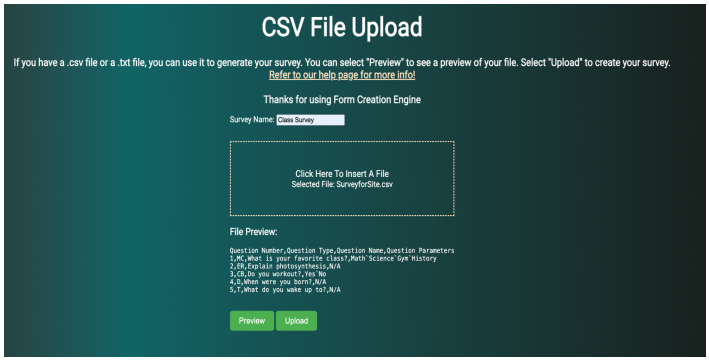
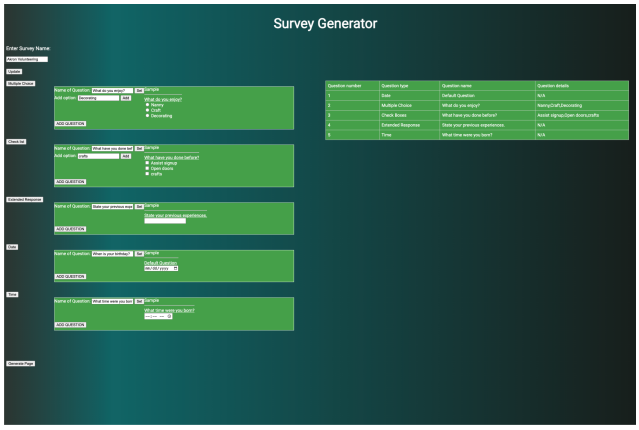
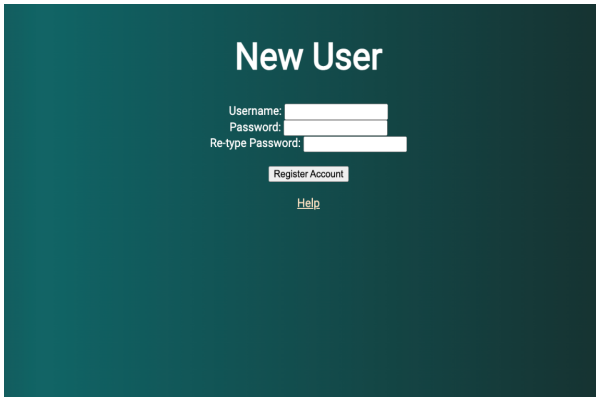
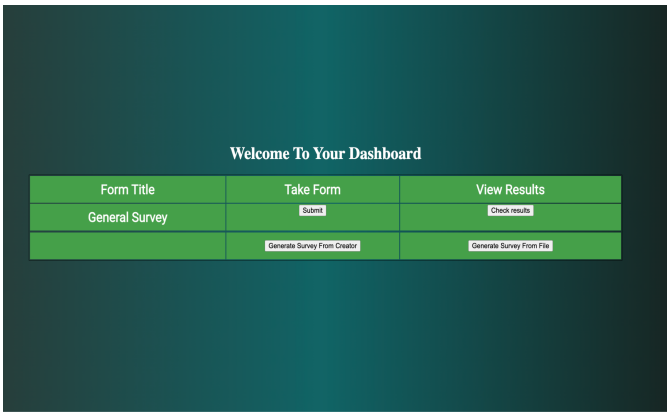
The team focused on creating a four-tier web application, called *Form Creation Engine,* that allows the user to upload or create their own survey. *Form Creation Engine* starts off by signing in the user, if they have an account with us. If not, they will have to create an account. If the user needs help or has questions, there is a link to the site help page. After a successful creation, they are directed to the login page again to login. This information is stored in a database named “users”. The logged-in user is tracked by a session ID. Once the user has been authorized by the login page, they are redirected to the main page. This page consists of a dashboard that holds the surveys the user has created, the surveys are fed in by the table “surveys”. The table on the main page has two buttons that create surveys in two different ways. If the “Generate Survey From Creator” button is clicked, the user is directed to a page that will let the user manually create their survey. They will also be able to set their survey name and see a sample of their questions. Once done, they can click on “Generate Page”, this will redirect the user to the main page, where they will see their survey. In the backend, the values (question number, question type, question parameters, and question name) are being sent to the database table “questions”. The survey name will be sent to a database table named “surveys”, the questions and names are tied by the survey ID in the database, this ID is included with the question in the “questions” table. The second option is to click “Generate Survey From File” where the user can upload a “comma separated value” (CSV) file. When this is clicked, the user will be led to a page that will ask them for the survey name and a file to be uploaded. When they click “upload”, they will receive a prompt that their file has been uploaded and will be redirected to the main page. The file’s content will also be uploaded to the database in the same way the other method sends information to the database. When a user has surveys available to them on their dashboard, they will have the ability to either take the survey or view the results. When they take their survey, that survey content will be formatted neatly, and will be ready to be used. Once a survey has been taken, the results will be in the “results” table in the database. These results can be viewed by pressing the view results button from the home page.

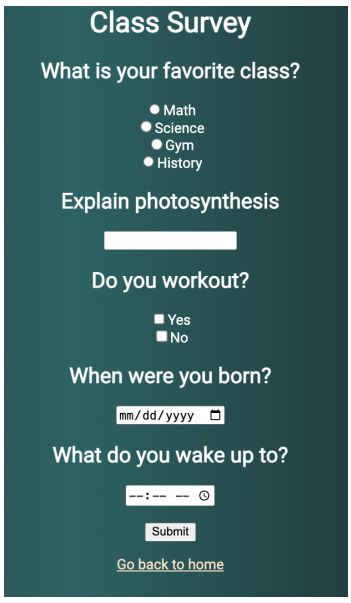
Application Screenshots:

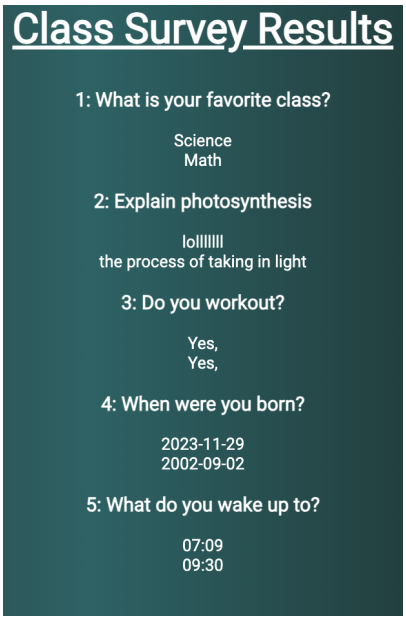


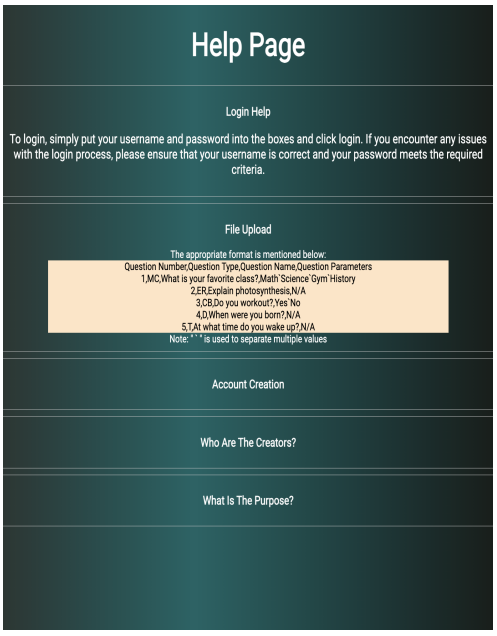












Reflection:

Through the development of this project, there was extensive use of git. The team decided to use git as source control so that we could keep track of all the progress made. If someone accidentally broke the webpage, it became easier to recover to a previous point. Learning git will be helpful outside the classroom because many employers use it.

This project was a good first introduction to creating a full scale 4 tier web application. When designing such an application, there are many design choices to make that go beyond any other school programming project. Implementing login functionality is an example of a 4 tier design feature that was built into this project. In order to make this possible, there had to be coordination between the database and the back end to ensure the user stays logged in.

Database design was another challenge for the development of this website. It became clear as soon as we started mapping out the website that the database would be a vital part of its function. All core functionality runs through the database which meant that its design was extremely important. The team built the database by constantly adapting it to the current area of development we were working on.

Many lessons can be taken from this project to future 4 tier web application development. One big lesson learned from this project was to cooperate with other programmers all working on the same project.

Contributions:

The workload for this project has been split evenly across the 3 group members. Ryan has been primarily working on building the pages to allow a user to create a new survey. He has also been creating JavaScript functions allowing for dynamic entry of inputs without server post-backs. He also designed the page to allow users to access the responses to their surveys. Josh has been working with the pages related to supporting the building and parsing of CSV files. He has also worked on styling the pages with CSS and incorporating a responsive design. He has also created the help page for new users, a page that has straightforward answers to

frequently asked questions. Connor has been working on creating a login page and setting up session variables to allow a user to stay logged in when accessing different pages. He's also been working on setting up the database to function the way we want. He also made the home page and the dynamic survey page and its respective database page.