Web Application for Aqualab Sensor Monitoring and Analysis
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Client: Dr.Turingan - Ocean Engineering and Marine Sciences

Progress of Current Milestone

Task	Completion	Greg	Haley	Ruth	To do
Implement, test, and demo *Displaying the data*	70%	0%	40%	60%	Test functionality with sensors and refine data handling.
Implement, test, and demo *Data Analysis Tools*	70%	30%	40%	30%	Test functionality with sensors and refine data handling.
Implement, test, and demo *Accessing Recorded Data*	50%	20%	60%	20%	Develop the move/delete data functionality.
Implement, test, and demo *Data Checking and Notifications*	70%	100%	0%	0%	Test functionality with sensors and additional development and testing with notification system.

Discussion of each accomplished task (and obstacles) for the current Milestone:

- Implement, test, and demo Displaying the data:
    - We have developed functions and react modules to allow the frontend and backend to successfully communicate to each other. The frontend is able to read data from the backend and display it on the user interface correctly. The Login page and user authentication functionality has been implemented and the user interface is able to display the graphs and settings on the Home page, User Settings page, and Settings page and are all accurate to the database. Changes users make to these settings via the user interface are accurately reflected in the database.
- Implement, test, and demo Data Analysis Tools:
    - The Data Analysis tool functionality was successfully implemented. The user can specify and filter the data they would like to see on a graph, the request is sent to

the backend, and the backend queries the database and sends the resulting data to the user interface to be displayed. The Data Analysis tool also calculates and displays the correlation between the amount of CO2 in the air and in the water automatically.

- Implement, test, and demo Accessing Recorded Data:
    - To ensure different parts of the system have access to the data stored in the database, we developed different create, read, update, and delete functions for clear and modular communication between the backend and frontend. The main program is able to access the database via PyMongo functions. The functionality to delete or move data to a secondary storage has not yet been developed, but it will also access the database via PyMongo functions.
- Implement, test, and demo Data Checking and Notifications:
    - We developed functionality in the main program to check the sensor value readings and send users email and/or text notifications if the readings are out of range. The check data function pulls the desired ranges for a sensor from the database and uses it to check the incoming readings. If the readings are out of range, users are alerted. The notification system framework has been implemented, but is pending completion as it needs to be tested and refined using contact information from users.

Discussion of contribution of each team member to the current Milestone:

- Gregory Thompson:
    - Reorganized the multithreading on the backend to prevent data corruption. Created a system for the server application to communicate with the backend application without data corruption. The sensor threads now individually check the values they are getting against their expected values. The framework has been developed for a notification system, but its full implementation is pending getting contact information from users. For now the out of range values are printed to the console.
- Haley Hamilton:
    - Created different create, read, update, and delete functions for the Flask app to allow the frontend to communicate with the backend. Developed React app modules to implement user interface functionality for the Home, Settings, and User Settings pages. Helped to develop the data analysis tool, specifically in ensuring data packets were sent properly from the backend and handled in the frontend.
- Ruth Garcia:
    - Created the Login page and user authentication system. Styled and maintained the user interface design through all the functionality changes and updates. Helped develop the analysis tool, specifically to ensure that data received from the backend was displayed properly for the user on the frontend.

Task matrix for Milestone 4

Task	**Greg**	**Haley**	**Ruth**

Testing and Refactoring System with Sensors and Data	40%	40%	20%
Implement, test, and demo *Move/Delete Data from Database*	20%	40%	40%
Implement, test, and demo *Data Backup in Cloud Storage*	40%	20%	40%
Implement, test, and demo *User Role Logic*	30%	30%	40%

Discussion of each planned task for the next Milestone

- Testing and Refactoring System with Sensors and Data:
    - Assuming the sensors are delivered before milestone 4, we will connect the sensors to the system and test it with real incoming sensor data. This process will entail much code refining for the different functionalities of our system, including ensuring we parse and store the data in the database correctly.
- Implement, test, and demo Move/Delete Data from Database:
    - The task includes developing the functionality to allow users the ability to delete or move sensor data stored in the database to a secondary storage.
- Implement, test, and demo Data Backup in Cloud Storage:
    - The task includes implementing and testing the system connection to a cloud storage (AWS) and the ability to periodically (i.e. every month) to backup the database to the cloud storage.
- Implement, test, and demo User Role Logic:
    - The task includes developing checks and restrictions to ensure that only users of a specific role have access to certain features and functionality. For example, it's really important that only Admin users are able to view and manage all of the users that have access to the application.

Date(s) of meeting(s) with Client during the current milestone: Tuesday, November 5th
Client feedback on the current milestone:

- We updated the client on where we are in the development process and presented them the user interface we developed in milestone 2. We discussed different aspects of the UI and modifications we could make based on their preferences, but overall they were satisfied with the UI and were looking forward to the addition of functionality.

- We continued to discuss the sensor ordering process and arrival timeline. At this meeting, the air quality and pressure sensors were ordered and pending delivery and we were working on getting the water quality sensors ordered. We set a deadline of November 22nd for all sensors to be ordered.

Date(s) of meeting(s) with Faculty Advisor during the current milestone: Communicated via email.
Faculty Advisor feedback on each task for the current Milestone:

- Implement, test, and demo Displaying the data: **satisfied**
- Implement, test, and demo Data Analysis Tools: **satisfied**
- Implement, test, and demo Accessing Recorded Data: **satisfied**
- Implement, test, and demo Data Checking and Notifications: **satisfied**

Faculty Advisor Signature: ____Dr Khaled Slhoub_____ Date: ___11/25/2024____

Evaluation by Faculty Advisor
Faculty Advisor: detach and return this page to Dr. Chan (HC 209) or email the scores to pkc@cs.fit.edu

Score (0-10) for each member: circle a score (or circle two adjacent scores for .25 or write down a real number between 0 and 10)

Gregory Thompson	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Haley Hamilton	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Ruth Garcia	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10

Faculty Advisor Signature: _____ Date: _____