

# Butterfly Longevity Project

## Demo 3 Group 7

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# Problem

- Tracking the lifespan of butterflies
- Converting a process previously dependant on paper into a web app
- Compiling collected data into a comprehensive report



## Admin uses of the webapp

- Each butterfly released into Reiman Gardens has a sticker put on it.
- That sticker contains a 3 digit Alphacode.
- Admin users are able to manage and alter the data in the database in various ways

## Admin features

- Register Butterfly
- Add species
- Access Database
- Generate report

## Report a Butterfly +

Register Butterfly

Add Species


Access Database

Generate a Report

How to read a butterfly tag:



# Register Butterfly & Add Species

mm/dd/yyyy 

☐ 1 ☐ 2 ☐ 3 ☒ 4

bEZ

Butterfly Name ▼

bFA

Butterfly Name ▼

bFB

Butterfly Name ▼

bFC

Butterfly Name ▼

Submit

## Add Species

Common Name

Scientific Name

Submit

# Access Database & Generate Report

Alphacode	Species
AAA	Yellow-edged Giant Owl   Caligo atreus
AAB	Yellow-edged Giant Owl   Caligo atreus
AAC	Yellow-edged Giant Owl   Caligo atreus
AAD	Giant Wood Nymph   Idea leuconoe
AAE	Giant Wood Nymph   Idea leuconoe
AAF	Forest Giant Owl   Caligo eurilochus
AAG	Forest Giant Owl   Caligo eurilochus
AAH	Forest Giant Owl   Caligo eurilochus
AAI	Forest Giant Owl   Caligo eurilochus
AAJ	Giant Owl   Caligo memnon
AAK	Giant Owl   Caligo memnon
AAL	Leopard Lacewing   Cethosia cyane
AAM	Leopard Lacewing   Cethosia cyane
AAN	Leopard Lacewing   Cethosia cyane

- ☒ Individual Butterfly
- ☐ Species of Butterflies
- ☐ Date Registered
- ☐ Date Butterfly Tagged
- ☐ Status
- ☐ Reported By
- ☐ Report Group

## Individual Butterfly

AAA

- ☐ How long did it live?
- ☐ How many times was it reported?
- ☐ When it was released?
- ☐ When was the last report made?

Submit

## Public uses of the webapp

- Public users log in
- Report a butterfly
- View information about reported butterfly

### Report a Butterfly +

How to read a butterfly tag:





# Backend Challenges and Issues

- Deployment - AWS EC2 pains, CORS, and NGINX
- Logging
  - Creating automatic logs based on user action
  - Anonymizing logs
- Repository querying
  - Because we have relationships between our entities, querying got very complicated for some reports



# Backend Log Repo and Deployment

JosephTJenningsx, 2 weeks ago | 2 authors (JosephTJenningsx and others)

@Repository

```
public interface LogRepository extends JpaRepository<Log, Long> {  
    // Additional custom query methods can be defined here if needed  
    List<Log> findByUser(User user);  
    List<Log> findByButterfly(Butterfly butterfly);  
    List<Log> findByAction(String action);  
    List<Log> findByCreationDateBetween(Date startDate, Date endDate);  
    List<Log> findByUser_UserType(String type);  
  
    List<Log> findByCreationDateBetweenAndAction(Date startDate, Date endDate, String action);  
  
    List<Log> findByUserOrderByCreationDateDesc(User user);  
    List<Log> findByButterflyOrderByCreationDateDesc(Butterfly butterfly);  
    List<Log> findByActionOrderByCreationDateDesc(String action);  
  
    List<Log> findByButterfly_StatusOrderByCreationDateDesc(String status);  
  
    List<Log> findByButterflyAndActionOrderByCreationDateDesc(Butterfly butterfly, String action);  
  
    List<Log> findByButterflyAndButterfly_StatusOrderByCreationDateDesc(Butterfly butterfly, String status);  
  
    List<Log> findByButterfly_SciNameOrderByCreationDateDesc(String sciName);  
  
    List<Log> findByButterfly_SciNameAndButterfly_StatusOrderByCreationDateDesc(String sciName, String status);  
}
```

```
229405 ?      00:00:00 kworker/u30:3-events_unbound  
229409 ?      00:00:00 nginx  
229410 ?      00:00:00 nginx  
229461 ?      00:00:00 systemd-userwor
```

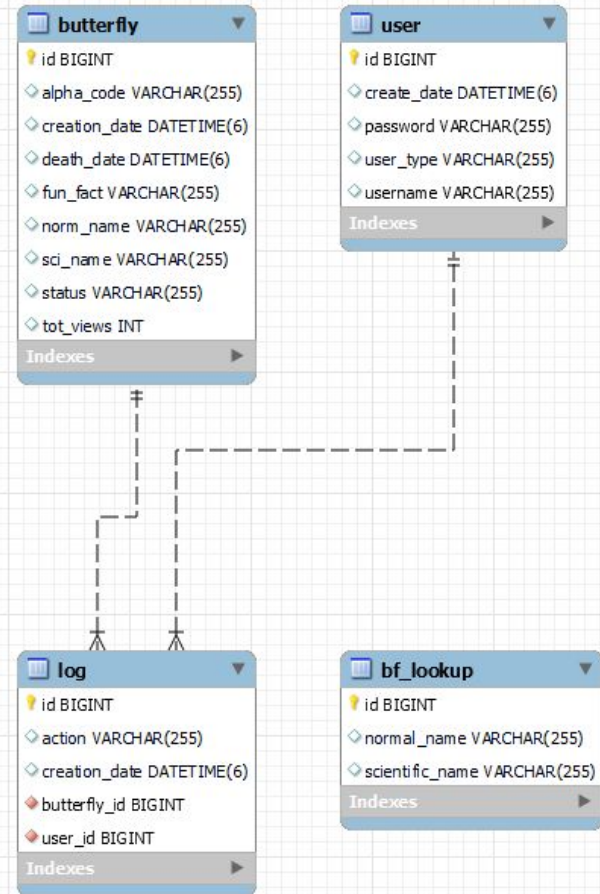
```
[ec2-user@ip-172-31-43-255 ~]$ systemctl is-active springServer  
active
```

# Backend Design Implementation

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- Spring Boot is split into controllers, services, and entities
- Deployment on EC2 running frontend on an NGINX server
  - Create a new production RDS database for the client
  - Create a systemctl service for Spring Boot server
- Have log creation be a backend feature not accessible to the frontend
- Proper querying for relationship based entities in Spring boot

# Backend ERD



# Backend API Overview

## bf-lookup-controller

GET /bflookup

POST /bflookup

DELETE /bflookup

## user-controller

GET /users/{id}

PUT /users/{id}

DELETE /users/{id}

POST /users

POST /users/login

## butterfly-controller

GET /butterflies/{id}

PUT /butterflies/{id}

DELETE /butterflies/{id}

GET /butterflies

POST /butterflies

POST /butterflies/view

POST /butterflies/alpha

DELETE /butterflies/sciName/{sciName}

## log-controller

GET /logs/{id}

PUT /logs/{id}

DELETE /logs/{id}

POST /logs/user

POST /logs/status

POST /logs/species

POST /logs/group

POST /logs/date/register

POST /logs/date/public

POST /logs/alpha

GET /logs



# Frontend Challenges and Issues

- Multiple user types (admin/docent/public)
- Admins need a way to view, manage, and export data
- Accessibility features for visually impaired users
- Variety of device types viewing web page (mobile/desktop/tablet)



# Frontend Design Implementation

- Multiple versions of screens for different user types
- Data management page to edit/delete data
- Visibility features to the data management page for ease of viewing by user
- Page to generate reports on the data collected
- Styled each page to accommodate any size viewport

## Butterfly Longevity Project

What kind of user are you?

Public

Docent

Admin

## Report a Butterfly +

How to read a butterfly tag:



## Report a Butterfly +

Register Butterfly

Add Species

Access Database

Generate a Report

How to read a butterfly tag:





# MANAGE DATA PAGE SCREENSHOTS

Filter by: 

Alphacode

 Order by: 

Oldest

Alphacode	Species	Date Register	Date Death	Status	Reported by
AAA	Yellow-edged Giant Owl   Caligo atreus	2024-04-04	2024-04-11	alive	mantisnb@iastate.ed
AAB	Yellow-edged Giant Owl   Caligo atreus	2024-04-04	2024-04-11	dead	mantisnb@iastate.ed
AAC	Yellow-edged Giant Owl   Caligo atreus	2024-04-04	2024-04-09	dead	mantisnb@iastate.ed
AAD	Giant Wood Nymph   Idea leuconoe	2024-04-04	2024-04-06	dead	mantisnb@iastate.ed
AAE	Giant Wood Nymph   Idea leuconoe	2024-04-04		alive	mantisnb@iastate.ed
AAF	Forest Giant Owl   Caligo eurilochus	2024-04-04	2024-04-14	dead	mantisnb@iastate.ed
AAG	Forest Giant Owl   Caligo eurilochus	2024-04-04	2024-04-13	dead	mantisnb@iastate.ed
AAH	Forest Giant Owl   Caligo eurilochus	2024-04-04		alive	mantisnb@iastate.ed
AAI	Forest Giant Owl   Caligo eurilochus	2024-04-04		alive	mantisnb@iastate.ed
AAJ	Giant Owl   Caligo memnon	2024-04-04		alive	mantisnb@iastate.ed
AAK	Giant Owl   Caligo memnon	2024-04-04		alive	mantisnb@iastate.ed
AAL	Leopard Lacewing   Cethosia cyane	2024-04-04		alive	mantisnb@iastate.ed
AAM	Leopard Lacewing   Cethosia cyane	2024-04-04		alive	mantisnb@iastate.ed
AAN	Leopard Lacewing   Cethosia cyane	2024-04-04	2024-04-10	dead	mantisnb@iastate.ed
AAO	Leopard Lacewing   Cethosia cyane	2024-04-04	2024-04-08	dead	mantisnb@iastate.ed
AAP	Leopard Lacewing   Cethosia cyane	2024-04-04		alive	mantisnb@iastate.ed
AAQ	Leopard Lacewing   Cethosia cyane	2024-04-04		alive	mantisnb@iastate.ed
AAR	Red Lacewing   Cethosia biblis	2024-04-04		alive	mantisnb@iastate.ed
AAS	Red Lacewing   Cethosia biblis	2024-04-04		alive	mantisnb@iastate.ed
AAT	Red Lacewing   Cethosia biblis	2024-04-04		alive	mantisnb@iastate.ed
AAU	Variable Cattleheart   Parides erithalion	2024-04-04		alive	mantisnb@iastate.ed
AAV	Forest Giant Owl   Caligo eurilochus	2024-04-04	2024-04-09	dead	mantisnb@iastate.ed
AAW	Giant Owl   Caligo memnon	2024-04-04		alive	mantisnb@iastate.ed
AAX	Forest Giant Owl   Caligo eurilochus	2024-04-04	2024-04-08	dead	mantisnb@iastate.ed
AAV	Common Blue Morpho   Morpho peleides	2024-04-04		alive	mantisnb@iastate.ed
AAZ	Ruby Spotted Swallowtail   Papilio anchisiades	2024-04-04	2024-04-08	dead	mantisnb@iastate.ed
ABA	Ruby Spotted Swallowtail   Papilio anchisiades	2024-04-04	2024-04-10	dead	mantisnb@iastate.ed
ABB	Tropical White   Aprias drusilla	2024-04-04		alive	mantisnb@iastate.ed
ABC	Yellow-edged Giant Owl   Caligo atreus	2024-04-04		alive	mantisnb@iastate.ed
ABD	Forest Giant Owl   Caligo eurilochus	2024-04-04		alive	mantisnb@iastate.ed
ABE	Tropical White   Aprias drusilla	2024-04-05		alive	mantisnb@iastate.ed
ABG	Tropical White   Aprias drusilla	2024-04-05		alive	mantisnb@iastate.ed

Export to CSV

Alpha Code:

QDF

Current Butterfly Species:

Broad Bordered Acraea | Acraea anemosa

Update to New Species:

Butterfly Species

Status:

alive

Creation Date:

2024-04-24

mm / dd / yyyy

Death Date:

mm / dd / yyyy

Total Views:

2

Report Data

Reported by:

aaaaaa

Report Group:

admin

Report Date:

2024-04-24T17:04:21.081+00:00

Back

Update

Delete Butterfly

Delete Report



Logout

- ☒ Individual Butterfly
- ☐ Species of Butterflies
- ☐ Date Registered
- ☐ Date Butterfly Tagged
- ☐ Status
- ☐ Reported By
- ☐ Report Group

## Individual Butterfly

AAA

- ☐ How long did it live?
- ☐ How many times was it reported?
- ☐ When it was released?
- ☐ When was the last report made?

Submit



Logout

## Species

Blue Wave | *Myscelia cyaniris*

## How many different butterflies in the species have reports?

50

## What is the average lifespan across the species?

7 days 20 hours 15 minutes 6.46 seconds


## What is the average observations across the species?

0.12

Alphacode	Species	Date Regis
bEB	Blue Wave   <i>Myscelia cyaniris</i>	2024-05-04
bak	Blue Wave   <i>Myscelia cyaniris</i>	2024-04-30

Export to CSV

# Desktop Format



☐ 1 ☐ 2 ☐ 3 ☒ 4

**bEZ**

**bFA**

**bFB**

**bFC**

# Mobile Format

**bEZ**

**bFA**

**bFB**

**bFC**



# Software Development Practices

- SCRUM with two-week-long sprints for efficient progress
- GitLab Issue Boards to organize and divide tasks between members
- Git for version control



# Tools Used

Frontend - React

Backend - AWS, RDS MySQL, Spring, NGINX

Overall - Gitlab, Discord



# Major Accomplishments



## Implemented all requested functionality

- Registering a butterfly by inputting an alpha code and their species
- Tagging a butterfly that is released into the butterfly farm based on their alpha code
- Ability to add new butterfly species into the database



# Implemented all requested functionality

- View all the reports made in the past and edit/delete each individual reports and butterfly as needed
- Generate reports based on specific parameters:
  - Alpha code, Species, Date Registered, Date Butterfly Tagged, Status, Report by, Report Group



# Example Reports Page



## Alphacode

AAD

## Species

Giant Wood Nymph | Idea leuconoe

## How long did it live?

7 days 0 hours 0 minutes 0.00 seconds

## How many times was it reported?

3

## When it was released?

2024-04-04

## When was the last report made?

2024-05-02

Logout



Logout

## Species

Broad Bordered Acraea | Acraea anemosa

## How many different butterflies in the species have reports?

6

## What is the average lifespan across the species?

NaN days NaN hours NaN minutes NaN seconds

## What is the average observations across the species?

0.16666666666666666

Alphacode	Species	Date Register	Date Report Made	Status	Lifespan
AAF	Broad Bordered Acraea   Acraea anemosa	2024-05-03	2024-05-03	alive	2 days 20 hours 52 minutes
QDF	Broad Bordered Acraea   Acraea anemosa	2024-04-24	2024-04-24	alive	11 days 4 hours 0 minutes 7
BBB	Broad Bordered Acraea   Acraea anemosa	2024-04-29	2024-04-29	alive	6 days 1 hours 51 minutes 4
undefined	Broad Bordered Acraea   Acraea anemosa	2024-04-29	2024-04-29	alive	6 days 1

Export to CSV

Export to CSV

Alpha code

Species

# Example Reports Page



Logout

## Date

2024-05-03

### What butterflies were released that day?

Alphacode	Species
SCF	Giant Wood Nymph   Idea leuconoe

### How many total butterflies were registered on that day?

1

Alphacode	Species	Date Registered	Status	Report By	Group	Action
SCF	Giant Wood Nymph   Idea leuconoe	2024-05-03	alive	admin	admin	Butterfly created

Export to CSV

Date Registered



Logout

## Date

2024-05-03

### What butterflies were seen that day?

Luna Moth | Actias luna

### What alphacodes were seen that day?

AAG

### How many total reports were made?

1

Alphacode	Species	Date Report Made	Status	Report By	Group	Action
AAG	Luna Moth   Actias luna	2024-05-03	alive	admin	admin	Public Sighting

Export to CSV

Date Butterfly tagged

# Example Reports Page



Logout

## Status

dead

What are the total number of dead butterflies?

1

Alphacode	Species	Date Register	Status	Butterfly Registered By
AAD	Giant Wood Nymph   Idea leuconoe	2024-04-04	dead	admin

## Status

alive

What are the total number of alive butterflies?

27

Alphacode	Species	Date Register	Status	Butterfly Registered By
AAQ	Broad Bordered Acraea   Acraea anemosa	2024-04-23	alive	None...

Export to CSV

Status



Logout

## Reported by

admin

Alphacode	Species	Date Register	Date Report Made	Status	Group	Action
TST	Smooth-banded Sister   Adelpha cytherea	2024-04-24	2024-04-24	alive	admin	Butterfly created
NKJ	Broad Bordered Acraea   Acraea anemosa	2024-04-18	2024-04-25	alive	admin	Butterfly created
HHH	Mexican Sister   Adelpha fessonia	2024-04-22	2024-04-25	alive	admin	Butterfly created
JKC	Mexican Sister   Adelpha fessonia	2024-04-22	2024-04-25	alive	admin	Butterfly created
ALK	Broad Bordered Acraea   Acraea anemosa	2024-04-27	2024-04-27	alive	admin	Butterfly created
undefined	Broad Bordered Acraea   Acraea anemosa	2024-04-29	2024-04-29	alive	admin	Butterfly created
ZXC	Mexican Sister   Adelpha fessonia	2024-04-29	2024-04-29	alive	admin	Butterfly created
MBM	Luna Moth   Actias luna	2024-04-29	2024-04-29	alive	admin	Butterfly created
BBB	Broad Bordered Acraea   Acraea anemosa	2024-04-29	2024-04-29	alive	admin	Butterfly created
BBC	Orange Acraea   Acraea eponina	2024-04-29	2024-04-29	alive	admin	Butterfly created

Export to CSV

Reported by

# Example Reports Page



Logout

## Reported by Group

docent

Alphacode	Species	Date Register	Date Report Made	Status	Reported by	Action
AAG	Luna Moth   Actias luna	2024-04-16	2024-05-02	alive	test 12	Public Sighting

## Reported by Group

public

Alphacode	Species	Date Register	Date Report Made	Status	Reported by	Action
AAG	Luna Moth   Actias luna	2024-04-16	2024-05-02	alive	test 11	Public Sighting

## Reported by Group

admin

Alphacode	Species	Date Register	Date Report Made	Status	Reported by	Action
TST	Smooth-banded Sister   Adelpha cytherea	2024-04-24	2024-04-24	alive	admin	Export to CSV



# Deployed web app for use by client

- 900+ logs reported
- 26 recorded users (8 days of deployment)



# Minor Accomplishments

## Implemented additional features



- Implemented QOL improvements to the websites according to the feedback from the client
- Some improvements include:
  - Auto populating alpha code in registering a butterfly
  - Validation for alpha code entry to ensure no duplicate data

## Implemented additional features pt. 2



- Some improvements include:
  - Alternating color for each rows for the table in the Manage Data and the Report page for easier time reading the data
  - Date input to register butterfly to allow the input of previously released butterfly



# Styled all the pages

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- Made it so that the pages are user friendly
- Since user are most probably using their mobile device:
  - All the text are easy to read
  - The buttons are easy to click
- Ensure that all pages are able to be accessed easily within a few clicks



# Challenges encountered

- Server Errors (seemingly random)
- Deployment
- Complex tasks asked by the client
- Time crunch wrapping up the project
- Bug fixes

# Server Errors

- CORS error that seemingly fixed itself
- Time Zone for AWS server seems to be in UTC

Central Daylight Time (CDT).

Ames, Iowa · UTC-5



# Time crunch, deployment

- A lot a bug fixes and functions implemented after deployment
- Certain report calculation needs to be altered.
- Fixing and redeploying takes time
- Changed URL from absolute pathing to relative pathing



## Bug Fixes and Functions Implemented

- Auto populate Alphacode
- Butterfly alive time span calculations
- Butterfly seen count
- Export CSV was not working
- Death date not showing on Manage Data page
- Total number of views showing up as NaN

# Summary of Contributions



Richard - client contact, styling majority of frontend, implemented frontend features

Kaden - assisted with developing pages for frontend, implemented frontend features, assisted with documentation

Tze Yik- implemented frontend features, implemented backend features, implement bug fixes and updates to the app post deployment based on client request

# Summary of Contributions pt. 2



Joey - handled majority of backend, set up AWS server to host database, handled web app deployment

Wave - assisted with front end styling, implemented frontend features, handled majority of documentation, drew the architecture diagram, assisted in bug fixes and QA testing.