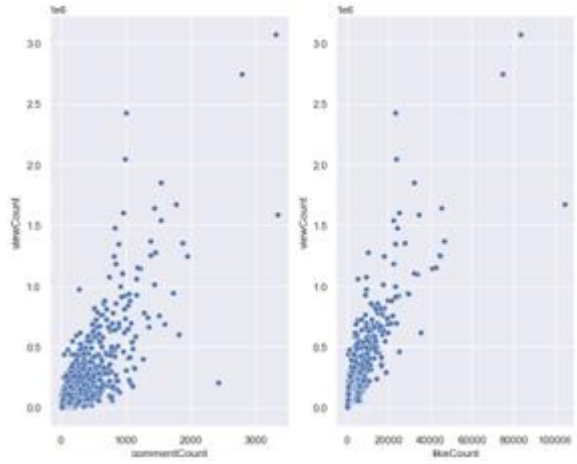
The primary emphasis of the suggested system is on category prediction and YouTube views. We use the Random Forest Regressor to anticipate the YouTube views by taking into account the video's tags. Furthermore, we forecast the categories associated with the specified YouTube video titles. We examine the data to provide the content producers with additional insights that will be beneficial to them.We imported the necessary packages and used the Kaggle dataset. There are 16 columns and 82430 rows in the data set. In addition to our dataset, we have a JSON file with video categories. However, the names of the categories are not present in the dataset that was obtained, so we extracted the categories, added an additional column to the data set, and provided the categories by connecting the category id for each row. We extracted significant information from the YouTube dataset using the category column, and we then displayed the resulting data to present some significant findings.

RESULTS

The YouTube video data, including views, likes, comments, and meta data, was successfully acquired by the project. Trending themes, viewer engagement, and video performance were all disclosed by the dataanalysis.



Analyzed the performance of videos based on metrics such as views, watch time, likes, and comments. Identified top-performing videos and content categories.



Audience Demographics:

studied the age, gender, geography, and hobbies of the audience to determine how the channel's viewership is composed.

Engagement Metrics:

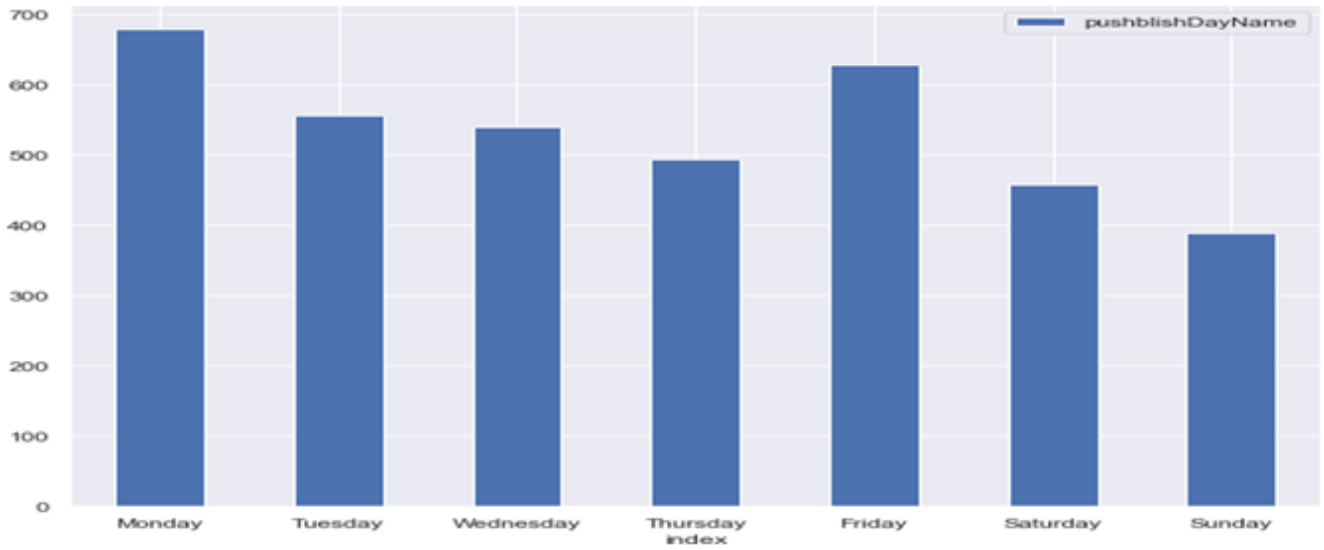
looked into engagement metrics to determine how the audience interacted with the content, including likes, comments, shares, and subscriber growth rate.

Trend Analysis:

Discovered new themes and trends that appeal to the audience, offering chances to provide interesting and pertinent material.

Competitive Analysis:

Conducted a comparative analysis with competitor channels to benchmark performance and identify areas for improvement.



CONCLUSION

A video receives more views in proportion to the number of likes and comments it receives (although this is merely a correlation that can go either way). It appears that likes are a more reliable gauge of interaction than comments, and that the quantity of likes follows the "social proof" theory, which holds that the more views a video receives, the more people will find it appealing.

Most videos have five to thirty tags:

- The titles of the most popular videos often contain between 30 and 70 characters. Too long or too short of a title seems to reduce views.
- Typically, videos are posted on Mondays and Fridays. Sundays in particular are not a popular day for new video posts on the weekends.
- While most comments on videos are positive, we did observe a number of "please" statements, which may indicate that there are any content shortages in the market that may be supplied.

FUTURE RESEARCH

- To expand and build on this research project, one can: Expand the dataset to also smaller channels in data science niche
- Do sentiment analysis on the comments and find out which videos get more positive comments and which videos get less positive comments?
- Do market research by analyzing questions in the comment threads and identifying common questions/ market gaps which could potentially filled Conduct this research for other niches(e.g. vlogs or beauty channels), tocomparedifferentnicheswitheachothertoseethedifferentpatternsinviewershipandvideocharacteristics.

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