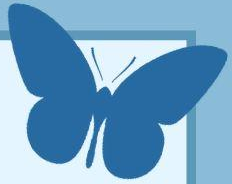


flutter

sddec24-11

# Team Members



Taylor Barnhart - Team Leader, Cloud Integration

Amanda Friis - Full Stack Developer, Documentation

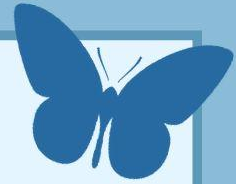
Nathan Geater - Full Stack Developer (Back End)

Alex Brown - Front End Development Leader

Muralikrishna Patibandla - Integration & Back End Development Lead

Piper Ideker - Testing

# Introduction

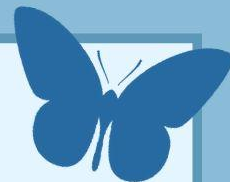


Flutr is an all-in-one web app for flight houses that aims to aid both flight house employees and visitors, each with their own goals.





How do pavilions  
handle butterflies?



# Step 1 - Receive



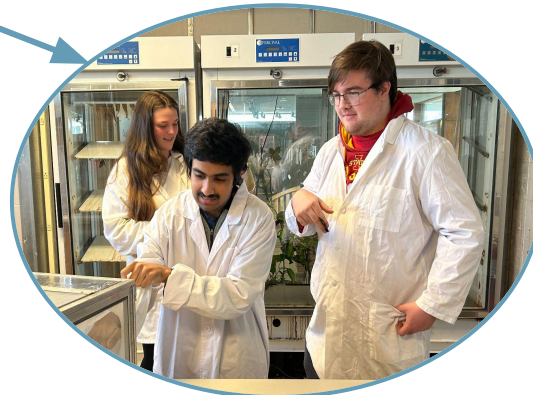
Pavilion receives a box of pupae and stores them in an incubation chamber



# Step 2 - Emergence

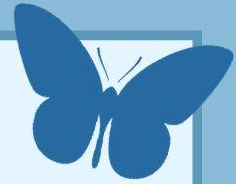


Pavilion receives a box of pupae and stores them in an incubation chamber

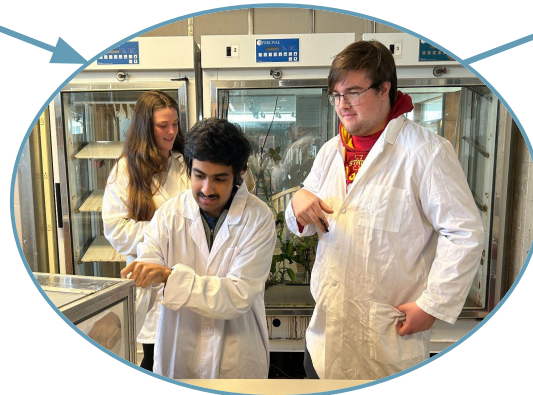


Once butterflies emerge, they need to be transferred to the pavilion

# Step 3 - Released



Pavilion receives a box of pupae and stores them in an incubation chamber



Once butterflies emerge, they need to be transferred to the pavilion



Beautiful butterflies flying in pavilions world-wide!



# How are pavilions keeping data?

- Mostly spreadsheets
  - Slow
  - Prone to human error
  - Difficult to compile into usable data
- No data tracking once butterflies in-flight
- Certain data must be submitted annually to USDA

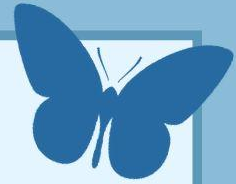




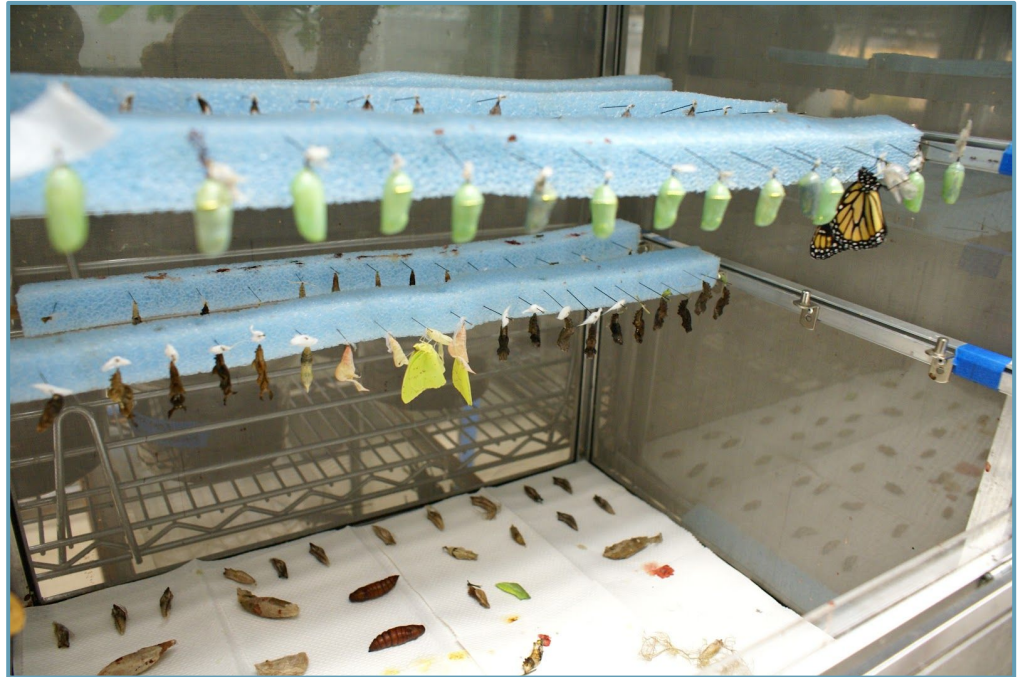


How can Flutr help?

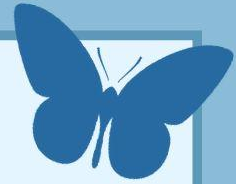
# Requirements



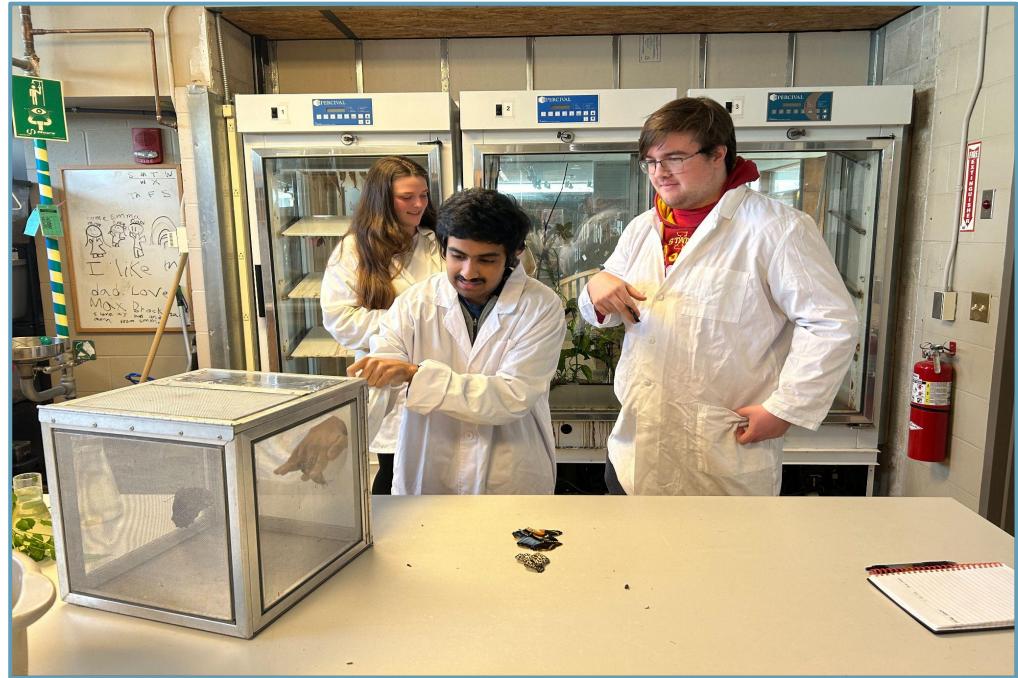
Flutr shall implement the adding, editing, and viewing of shipments



# Requirements



Flutr shall track which butterflies are ready to be released



# Requirements



Flutr shall keep an estimate of butterflies in flight by

1. Utilizing butterfly predictive lifespan tracking
2. Automatically deleting end-of-life butterflies





# Requirements



Flutr shall connect guests to a pavilion while providing a rich learning environment by:

- Keeping up-to-date with pavilion news via their home page
- Learning about butterflies using the butterfly gallery
- Viewing facts/statistics about butterflies in a pavilion

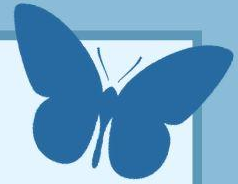
The screenshot displays the website's home page for the Christina Reiman Butterfly Wing. At the top, there is a green navigation bar with a 'Home' link. Below this, the page is divided into several sections:

- Butterfly of the Day:** Features a large image of a Common Mormon butterfly (*Papilio polytes*) with the text 'Number in flight: 4', 'Contine', and 'Fun fact meaning each of females of those'.
- Nathan's Note:** A text block starting with 'We're thrilled to share that a stunning group of *Toxides rhadamantus*, also known as the Common Birdwing, has just arrived! These butterflies are a marvel to be their shimmering golden-yellow hindwings and flight that truly lives up to their "birdwing" name for their elegance and size, they're sure to call anyone lucky enough to see them up clo'.
- Statistics:** A section with a green header containing a donut chart titled 'Butterfly Family Breakdown' showing the distribution of 261 butterflies in flight across five families: Saturniidae, Papilionidae, Nymphalidae, Pieridae, and Hesperidae. Below the chart is a legend and the text 'Current Populations'. A small image of an *Archaeoprepona* butterfly is shown with the note 'There are only 1 of the *Archaeoprepona*'.
- Gallery:** A grid of nine butterfly images, each with a caption: *Eueides isabella* (Isabella's Heliconian), *Heliconius atthis* (Atthis Longwing), *Heliconius cydno* (Cydno Longwing), *Heliconius erato* (Crimson-Patch Longwing), *Heliconius hecale* (Tiger Longwing), and *Heliconius ismenius* (Ismenius Longwing).



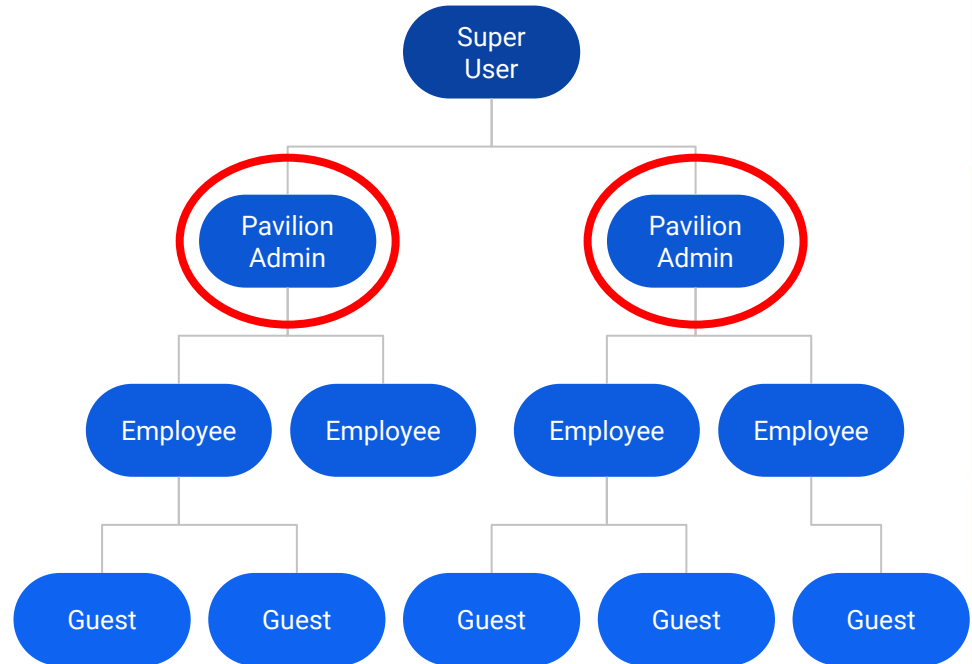
# Requirements - Administration

# Administration

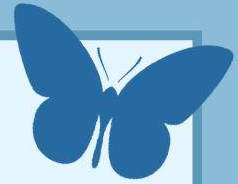


## Pavilion Admin:

- Create, edit, deactivate employees
- Customize home page
- View, add, deactivate, edit shipment suppliers

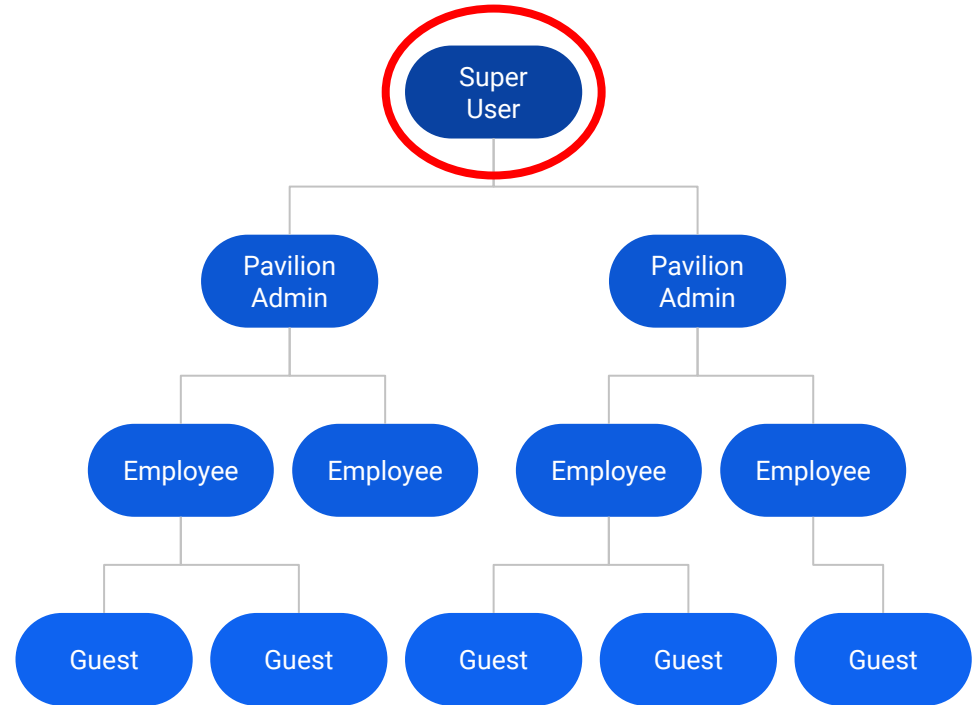


# Administration



Super User:

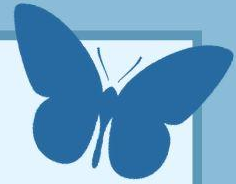
- Create pavilions
- Add and edit butterflies on master butterfly list
- Export data from pavilions





# Kiosk

- Reiman Gardens exclusive in-pavilion access to Flutr
- Previous kiosk deemed inoperable after COVID
- Our team needed to:
  - Replace touchscreen
  - Improve heat/humidity resistance
  - Ensure guests cannot leave Flutr webpage

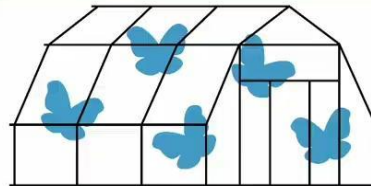


## Flutr Directory

Find butterfly houses from around the world.

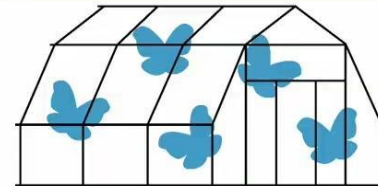


**Christina Reiman Butterfly Wing**  
1407 University Blvd. Ames, IA 50011



**COMING SOON**

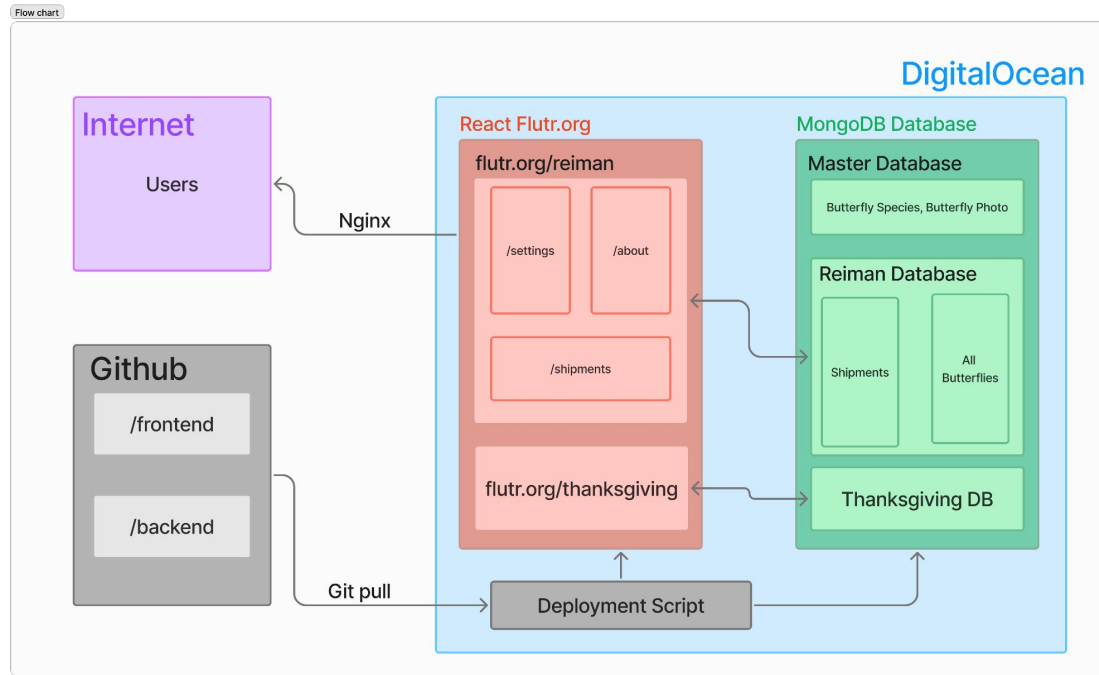
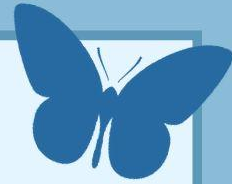
**[Sophia Sachs Butterfly House](#)**  
[MO](#)



**COMING SOON**

**Butterfly Pavilion**  
Westminster, CO

# Design Overview

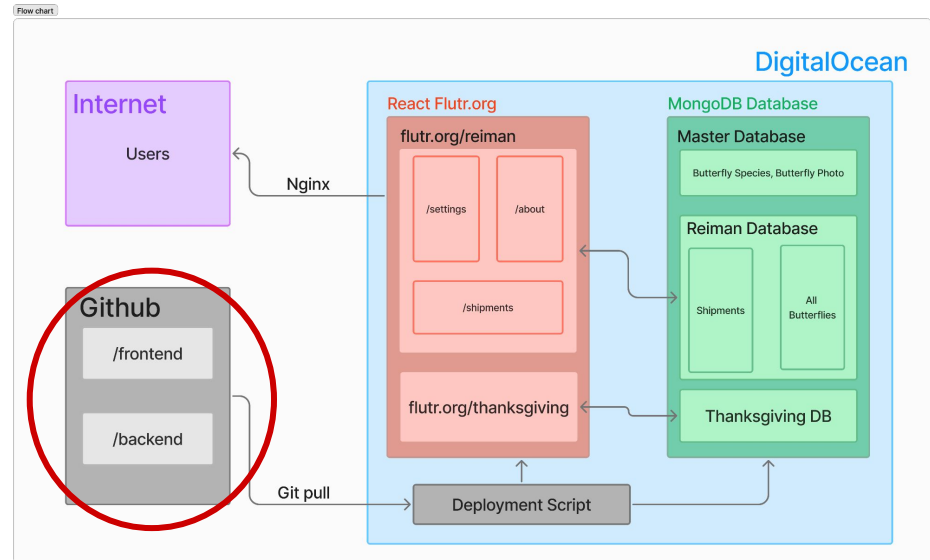


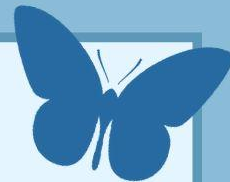


# Design Overview

## Code Repository: Github

- Holds both frontend and backend code in 1 repository
- All team members have experience
- Deployed to cloud through developer-run script

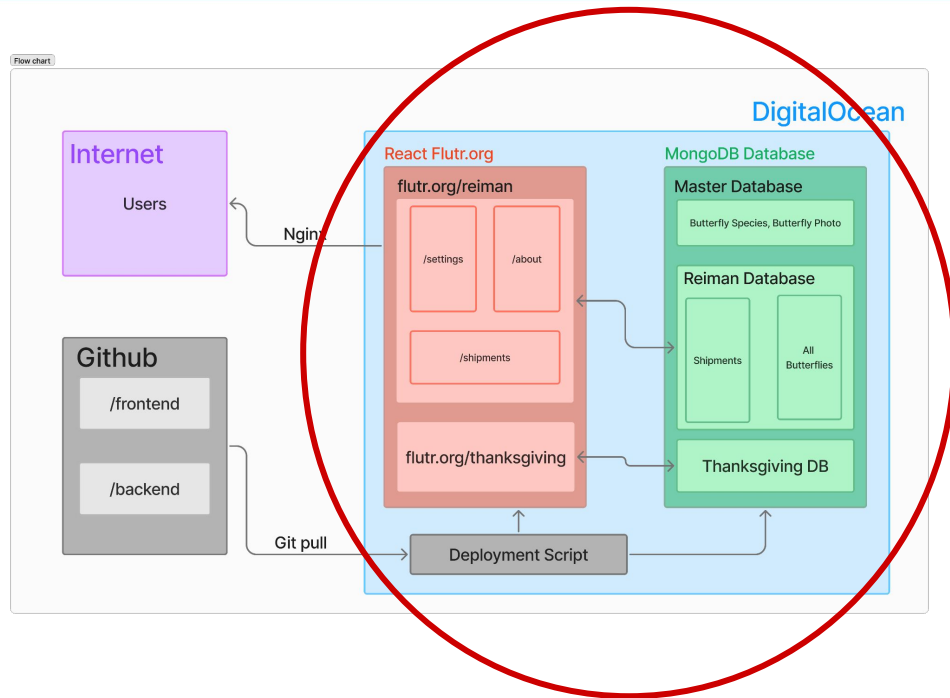


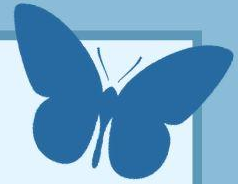


# Design Overview

## Cloud: DigitalOcean

- Virtual Linux Machine
- Hosts frontend and backend services
- Controls flutr.org domain address

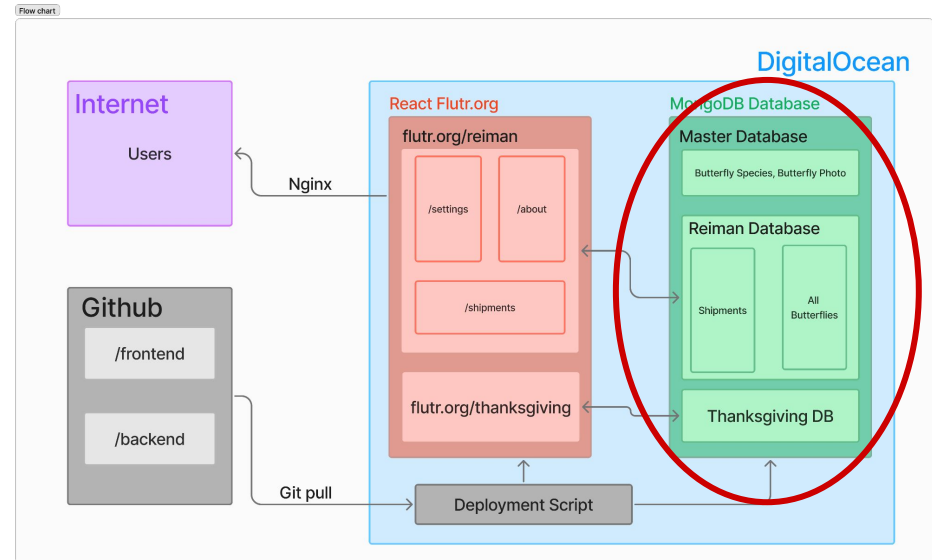




# Design Overview

## Backend: Springboot & MongoDB

- Springboot handles data and places it into MongoDB databases
- Springboot handles API calls from frontend through VM port 8282
- MongoDB holds butterfly info, org info, etc

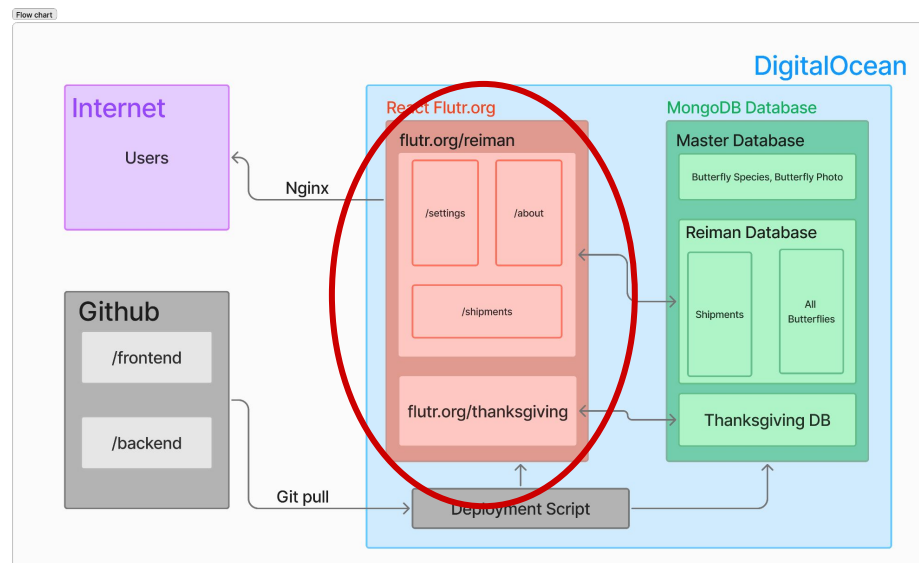


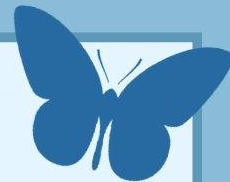


# Design Overview

## Frontend: React & Nginx

- React.js is the framework that our UI is based upon
- Nginx hosts the React.js application through the server's IP address

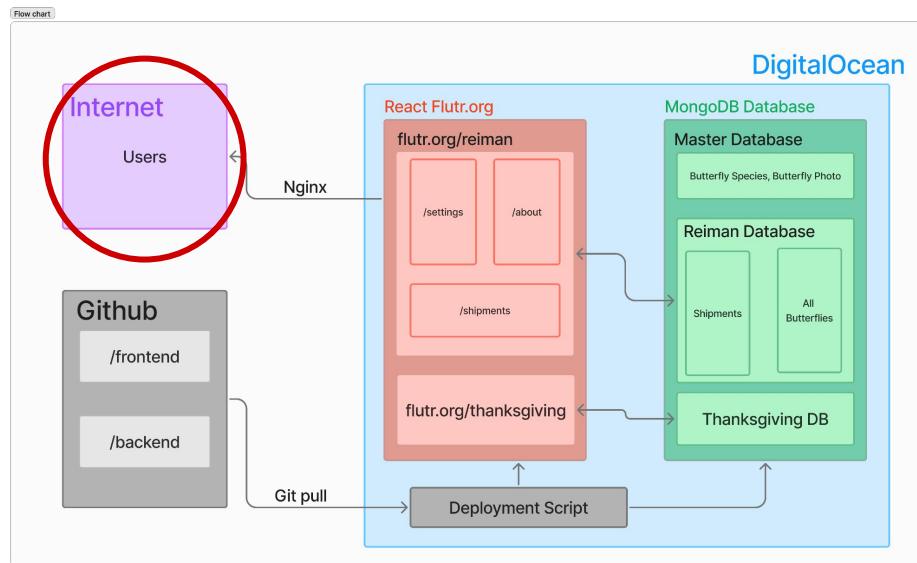




# Design Overview

Users: Any Web Browser

- [www.flutr.org](http://www.flutr.org)
- Added HTTPS support



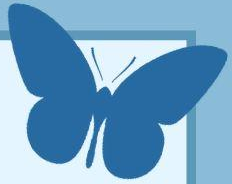




# Frontend Overview

- Built In React.js
  - New Standard
  - Component Based
- 24 Unique Pages
- Fetch Library
- Pages Require Authorization

# Frontend Tech

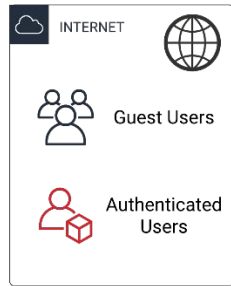


- Commonly Used Items as Components
- React-Router for Paths
- JWT in `window.sessionStorage`
- State for Inter-Page Context

# Backend

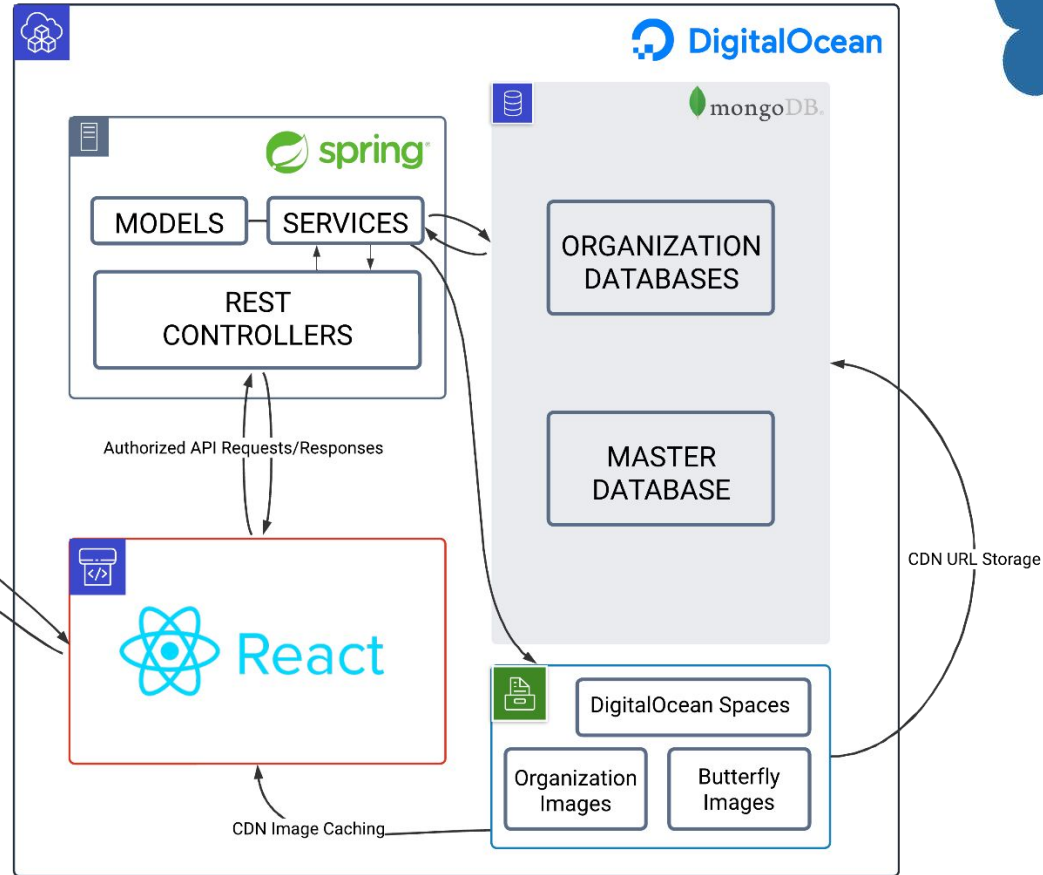


- SpringBoot Backend and RESTful endpoints
- MongoDB multi-tenant database architecture
- DigitalOcean Cloud hosting, File storage and CDN caching with Spaces
- User Authentication using Json Web Tokens



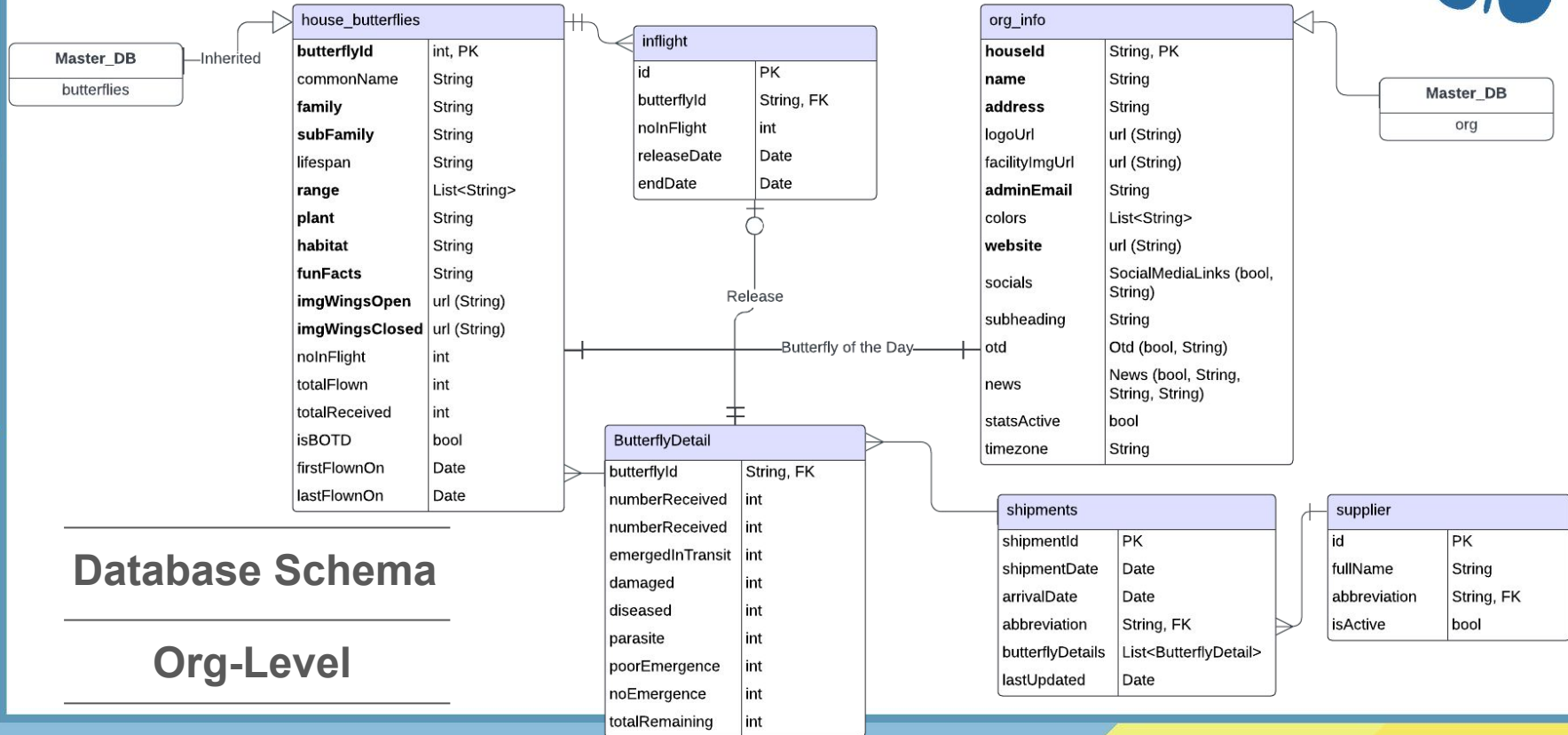
Flutter

## System Components





<Org\_Name>\_DB

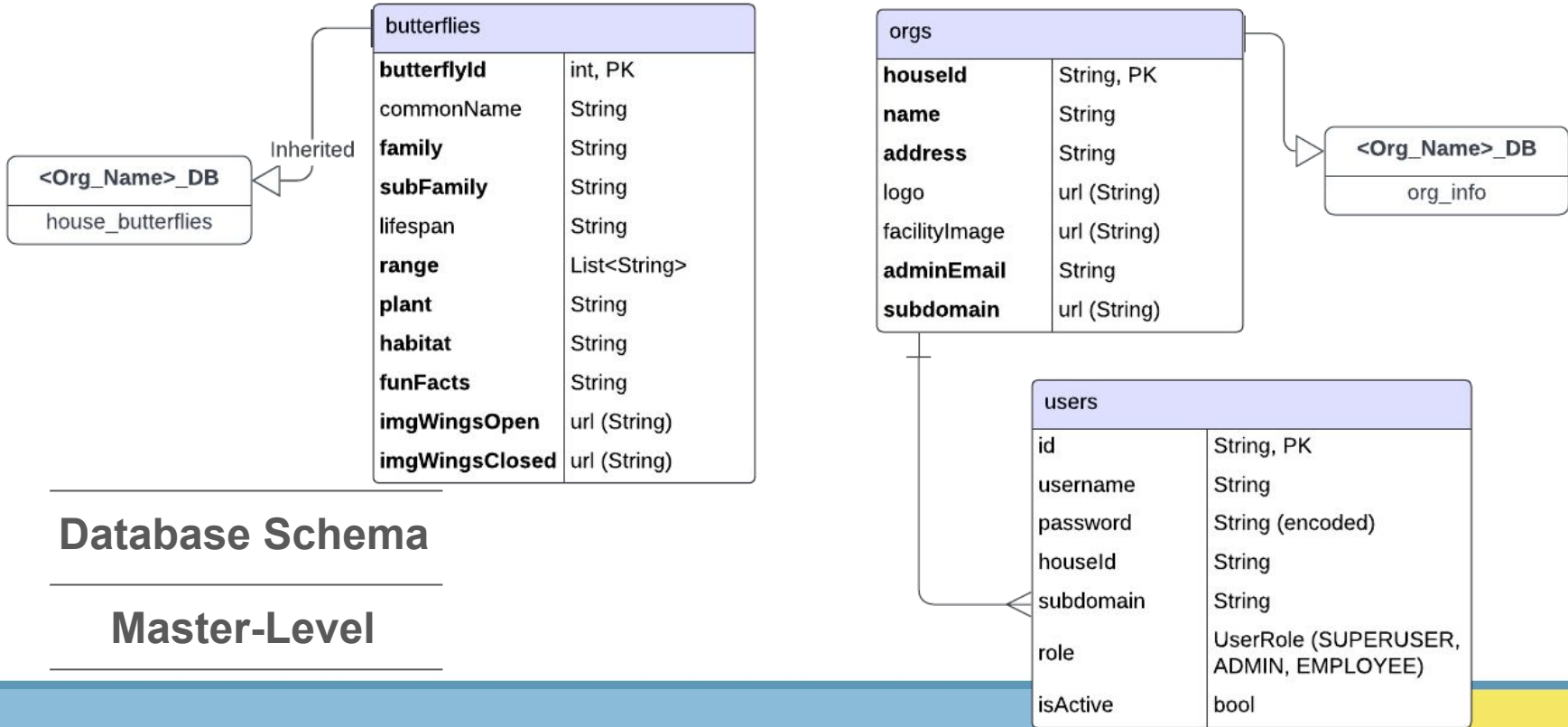


## Database Schema

### Org-Level



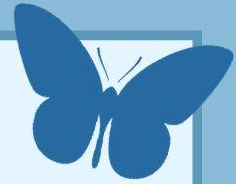
Master\_DB



## Database Schema

### Master-Level

# Final Progress - General Overview



- Overview of project:
  - We have fulfilled every requirement for the entomologists and general public.
  - We have more organizations on board:
    - Omaha Henry Doorly Zoo & Aquarium
    - Tucson Botanical Gardens
    - The Butterfly Place (Westford MA)
  - We currently have 184 butterflies in the Christina Reiman Gardens gallery page
- Final Touches:
  - Our client will continue to import butterflies (pictures and information) into the system.
  - We are cleaning up some test environments.



# Final Progress - Engineering Standards

- IEEE 830-1998: Software Requirements Specification - Ensures that all parties have a clear, shared understanding of the software's functionality and non-functional properties.
  - Tracks butterfly release data (e.g., species, date, damaged, etc.).
  - Provides an interface for kiosk users to view current butterflies.
  - Exports data in USDA-compliant formats.
- IEEE 1012-2016: System and Software Verification and Validation - Establishes the processes and tasks for Verification and Validation.
  - Verification: Unit tests for each page (e.g., gallery, statistics, organization page, etc.).
  - Validation: Gathered feedback from entomologists to confirm Flutr meets their needs.



# Demo Videos



## Creating Organization

The screenshot shows the Flutr website home page. At the top left is the Flutr logo. The main content area features a 'Flutr Directory' section with a search bar and the text 'Find butterfly houses from around the world.' Below this are three cards for butterfly houses: 'Christina Reiman Butterfly Wing' (1407 University Blvd. Ames, IA 50011), 'Sophia Sachs Butterfly House' (MO), and 'Butterfly Pavilion' (Westminster, CO). Both the latter two are marked 'COMING SOON' with a butterfly icon.

## Edit

The screenshot shows the Flutr website login page. It features a 'Login to Flutr' form with fields for 'username' and 'password', and 'Cancel' and 'Login' buttons. The Flutr logo is in the top left, and navigation links for 'Home' and 'About' are in the top right. A copyright notice '© 2024 Reiman Gardens All Rights Reserved.' is at the bottom.

## Add Shipment

The screenshot shows the 'Add Shipment' page on the Flutr website. The page has a red header with the Flutr logo and navigation links for 'Home', 'Statistics', 'Gallery', and 'Administration'. The main content area is green and contains a 'News Title' section with a link to 'The News', a 'Statistics' section showing '0 butterflies in flight', and a placeholder for an image.

## Make Release

The screenshot shows the 'Make Release' page on the Flutr website. It has a red header with the Flutr logo and navigation links for 'Home', 'Statistics', 'Gallery', and 'Administration'. The main content area is green and contains a 'News Title' section with a link to 'The News', a 'Statistics' section showing '0 butterflies in flight', and a placeholder for an image.

## Stats

The screenshot shows the 'Stats' page on the Flutr website. It has a green header with the 'REIMAN GARDENS' logo and navigation links for 'Home', 'Statistics', and 'Gallery'. The main content area is white and contains a 'Christina Reiman Butterfly Wing' section with a 'Butterfly of the Day' (Numata Longwing) and a 'Nathan's Note' about the butterfly.

## Gallery

The screenshot shows the 'Gallery' page on the Flutr website. It has a green header with the 'REIMAN GARDENS' logo and navigation links for 'Home', 'Statistics', and 'Gallery'. The main content area is white and contains a 'Christina Reiman Butterfly Wing' section with a 'Butterfly of the Day' (Numata Longwing) and a 'Nathan's Note' about the butterfly.



Thank You For Listening  
Questions?