Butterfly Longevity

COM S 402 Senior Design Document

Team Number: 7
Client: Nathan Brockman
Team Members/Roles:
On Wave Tiong
Richard Bach
Tze Yik Ong
Kaden Wehrenberg
Joey Jennings
Team Website: https://seniord.cs.iastate.edu/2024-Jan-07/

EXECUTIVE SUMMARY

Development Standards & Practices Used

We use SCRUM process with two weeks of sprint so that we can be efficient. We used issue board on GitLab to assign tasks to team members. We also used Git for version control.

Summary of Requirements

- Three different privileges for each type of user: admin, docent and public.
- Ability to register up to 4 new butterflies for admin and with the possibility of registering butterfly with only one hand.
- Ability to input butterfly code for all 3 users.
- Admin has the ability to submit, modify and delete data.
- Admin has the ability to generate reports.
- Admin has the ability to review data from other users.

Applicable Courses from Iowa State University Curriculum

- COM S 127
- COM S 227
- COM S 228
- COM S 309
- COMS 311
- COM S 319
- COM S 363

New Skills/Knowledge acquired that was not taught in courses

- Knowledge of how to use AWS.
- More in depth knowledge for using React.
- More in depth knowledge of using Java.
- More in depth knowledge of using JavaScript.
- Knowledge of communicating with client.

d

Table of Contents

1 Introduction <NOT TO EXCEED TWO PAGES>

1.1 Acknowledgement

We as a team would like to thank Reiman Gardens for their support during the development of our Butterfly Longevity project and for providing us with data for the database.

1.2 Problem and Project Statement

General Problem Statement: The data entry process of butterfly using pen and paper is slow and difficult to do it using one hand. The study butterfly lifespan using said data would be messy and hard to keep track. It would be impossible for only one person to keep track of the hundreds of butterflies Reiman Gardens would release into their enclosure.

General Solution Approach: The solution was to create a web app that can be accessed on a tablet device or any mobile devices. With a web app that can be accessed from a tablet device, Reiman Garden's workers would be able to register up to 4 butterflies into the app with one hand to make the process of releasing butterflies into the enclosure more efficient. Public people that visit the enclosure can also access the web app with their mobile device to help the workers keep track whether the butterflies are still alive. Admins can generate reports based on the data.

1.3 Operational Environment

Our project's end state would be a web application with no reliance on any physical component except for the device used to access the web application. The server would be maintained by the staff in Reiman Gardens.

1.4 Requirements

Summarize Functional and Non-functional requirements for your project (from your Requirements document). KEEP IT BRIEF)

Functional Requirements:

- Data Entry and Storage: Data entry is simple and efficient. The data will need to be stored in the database efficiently so it can be retrieved quickly.
- Report Generation: Data needs to be stored on the database efficiently so that it can be retrieved quickly and put into a report.
- User Creation and Admin: There will be one admin account that has the highest access, and the rest of the users will only have a user ID.

Non-Functional Requirements:

- Able to transition between pages smoothly with low response time.
- User-friendly interface that enables submission of butterfly with a single hand.
- Reliable enough to be able to work even without regular application maintenance.

1.5 Design Assumptions and Limitations

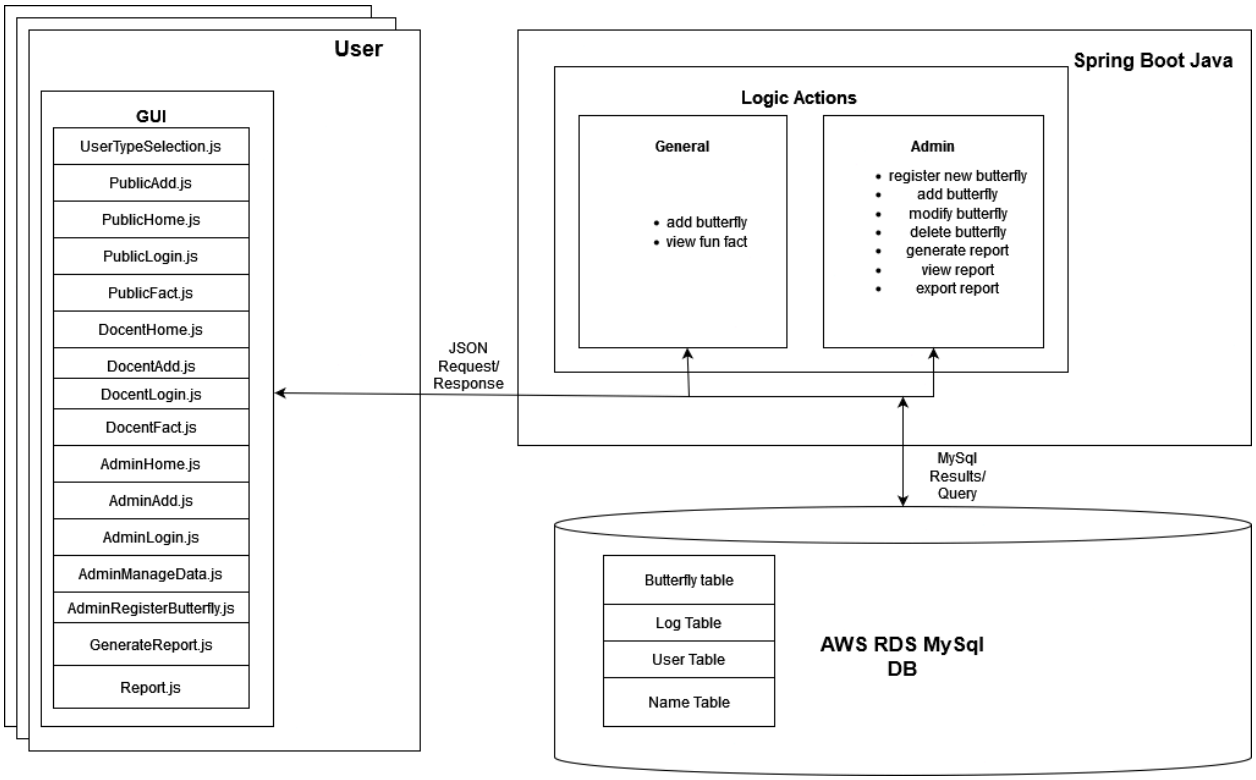
Assumptions:

- The color scheme will be Iowa State University colors.
- The web application will be used on a tablet device like an iPad.

Limitations:

- Does not have accessibility settings like multiple language.

2 Architectural Diagram << ONE TO TWO PAGES MAX>



3 Components

3.1 Component-1 : Data Entry (builds into ONE executable/process)

3.1.1 Module 1: Javascript file

- The javascript file is responsible for the basic functionality of the webpage and the layout of the webpage.
- It depends on REACT libraries for many functions and the CSS file for styling
- It has a javascript part that define the structure of the webpage

3.1.2 Module 2: CSS file

- The CSS file is responsible for the styling of each webpage.
- It depends on the Javascript file to show the styling of webpage.
- It only has CSS part where it defines the style of each webpage

3.1.3 Module 3: Spring Boot

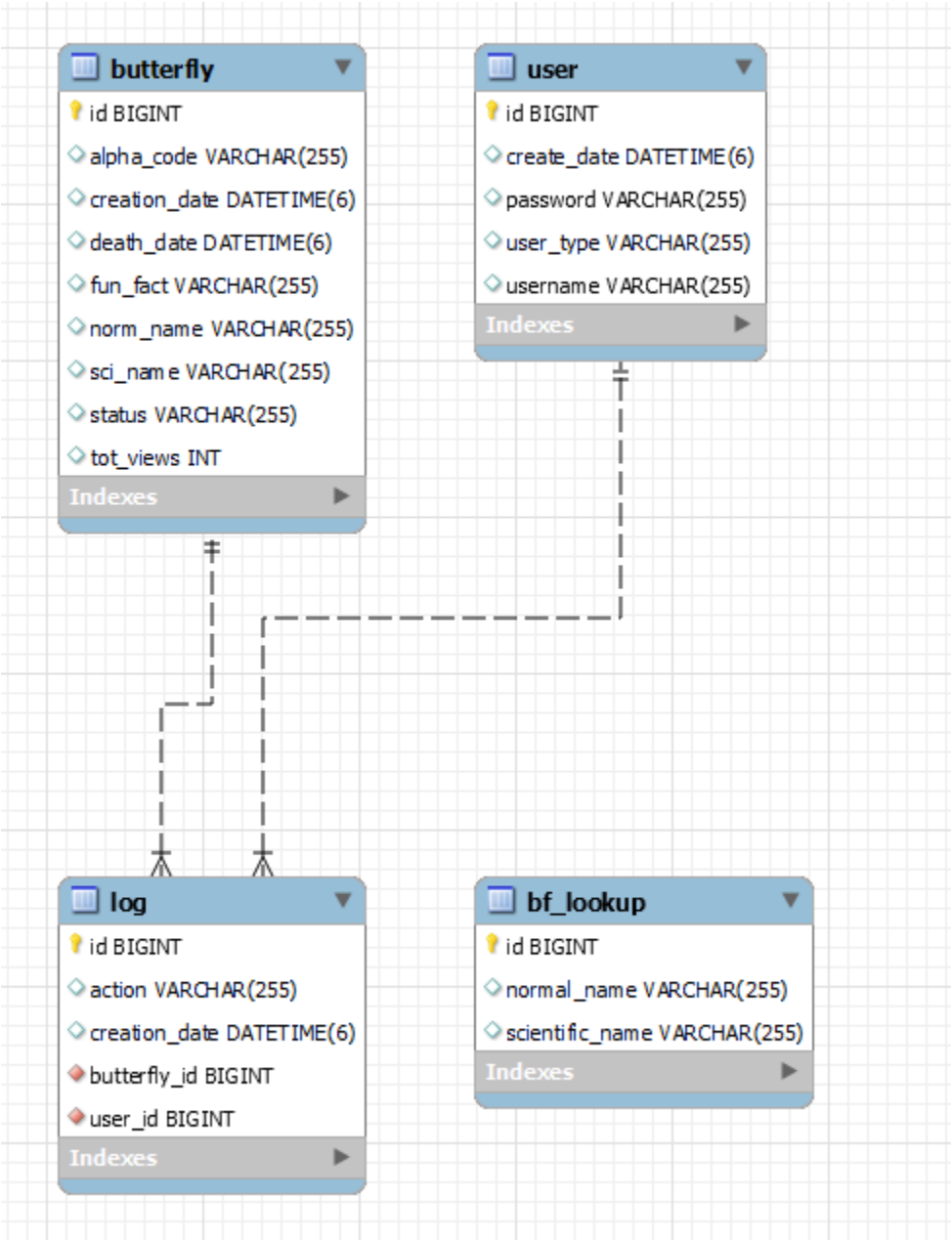
- The Spring boot files is responsible for the connection to the database.
- It has fields that correspond to the tables in the database.

3.1.4 Module 4: Database

- The database is responsible for storing data
- It depends on the Spring boot to store and retrieve user input and data.
- It has functions for executing SQL queries.

4 Data Decomposition <THREE PAGES MAX>

<Here give information on what persistent data your project stores and their relationships. Basically, describes files, tables, entity relationship etc. This is just entity-relationship diagram if you have a relational database.>



5 Detailed Design

NOT REQUIRED <Java Docs to be used instead>

Give a link to your documentation folder here.

6 Design Rationale

<Follow instructions given separately; Note that I expect this to be a **major part** of the document>

6.1 Design Issues

- The app would have to be able to be compatible with different sizes of mobile device

6.2 <Different Platform compatibility>

6.2.1 Description

Nathan wanted the web app to be mainly used on a table device which has a big screen and the webpage that public has accessed to would be commonly open on a smaller mobile device like an iPhone.

6.2.2 Factors affecting Issue

Different type of devices have different sizes of screen which the website need to be able to open and display the contents to the user.

6.2.3 Alternatives and their pros and cons

We can set up a device with the same screen size as what the workers use to submit data about the butterfly. The only pro for this is alternative that it would be easier for us to scale the website.

6.2.4 Resolution of Issue

We decide to use the REACT framework for ease to scale the webpage across different type of screen size.