ED-COUNSELOR

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ABSTRACT

Open education is a philosophy about the way people should produce, share, and build on knowledge.Proponents of open education believe everyone in the world should have access to high-quality educational experiences and resources, and they work to eliminate barriers to this goal. Such barriers might include high monetary costs, outdated or obsolete materials, and legal mechanisms that prevent collaboration among scholars and educators.Ed-counselor mainly focuses on providing courses for the student using open source technology to choose the best suitable course for the student.Student can analyze and choose the best course for them depending on the requirement and the need.Ranking of the courses can be made based on the regional language and the knowledge level of the student from beginner to advanced using YouTube Data API.

I INTRODUCTION

Ed-counselor is a java application that is used to suggest student's top-rated Youtube Videos available on the internet to make that possible it uses keyword categorization, like count, video analytics to determine the best-suited video for a student. It's a java application integrated with API to get the data. Classifying the videos as educational and non-educational helps students to focus on learning. It gives the recommendation to the student based on their process it might be a future enhancement. It focuses on providing courses for the student using open source technology to choose the best suitable course for the student. The student can analyze and choose the best course for them depending on the requirement and the need. The ranking of the courses can be made based on the regional language and the knowledge level of the student from beginner to advanced using Youtube Data API. Students are not aware of the free resources available on the internet to upskill themselves. Even on the internet, there are a lot of resources available for students, but it is difficult to find the right one. Ed-counselor helps to find the suitable resource for the searched topic.This is achieved through Youtube Data API which is a way to access open data. Fetched API data is accompanied by an interactive Java Application.

IILITERATURE REVIEW

[1]YouTube Video Classification based on Title and Description Text
Author name: Gurjyot Singh Kalra, Ramandeep SinghKathuria, Amit Kumar
Publication Journal/Year : 2019 (ICCCIS)

YouTube has a library of millions if not billions of videos and keeping a track of the types of videos for effective retrieval and use can be quite difficult. YouTube videos can be classified into different classes based on the title and descriptions of the videos. To classify so many videos, an effective scalable algorithm is required. This can be achieved by using a Random Forest Classifier along with Natural Language Processing techniques like Bag of Words, Word Stemming etc. This paper also discusses method to scrape YouTube videos using packages like selenium, requests and Beautiful Soup for videos and their metadata. At the end we discuss various evaluation metrics for Random Forest Classifiers.YouTube videos can be classified using numerous techniques like classifying videos based on their content, comments on videos, and many more metrics. But these methods can be complex and time consuming[1]. Our approach to classifying videos on YouTube lies in Text Classification, more specifically title and description classification. We used the titles and descriptions of several YouTube videos to classify them into 6 categories:

- Travel
- Science and Technology
- Food
- Manufacturing
- History
- Art and Music

A better way to evaluate the accuracy of categorization models is F-1 Score using precision and recall formula.
The hurdle we faced was that YouTube search pages are dynamic in nature and we can capture only upto 20 links using python requests package.

[2] Understanding Popularity Dynamics for YouTube Videos
Author name : Marut Bisht, Mohammed Shahid Irshad,Niyati Aggarwal, Adarsh Anand
Publication Journal/Year : 2019 (AICAI)

The quality of any video defines its agility and its life cycle in dynamic environment. A video on any video sharing platform is not just a video for the uploader or platform; it is a source of revenue for them. Thereby it became imperative for the uploader to cater to maximum number of viewers. The number of view-counts shows the popularity of the video as well as gives us the estimation of the revenue generated by the video. The overall likeliness towards a video is based upon many attributes of the videos. This study deals with the understanding

and interpretation of the contextual relationship of the attributes under consideration. With data collected with respect to YouTube the interconnection among the impactful parameters has been analyzed using Interpretive Structure Modelling (ISM).Research on social media has turned into an extremely effective theme as of late. One of the exploration streams with respect to social media centers around innovation. Most scientists in social media utilize this kind of research system to examine users' behaviour on social mediaand develop services for the users using automatic intelligent. Social sciences and management perspective of social sciences is studied in the other research stream. Dissimilar to the specialized innovation based research in the second research stream; various techniques are utilized to comprehend the use of social media. Various applications of social media in information and behavioral sciences and other such fields are studied in the second kind of research stream.Examining the interrelationship of attributes that are
significant for increase in view-count.

[3] Categorization of YouTube Videos by Video Sampling and Keyword Processing
Author name : Ishwarya Ramesh, Ishwarya Sivakumar
Publication Journal/Year : Journal:2020(ICCSP)

Many students benefit from a wide variety of educational content on YouTube. It is a challenging task to watch only educational videos without any other distracting entertaining video catching our eye. Classifying the videos as educational and non-educational helps students to focus on learning without distraction. This paper describes a two-level automated mechanism to categorize videos into Educational and Non-Educational videos. The first level of classification is done by Video Processing. The feature vectors of the frames of the video are extracted using Inception V3, which are then processed using deep learning techniques. The second level of classification is done by Text Processing of the keywords available in the metadata of YouTube Videos. These keywords are used in the searching for YouTube videos. Our work brings novelty to the approach by classifying videos using both Computer Vision and Natural Language Processing techniques using the keywords from metadata. This method is faster and efficient to create a distraction-free environment where students can learn. The proposed approach has successfully classified videos into educational and non-educational.
If the video doesn't have keywords, the classification is done based on the predictions from the video processing model.

[4]A Recommender System for YouTube Based on its Network of Reviewers
Author name : Song Qin, Ronaldo Menezes
Publication Journal/Year : 2019 (AICAI)

Social network studies are becoming increasingly popular and have been applied to several fields of study such as law enforcement, marketing, spread of disease, as well as in the improvement of organizational performance. One area that is yet to be explored relates to harnessing the power of social networks as recommender systems. The idea that users may provide other users with recommendations that are more relevant than naive approaches is long known. However, the approaches currently implemented are based on the creation of simple relationships such as co-purchase of similar items. Similarly, video websites would like to suggest related videos to users to maximize the time they spend on their sites. Ergo it is crucial that sites like YouTube provide users with recommendations that are relevant to them. Moreover, given the large amount of videos on YouTube, a good recommender system may alleviate users' efforts on finding videos that interest them the most. Existing recommender systems for YouTube are typically based on finding similarities between the videos' textual features (video title or tags annotations) and matching these features to tags in the user's profiles or the videos they are currently watching. This approach is very limited because it restricts the users interests to the current theme of the video being played or the preferences in their profiles. This means that if one is watching a movie about football, it is assumed that the user would like recommendations on other videos about football. In this paper, we attempt to extract information about video relationship using a network formed from reviews left as comments in YouTube videos. We create a network of videos called YouTube Recommender Network (YRN) and use complex network analysis on this network as the basis of a recommender system. Our results show that our list of recommended videos is more diverse than the ones based on textual information. Our YRN provides diversity and captures other important characteristics such as high rating and mostviewed count.The videos are recommended to users from the highest utility value to the lowest. We are able to recommend categorized videos to user through community characteristics of our YRN.

[5]YouTube Data Collection Using Parallel Processing
Author name : Joseph Kready, Shishila Awung Shimray
Publication Journal/Year : 2020(IPDPSW).

Several studies have identified social media platforms as significant data sources to study human behaviors and gain situational awareness about various events or crises. YouTube, being one of the largest social media platforms, provides a Data API that enables data collection on YouTube channels and videos which can be used in these studies. Current sequential methods for processing YouTube Data API requests are time consuming. In this paper we developed an implementation that utilizes Python's multiprocessing to process YouTube Data API request in parallel. Our tests indicate multiprocessing improves the performance by 400%. These improvements reduce computation time through utilization of multi-threaded CPU architecture.
Our tests indicate multiprocessing improves the performance by 400%.
These improvements reduce computation time through utilization of multi-threaded CPU architecture.

[6] The Impact of YouTube Videos on the Student's Learning
Author name: Yousra Chtouki; Hamid Harroud, Mohammed Khalidi; Samir Bennani
Publication Journal/year : 2012(IEEE)

An important part of education is student's learning. Good quality education is based mainly on how well student attain the knowledge. One way to achieve that is to simplify the content and make it as intuitive as possible. This can be challenging especially for introductory computer science courses for non-computer science students. Such courses are supposed to cover a wide range of complex computer concepts such as networking, computer internal hardware, databases, operating systems and others. In this paper we are presenting the results of a study done on the use of YouTube videos to enhance students' learning. We have evaluated the student's performance in an introduction to computers course for non-computer science students by comparing two groups of students, The first one is a test group in which we have supplied the students with a set of videos from YouTube to illustrate different concepts such as multiple core versus single core processor, hard disk internal components, using fiber optic cables to connect continents under

water..ect. The second is a control group in which we have only used the traditional resources, such as the textbook, in class lectures and handouts. The results of the study have shown that students understand and can remember the complex concepts much better when they are exposed to a visual explanation video. We found that most of the students if not all watched the short videos, which is not the case with textual content. One of the main advantages of YouTube is that it is a free web based service that contains short contents about specific concepts taught in schools. Educators can easily search and review videos related to a specific concept or knowledge, and then provide the students with the link. In this study we have found that using YouTube videos encouraged students to look for similar videos, and get a habit of using YouTube as an educational resource. The only challenge is the evaluation of the reliability of the content, for that reason content selection has to done by the instructor.Lastly, YouTube videos have been a useful source of educational content, it is a free web based tool, and the impact has been important based on our study on students' performance. Educators have used YouTube videos in other fields such as nursing in [1] and have proven to be an effective tool to enhance students learning and engagement.

III IMPLEMENTATION

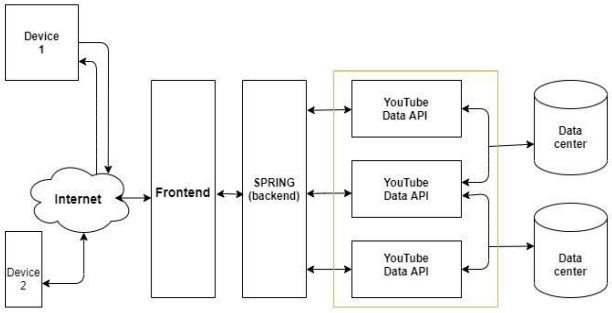

Fig.1 Architecture Diagram

Ed-counselor is a Java application created using spring framework, SQL lite and Java FX. This application is developed with light weight UI. It has various filters for providing results on any search topics. The filters include most recent, least recent video search. It also has filters for searching the entire playlist, channel and videos. This app allows you to compare videos with the help of group by tab. It shows a graph of the entire channel comments on a weekly basis. It also displays like and dislike counts for a particular video. This app has an additional feature which allows you to know the active followers of the channel and most recent followers.

PROPOSED SYSTEM

Our proposed system is made up of these following modules:

- API Integration using Youtube Data API.
- Data Collection using keyword search.
- JSON Generationfor the search result.
- Storing data in SQL Lite 3
- Stand-alone Java application
- Login created using Swing
- User Interaction to search content

3.1:APPLICATION PROGRAMMING INTERFACE

The YouTube Data API lets you incorporate functions normally executed on the YouTube website into your own website or application. The lists below identify the different types of resources that you can retrieve using the API. The API also supports methods to insert, update, or delete many of these resources.

3.2: DATA COLLECTION

Social media platforms as significant data sources to study human behaviors and gain situational awareness about various events or crises. YouTube, being one of the largest social media platforms, provides a Data API that enables data collection on YouTube channels and videos which can be used in these studies. .

There are over two billion people using social media . Their activities and contributions on social media platforms generate data that provides insights into social behaviors. These datasets are at the heart of most social science research. Improving the data collection processes for the top social media platforms lowers the barrier of entry for future research. YouTube is the second largest social media platform, where users spend on average 40 minutes a day watching and commenting on videos. All this activity generates an estimated total of 10 Exabytes of data making YouTube a treasure trove for researchers to use for novel social behavioral studies. The information collected can help researchers study information diffusion, identify digital communities and study topic/interest trends, or identify deviant users and their inorganic behaviors.

Accessing data from any social media platform using their respective API involves several steps. For example, in YouTube Data API there is json conversions, feature engineering, data storage, etc

Collect required data using Youtube Data API with keywords.

Filter the data with various options like video count, like dislike ratio etc..

Use additional filtering methods like video posted date, comments, location for better recommendation.

3.3: JSON GENERATION

JSON (JavaScript Object Notation) is a lightweight data-interchange format. It is easy for humans to read and write. It is easy for machines to parse and generate. It is based on a subset of the JavaScript Programming Language Standard ECMA-262 3rd Edition - December 1999. JSON is a text format that is completely language independent but uses conventions that are familiar to programmers of the C-family of languages, including C, C++, C#, Java, JavaScript, Perl, Python, and many others. These properties make JSON an ideal data-interchange language.

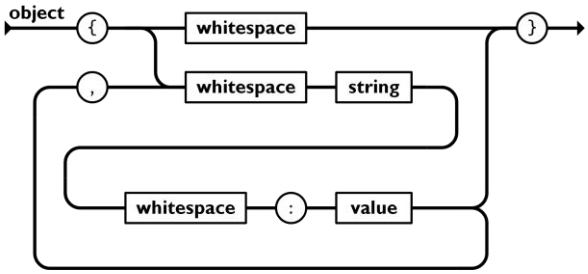

Fig.2 JSON Structure

The API allows you to integrate YouTube functionality to a website. It also gives developers access to a search.list method that supports searching of videos, playlists, and channels. The API has multiple client libraries targeting different platforms which include Android, Go, Java, JavaScript, NodeJS, .NET, PHP, Python, and Ruby.
Let's see how to perform a simple search using JavaScript in four steps:
Clone the project as outlined on the intro page, if you haven't already done so.
2.Install the http-server package in your machine globally.
$ npm i -g http-server
3.Acquire your YouTube API key using this link. Once you have acquired that, open the src/youtube-example.html file and replace undefined with your api key.

3.4: STORING DATA

SQLite is an in-process library that implements a self-contained, serverless, zero-configuration, transactional SQL database engine. The code for SQLite is in the public domain and is thus free for use for any purpose, commercial or private. SQLite is the most widely deployed database in the world with more applications than we can count, including several high-profile projects.
SQLite is an embedded SQL database engine. Unlike most other SQL databases, SQLite does not have a separate server process. SQLite reads and writes directly to ordinary disk files. A complete SQL database with multiple tables, indices, triggers, and views, is contained in a single disk file. The database file format is cross-platform - you can freely copy a database between 32-bit and 64-bit systems or between big-endian and little-endian architectures. These features make SQLite a popular choice as an Application File Format. SQLite database files are a recommended storage format by the US Library of Congress. Think of SQLite not as a replacement for Oracle but as a replacement for fopen()
SQLite is a compact library. With all features enabled, the library size can be less than 600KiB, depending on the target platform and compiler optimization settings. (64-bit code is larger. And some compiler optimizations such as aggressive function inlining and loop unrolling can cause the object code to be much larger.) There is a tradeoff between memory usage and speed. SQLite generally runs faster the more memory you give it. Nevertheless, performance is usually quite good even in low-memory environments. Depending on how it is used, SQLite can be faster than direct filesystem I/O.
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3.5: JAVA FX APPLICATION

FXML, an XML based language provided by JavaFX, to create the user interface for your Desktop application.
FXML allows you to write the user interface separate from the application logic, thereby making the code easier to maintain.

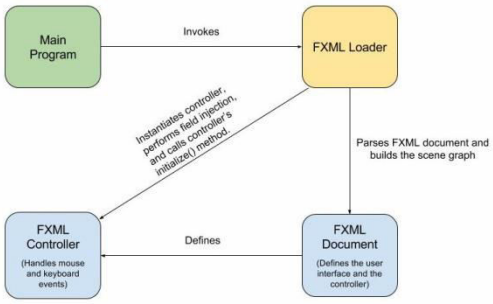

Fig.3 Java FX Structure

The execution of the program begins with the Main class, which invokes the FXML loader. The FXML loader parses the FXML document, instantiates the nodes specified in the document, and builds the scene graph.
After building the scene graph, the FXML loader instantiates the controller class, injects the fields defined in the controller class with objects instantiated from the fxml document and then calls the controller's initialize() method.

3.6: LOGIN

Java Swing provides platform-independent and lightweight components.

1.Steps in creating login form using swing:

1.1 Importing Packages
1.2 Creating a Class LoginFrame.java
1.3 Creating Object of LoginFrame class
1.4 Setting Layout Manager of JFrame
1.5 Adding Components to our JFrame
1.6 Adding Event Handling to JButtons(LOGIN,RESET) and JCheckBox(showPassword)
1.7 actionPerformed() method

Create Login database using mysql
Connect to the database using JDBC driver and connection manager.
Create a new database Login and a new table User with user parameters including user name and password.
Enter necessary entries of the user data in the Login database.
Create a GUI model containing username and password.
As user enters the username and password fetch the data in the Login database and if the details match, login is successful else login failed.
For fetching the data and executing the query use ResultSet class and PreparedStatement class for fetching the data and executing the query in the database.

JFrame and JButtons are light weight and platform-independent under the swing package.
If the data entered by the user in the login form doesn't match the database then the user is prompted with login failed.

3.7: USER INTERACTION

User interaction is created by adding additional features for searching which provides accurate search results. Various filters are provided for better recommendation. Filters like searching an entire playlist, channel videos let user to select the most accurate video for any topic.Relevant search topics along with the channel statistics are provided with graphical representation.This app allows you to compare videos with the help of group by tab. It shows a graph of the entire channel comments on a weekly basis. It also displays like and dislike counts for a particular video. This app has an additional feature which allows you to know the active followers of the channel and most recent followers.

IV. CONCLUSION

In this paper we present an we see how to create stand alone application entirely in Java with light weight components. The purpose of this project is to create an application which allows user to know the best available video on any particular search topic. It displays the top-rated videos based on the number of likes and dislikes. It also allows user to analyze the trends on a particular video. The Trends may vary from simple like count, comments and other deeper analysis on the video. It mainly focuses on providing courses for the student using open source technology(spring)to choose the best suitable course for the student with light weight UI design done using Java FX. Since this application verifies the authenticity of the user this application is developed as a stand alone web application. It can only be accessed by users having a valid YouTube API.

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