Additional Required Submission Documents

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Programmer Documentation

Welcome to the CMD Degree Guide programmer documentation. This guide provides a comprehensive overview of the codebase structure, design principles, and the interaction between frontend and backend components.

1. Frontend (React, HTML, CSS, TypeScript, JavaScript)

1.1 Access the Site:

- HTML Structure: The landing page and navigation bar are defined in the index.html file.
- React Components: Components such as Navbar, Home, About, and ContactUs manage navigation bar functionalities.
- CSS Styling: Responsive design is achieved through separate CSS files.

1.2 Create Account and Generate a Degree Plan:

- React Components:
    - CreateAccount: Manages the account creation form.
    - MajorSelection: Implements dropdown and checklist functionalities.
    - DegreeGuidePage: Displays the generated degree plan.
- State Management: useState hooks handle dynamic updates for form inputs and course selection.
- Error Handling: Backend responses trigger error messages for user feedback.
- Link Navigation: Links guide users to additional resources based on their major.

1.3 Degree Guide Page:

- Dynamic Rendering: Courses and schedule information are dynamically rendered based on user input.
- Optional Slots: Placeholder text is used for open slots, providing flexibility for users.

1.4 Log In and View Existing Degree Plan:

- React Components:
    - Login: Manages the login form.
- Authentication: User credentials are sent to the backend for verification.
- Error Handling: Incorrect credentials trigger error messages.

2. Backend (Python transformed to JavaScript, MySQL)

2.1 Installation Instructions:

- Vercel Hosting: The application is hosted on Vercel, eliminating the need for installation.

- Development Hosting: Developers can refer to the README.md file for self-hosting during development.

2.2 Database (MySQL):

- Schema Design: Database schema includes tables for user accounts, degree guides, and major requirements.
- DAG Structure: Major requirements are stored as directed acyclic graphs (DAGs), optimizing for the generative algorithm.

2.3 Generative Algorithm:

- Topological Sort: The algorithm uses topological sorting on the DAG to determine a viable schedule.
- Efficiency Measures: The algorithm minimizes input requirements and adjusts course load per term for optimal scheduling.
- 2D Array Output: The schedule is generated as a 2D array, facilitating frontend rendering.

2.4 API Calls and Frontend-Backend Interaction:

- Express Server: The backend uses Express.js for routing and handling API calls.
- Endpoints: API endpoints are defined for user authentication, degree guide generation, and database interactions.
- Connection to Frontend: Data flows seamlessly between the frontend and backend for a cohesive user experience.

3. Code Comments

- Inline Comments: Detailed comments explain complex logic, data transformations, and key functionalities throughout the code.
- Function Headers: Each function has a header comment explaining its purpose, parameters, and return values.
- Variable Descriptions: Descriptive variable names and comments clarify their roles and data types.
- Algorithm Logic: Comments guide through the generative algorithm's steps, highlighting key decision points.

Installation Instructions

CMD degree guide is a web application. Therefore, there is no need to install anything in order to use the tool. The website can be accessed by the following link:

https://cmd-degree-guide.vercel.app/

If you would like to host this yourself for development purposes, see README.md

User Documentation

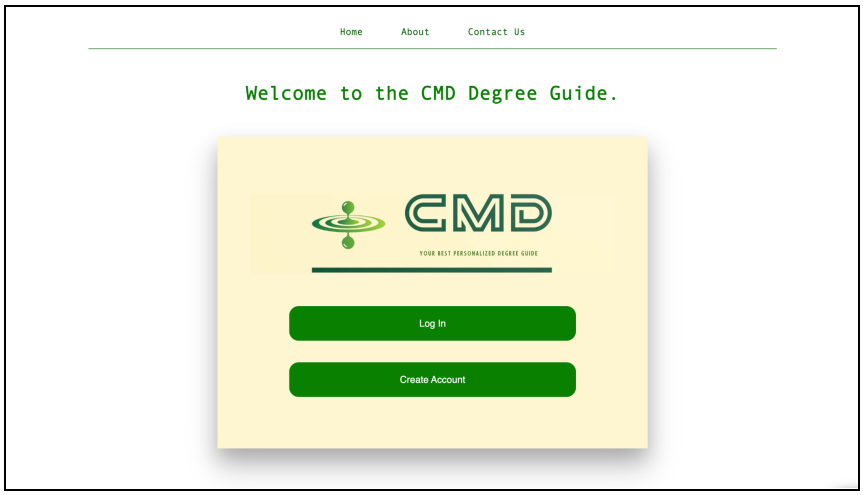
“CMD Degree Guide” Guide

Access the site

1. Open up a web browser with internet connection.
2. Copy and paste the following link into the search bar:

   https://cmd-degree-guide.vercel.app/

3. You should be presented with the landing page, which is pictured below.



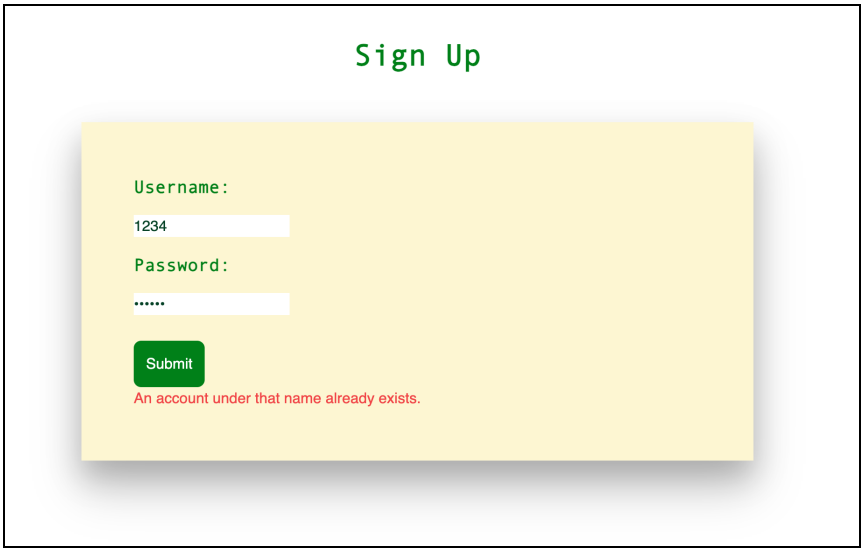
Navigation Bar Description:

Home: Brings you to the landing page.
About: Brings you to a page with a brief description of CMD.
Contact Us: Brings you to a page with contact information of the developers of CMD.

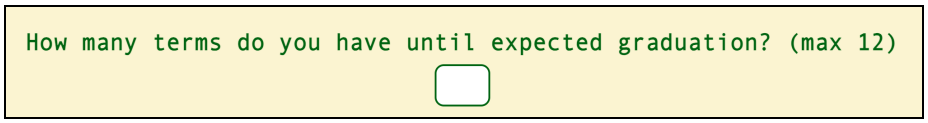
Create an Account and Generate a Degree Plan

Note: for first-time users.

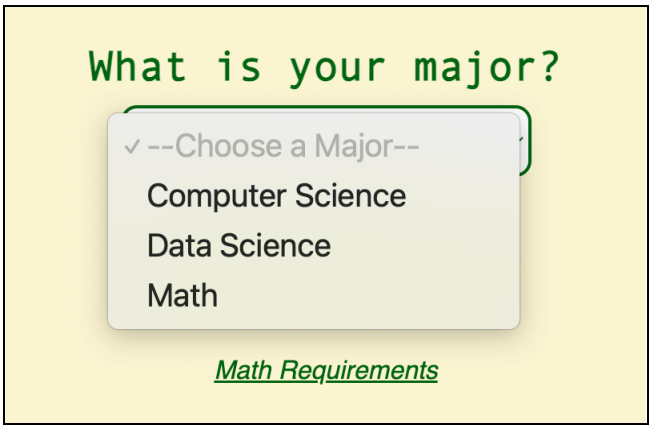
1. Once on the landing page, click “Create Account”.
2. Enter a desired Username and Password when prompted.
3. Click “Submit”. If the Username chosen is already being used for an existing account an error will pop up prompting you to try a different one- an image of this error is shown below.



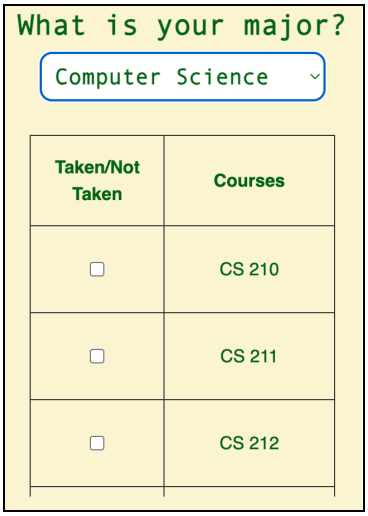
4. Enter the number of terms you have left until graduation in the first box.



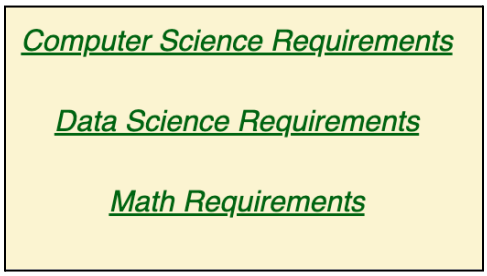
5. Select your major from the drop-down.



6. Select courses you have taken from the checklist that generates after major selection.

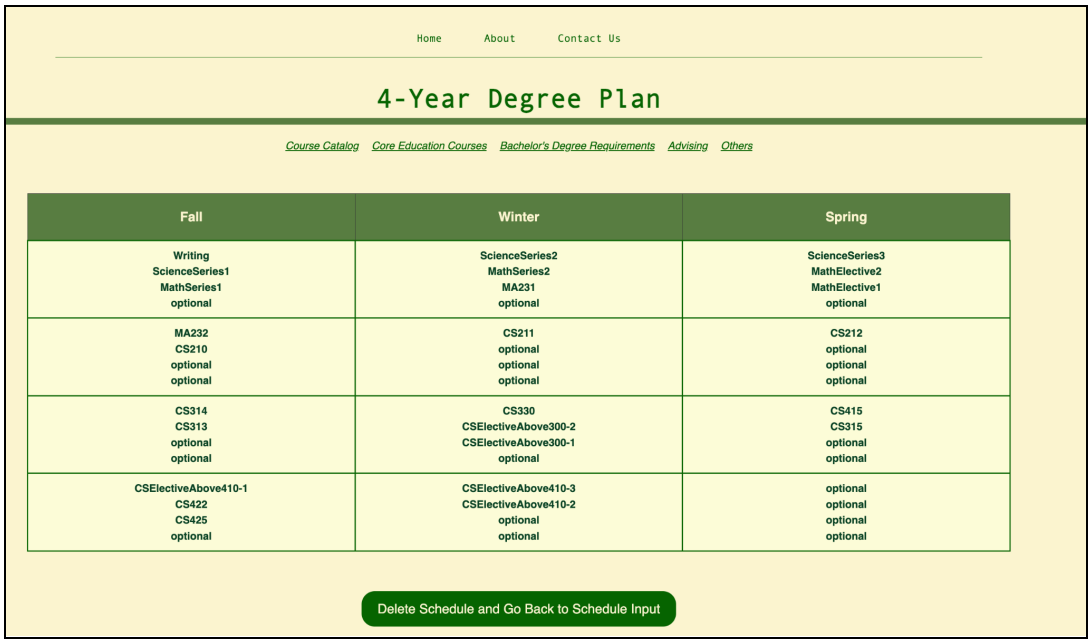


IMPORTANT → make sure you correctly select ALL courses you have taken on the checklist INCLUDING their prerequisites. If unsure about which classes are prerequisites, click the link corresponding to your major at the bottom of the page for more information.



7. Click "Submit" after you enter all the prompted information. If you cannot graduate in the number of terms you designated the following error message will display:

8. If you are able to graduate in time, you should see a page generated with your custom degree guide. It will look similar to the example image below.



Degree Guide Page Description:

"Delete Schedule and Go Back to Schedule Input": This will take you back to the previous page and let you re-input information. Allows changes to be made to the degree guide but does delete your current schedule.
Links: The links above the schedule will provide you with resources that can be helpful when planning your full schedule.
"optional": This is placeholder text for open slots in the schedule that are up to you to fill or not fill.

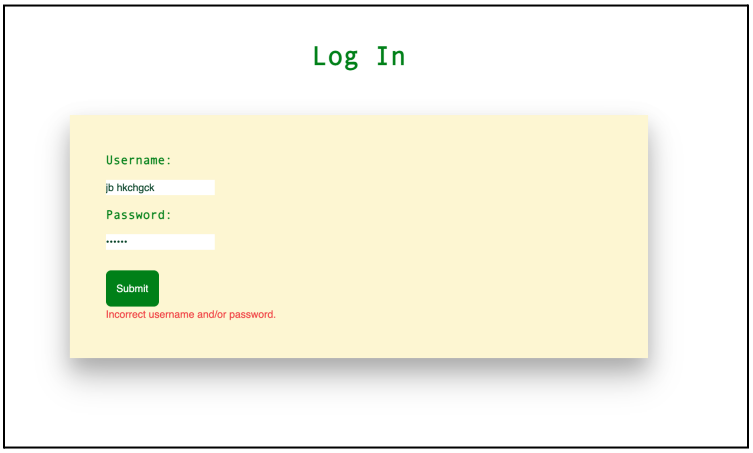
9. When finished looking at your degree plan, close out of the website whenever, and your information will be saved.

Log In and View Existing Degree Plan

Note: for returning users.

1. Open up the CMD Degree Guide webpage the same as you did upon first use.
2. Click "Log in"
3. Enter your username and password.

4. Click “Submit”. If the username and password combination is incorrect, an error message like the one in the image below will be displayed. If successful, proceed to the next step.



5. Your most recently generated degree guide will display.
6. When finished looking at your degree plan, close out of the website.