Andrew Lam

Mobile/Web Senior Lab

Period 5 Tra

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Research Proposal

RateMyTJ: Helping Students Select Their Classes

Abstract

The course catalog for TJHSST students has many flaws; certain classes display incorrect and useless information, many students have had troubles finding a certain class, and the catalog leaves out important information such as difficulty and workload of classes. This project was aimed at creating a course catalog that addresses these many issues to help TJ students find the correct class for their schedule and improve education at TJ. The data was stored in SQL Databases and the backend was built with Express.js. The front end was built with Handlebars and the table is displayed with the Datatables.js library.

I. Purpose

The current Thomas Jefferson High School for Science and Technology (TJHSST) course catalog[1] does not tell much; it only provides a basic overview of each class. It leaves out lots of crucial information about the courses, which makes it difficult for the students to select their classes. The purpose of this project is to improve the current TJHSST course catalog by displaying statistics of each course, such as workload, enjoyment, and difficulty, making it easier for students to select their classes.

II. Background

[1] https://insys.fcps.edu/CourseCatOnline/frontPanel/503/nocourselist/0/0/0/1;title=Home

Currently, the TJHSST course catalog leaves out a lot of information about the courses at the school, and some of the information listed is also incorrect. For example, the course catalog does not show the workload and difficulty of each class, which makes it harder for students who are trying to fit the right class into their schedule. Feedback about each class from previous students is also missing from the catalog. Other issues in the current catalog include uncommon course names listed which caused many people to have difficulties finding the course that they wanted. For example, Quantum Mechanics is listed as Electrodynamics on the catalog. Additionally, most classes have unspecific details about the class that leave students confused. People also found that some courses had incorrect prerequisites and corequisites listed. This project is aimed at correcting these problems and adding other details about each course to help TJHSST students choose their courses. Additionally, it will aim to improve education at TJ as it is similar to faculty course evaluations found in many colleges, and many studies have shown that these evaluations have helped “continue the development of excellence” in education for both students and faculty (Vickery 260).

2.1 - *Node.js 16.8.0*

Node.js is an efficient asynchronous event-driven JavaScript runtime environment that allows for back-end development in web applications. In Node.js, connections can be handled concurrently, which increases its efficiency. After each connection, a callback is fired, and Node.js goes to sleep after all work is done.

2.2 - *Express.js 4.17.1*

Express.js is a popular and efficient backend Node.js web application framework. It is used to design and build web applications quickly. Express.js allows

developers to write handlers for requests at different routes and inserts data into templates to generate responses.

2.3 - *Handlebars v4.7.7*

Handlebars is a simple templating language that is used to generate HyperText Markup Language (HTML) which is then rendered onto the webpage. Handlebars takes in an input object and then uses a template to then generate HTML.

2.4 - *Cascading Style Sheets (CSS) 3*

CSS is a style sheet language that formats webpages and specifies how web pages will be displayed to users. It can be used to style text, create different layouts, add effects such as animations, and other design elements.

2.5 - *Standard Query Language (SQL) 15.0*

SQL is a standard language that is used to communicate with databases. SQL commands allow developers to update, add, and retrieve data from the database.

2.6 - *DataTables.js v1.11.0*

Datatables.js is a highly flexible plug-in for the jQuery Javascript library. The library adds many advanced features to the standard HTML table, including search, filter, paginations, and sort features. The tables created by the library are heavily customizable and many extensions may be added to the table.

2.7 - *TJHSST Director*

The TJHSST Director is a website management system created for TJHSST students. It was first created in 2017 and was most recently updated in 2020, and was built with Python, Django, and Docker. Director is a secure and highly customizable hosting platform and includes a web terminal and online director.

2.8 - *OAuth 2.0*

OAuth 2.0 is the industry standard authorization framework and is used to allow web applications to obtain limited access to user accounts without sharing user credentials. OAuth 2.0 uses Access Tokens, pieces of data that represent authorization, to allow these web applications to access user data.

III. Research Method

An Express.js server will be used for the server framework for Node.js and will be used to run the backend of the web application. Multiple SQL Databases will be used to store the user's inputted information. The SQL Databases will be created with MySQL. The first SQL Database will contain the user and the classes they have inputted information in. Other SQL Databases will be separated by each class and will contain the user, their inputs, such as the amount of workload and their enjoyment in the class, the year they took the class, and the teacher they had. Express.js will be used for the server framework for Node.js and will be used to run the backend of the web application.

The project's frontend will use Handlebars to generate the webpage and use CSS to format and make the website look nice. Users will see a table displayed with the DataTables.js library that displays the courses and data when they visit the website. The table will retrieve the data stored in the SQL Databases and display them on the webpage. There will also be options that users may select that will use the DataTables.js filters to filter out results from the table. Users will also have an option to view a more detailed look at each course by clicking on the course name in the table. The more detailed view will open a new webpage that will allow students to see the historical data of each class, statistics separated by each teacher, and other written feedback by previous students. This data will also be retrieved from the data in the SQL

Databases. It will also provide a basic course overview and the class prerequisites and corequisites. Additionally, there will be a login button which allows users to authorize with their TJHSST Ion account using OAuth2. After authorizing their account, the users will have an option to input their data and/or edit their already inputted information, which will add/edit data rows into the correct SQL Databases.

A successful final project is one with a well-designed and clean working web application that allows users to view and input data about classes. It will be measured by how useful and easy to use the application is for the users. The application should contain many features for users such as sorting the classes by category and scores, and should allow users to view historical data from past school years and allow users to separate classes by teacher.

IV. Materials

- LG gram 15.6” Laptop
    - Intel Core i7-7500U
    - 16 GB Memory
    - 512 GB SSD
    - Windows 10
- Personal Desktop
    - Intel Core i5-9600K
    - 8 GB Memory
    - Radeon RX 570 Series
    - Samsung SSD 860 EVO 500 GB
    - Windows 10
- Sublime Text 4 (Build 4113)

- Visual Studio Code (1.59.0)
- TJHSST Director 4
- TJHSST Ion
- DataTables.js v1.11.0
- Node.js 16.8.0
- Express.js 4.17.1
- SQL 15.0
- OAuth 2.0
- Handlebars v4.7.7
- CSS 3
- MySQL Workbench 8.0

V. References

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"What is SQL?" *SQLCourse*, www.sqlcourse.com/intro.html.