



# Reiman Gardens Butterfly App

Team Dec1608

**Michael Bonpua: Team Leader**

**Nicholas Riesen: Communications Lead**

**Megan Reiman: Key Concept Holder**

**Carson Noble: Webmaster**

**Scott Mueller: Key Concept Holder**

Diane Rover - Team Advisor

Nathan Brockman - Client

Anita Westphal - Client

# The Christina Reiman Butterfly Wing

- Botanical Garden (17 acres)
- Glass Structure
- 800 butterflies
- 80 species



# The Kiosk

- Designed specifically to withstand conditions of wing
- Touchscreen (no keyboard/mouse)
- Challenge: No/spotty internet access (directional antenna)






# Existing Application

- Hard to use
- Does not scale (well) to screen size
- Not secure
- Hard-coded values

<b>Species in Flight</b>
74
<b>Butterflies currently in the Wing</b>
763

 Log in

**Welcome to the Reiman Gardens Butterfly App!**

Select Trait(s) to Search on:

Traits

AntennaeType - Feathery

ClearWings - Yes

InsideColor - Black

InsideColor - Blue

InsideColor - Brown

InsideColor - Gray

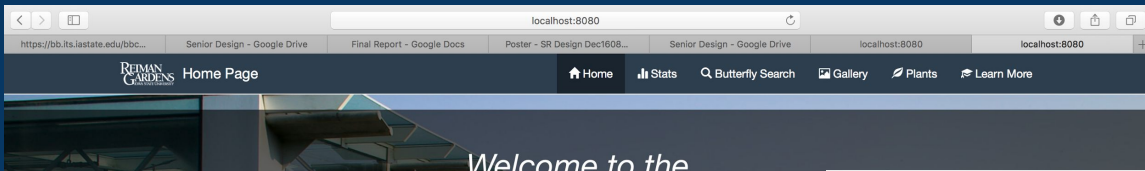
Select Trait(s) to Search on:

Traits



Find Matching Butterflies

- Antennae Type - Feathery
- ClearWings - Yes
- InsideColor - Black
- InsideColor - Blue
- InsideColor - Brown
- InsideColor - Gray
- InsideColor - Green
- InsideColor - Orange
- InsideColor - Pink
- InsideColor - Purple



**Nathan's Note**

In the Butterfly Lab we are currently working on a research project with other butterfly exhibits around the world. We are collecting their pupae emergence data and their emergence chamber condition to see if we can identify the best condition for emergence.

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Search Page - Advanced

Currently Inside Butterfly Wing

All

Size

Tan Color(s)

Search Results

- Papilio glaucus**  
Tiger Swallowtail
- Asterocampa celtis**  
Hackberry Emperor
- Opsiphanes tamarindi**  
Narrow-banded Owllet
- Hypolimnys misippus**  
Danaid Eggfly
- Papilio astyalas**

Gallery

Home Stats Butterfly Search Gallery Plants Learn More Identify

<b>Acraea anemosa</b> (Broad Bordered Acraea)	<b>Acraea eponina</b> (Orange Acraea)	<b>Actias luna</b> (Luna Moth)	<b>Adelpha cytherea</b> (Smooth-banded Sister)
<b>Adelpha fessonia</b> (Mexican Sister)	<b>Agraulis vanillae</b> (Gulf Fritillary)	<b>Amauris ochlea</b> (Novice)	<b>Anartia fatima</b> (Banded Peacock)

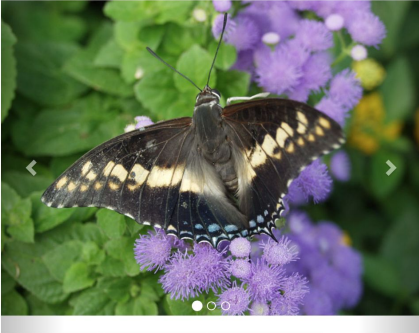



localhost:8080/butterfly/Char... >>

bootstrap - Google Search localhost:8080/butterfly/Charaxes... +

REHMAN GARDENS Butterfly Information ☰

# Charaxes castor

## Giant Charaxes

**Basic Information**

<b>General information</b>	<b>Species Range:</b>
Family: Nymphalidae	• Africa
Sub Family: Charaxinae	
Estimated Lifespan: 9 Days	<b>Host plants:</b>

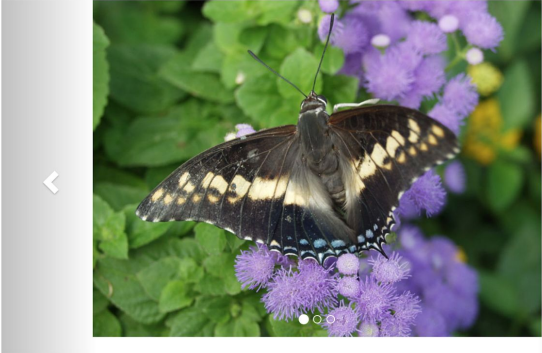



localhost:8080/butterfly/Charaxes%20castor >>

bootstrap - Google Search localhost:8080/butterfly/Charaxes%20castor +

REHMAN GARDENS Butterfly Information Home Stats Butterfly Search Gallery Plants Learn More Identify

# Charaxes castor

## Giant Charaxes

**Basic Information**

<b>General information</b>	<b>Species Range:</b>	<b>Host plants:</b>
Family: Nymphalidae	• Africa	• Afzenia
Sub Family: Charaxinae		• Brachystegia
Estimated Lifespan: 9 Days		• Chaetaecme

Open #myCarousel on this page in a new tab cific information

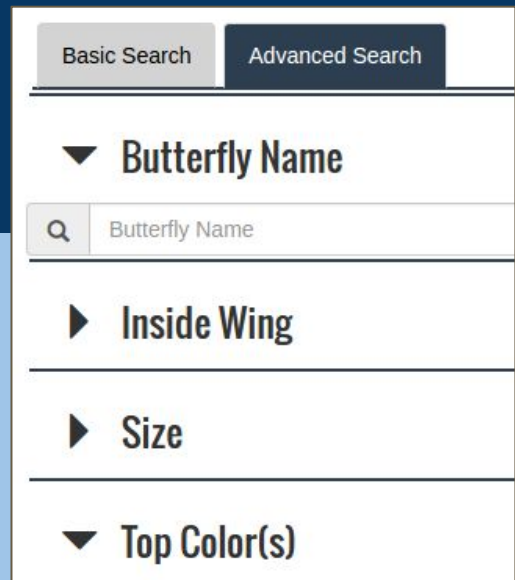
# Project Goals and Scope

## Visitor side

- Visually appealing
- Easy to use
- Responsive to screen size

## Administrative side

- Add/edit data in database
- Store additional information
- Pull statistics from data



Basic Search | **Advanced Search**

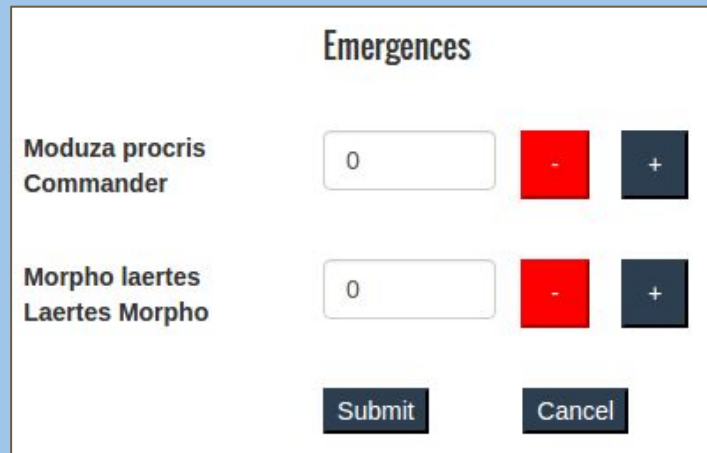
▼ **Butterfly Name**

Q Butterfly Name

▶ **Inside Wing**

▶ **Size**

▼ **Top Color(s)**



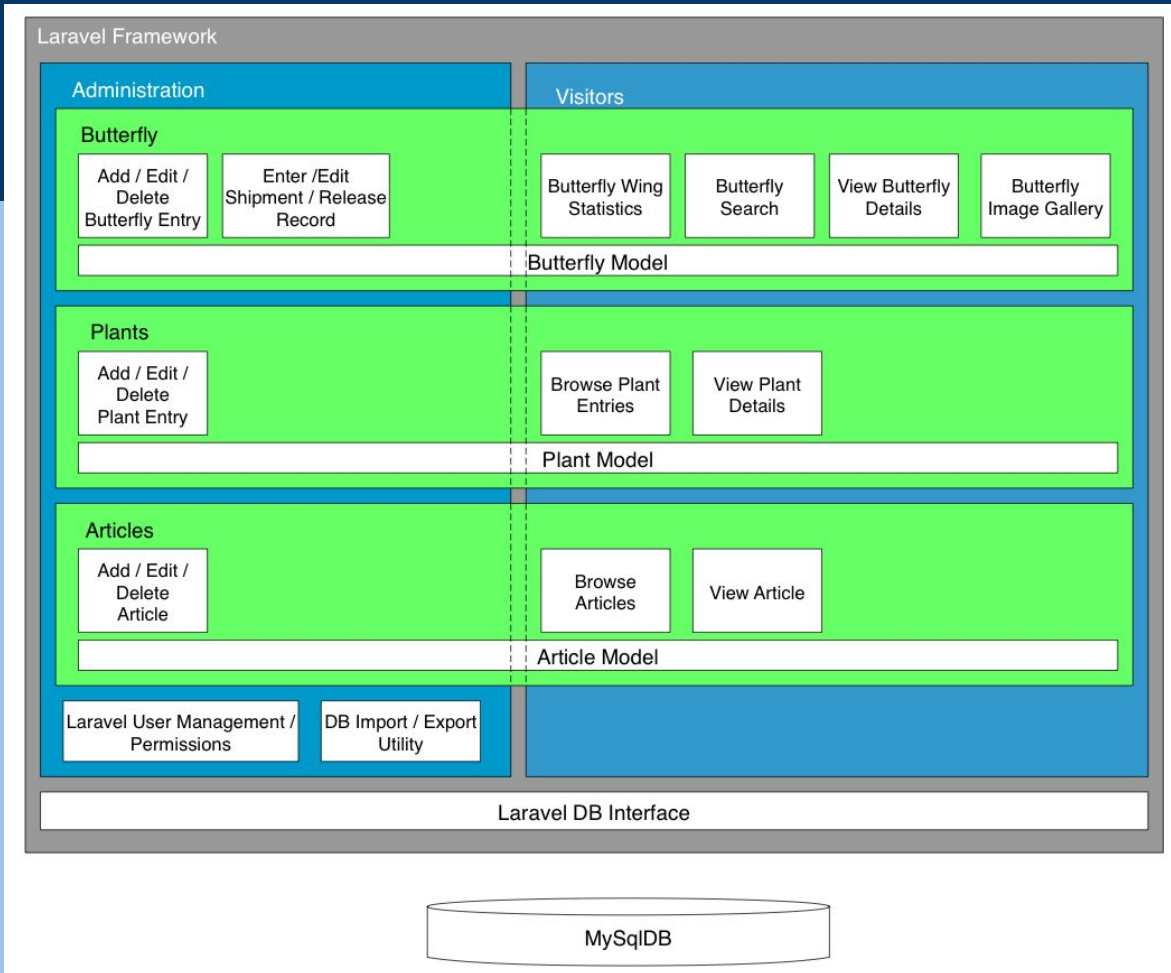
**Emergences**

Moduza procris Commander	<input type="text" value="0"/>	-	+
Morpho laertes Laertes Morpho	<input type="text" value="0"/>	-	+

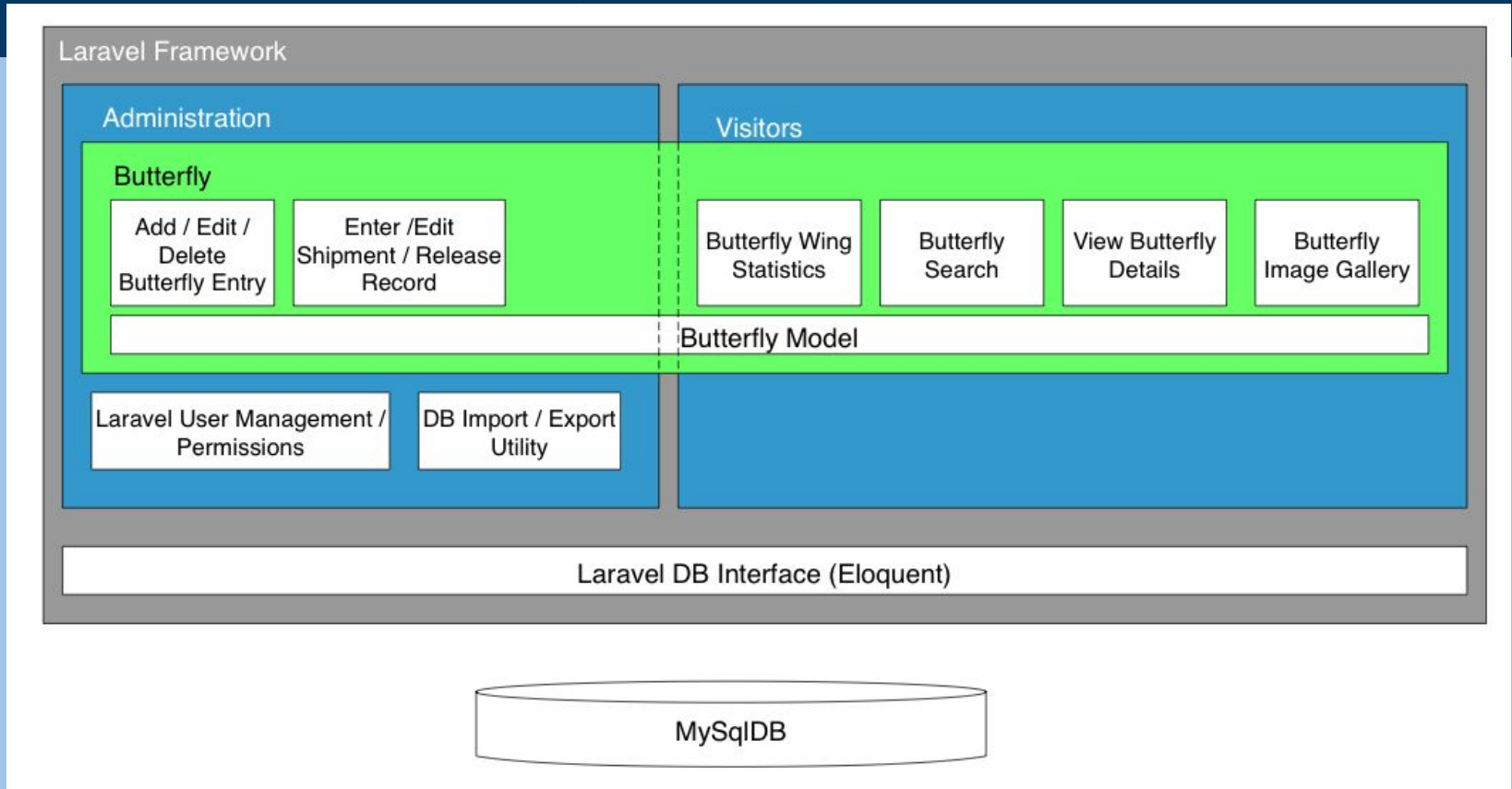
Submit Cancel



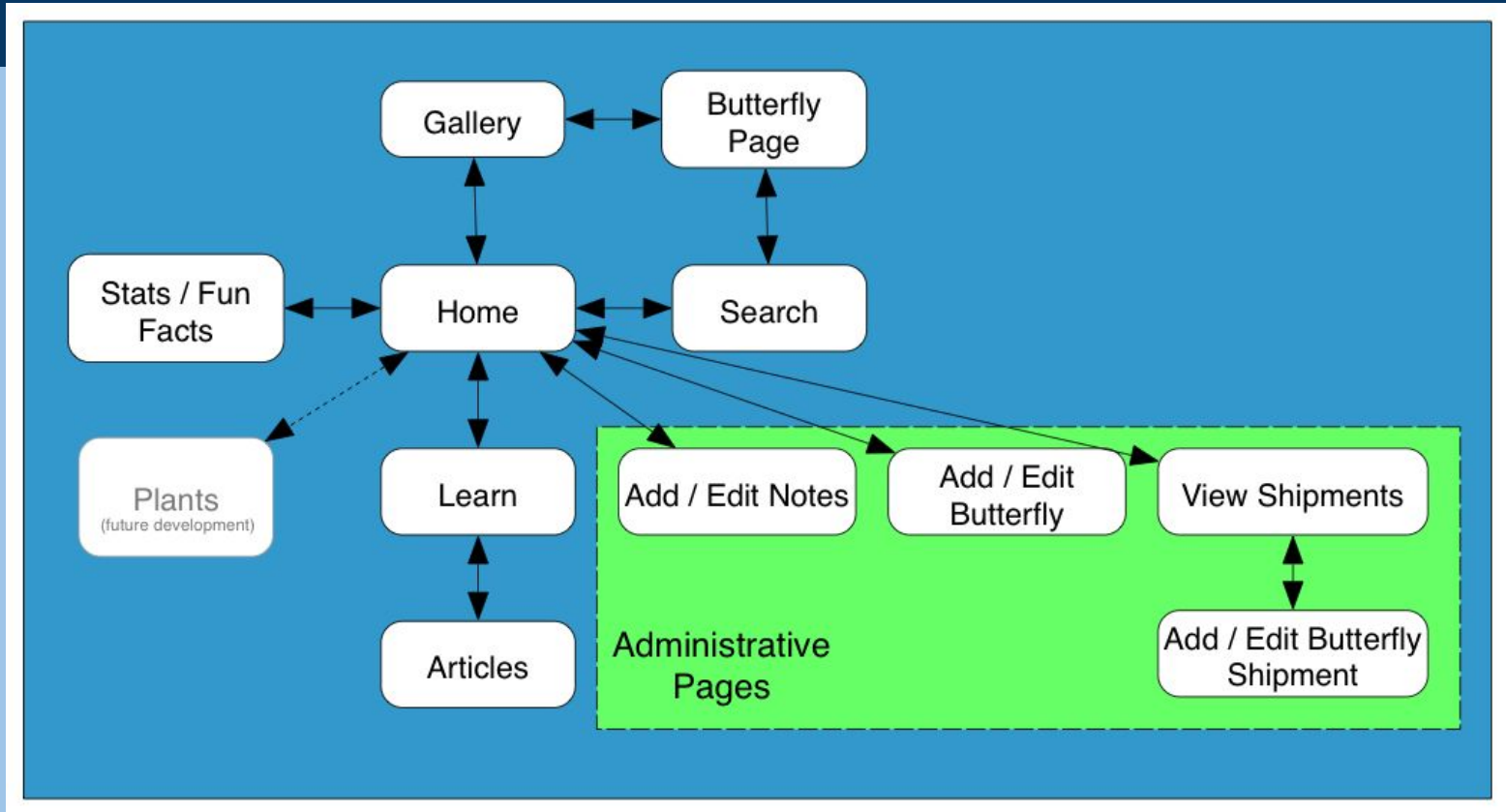
# Component Design



# Butterfly Component



# Site Map

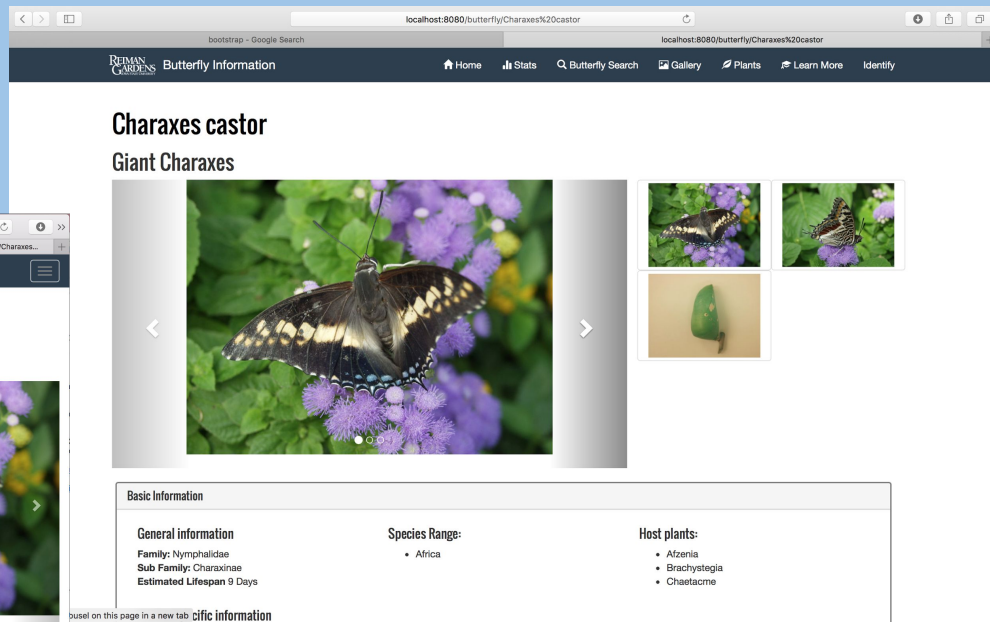
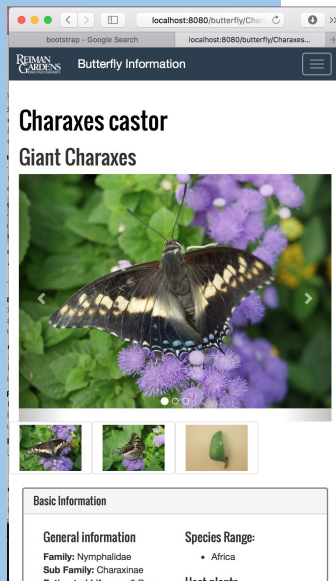


# Front End Technologies Used



## Bootstrap

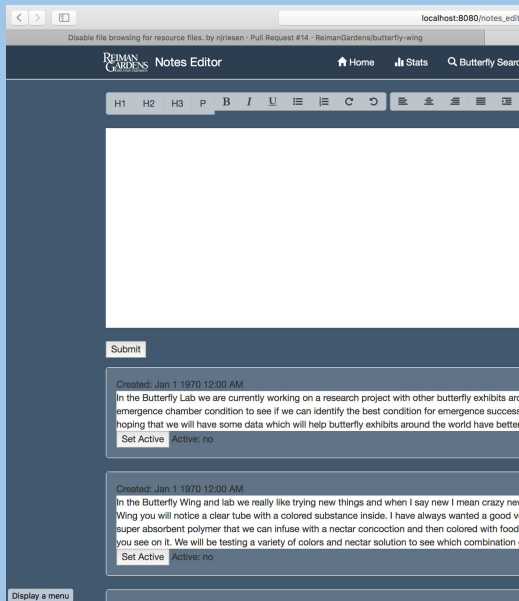
- Minimized the amount of styling needed
- Provides easy to use grid system
- Provides scaling functionality



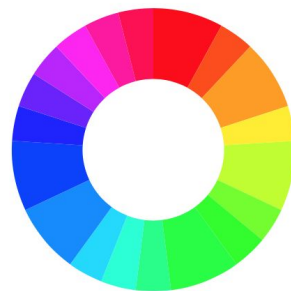


# Other Front End Technologies

- TextAngular -- Notes (Austin Anderson)
- Chart.js -- Stats charts
- Lightbox -- Gallery (Lokesh Dhakar)



## Species Distribution



Origin	Species
Africa	2
Americas	1
Asia	2
Central & So. America	1
Central & South America	2
central Africa	1
Central America	1
Central and South America	2
Europe, north Africa, temperate Asia	1
Himilayas, India, Burma, China	1

# Back End Technologies Used



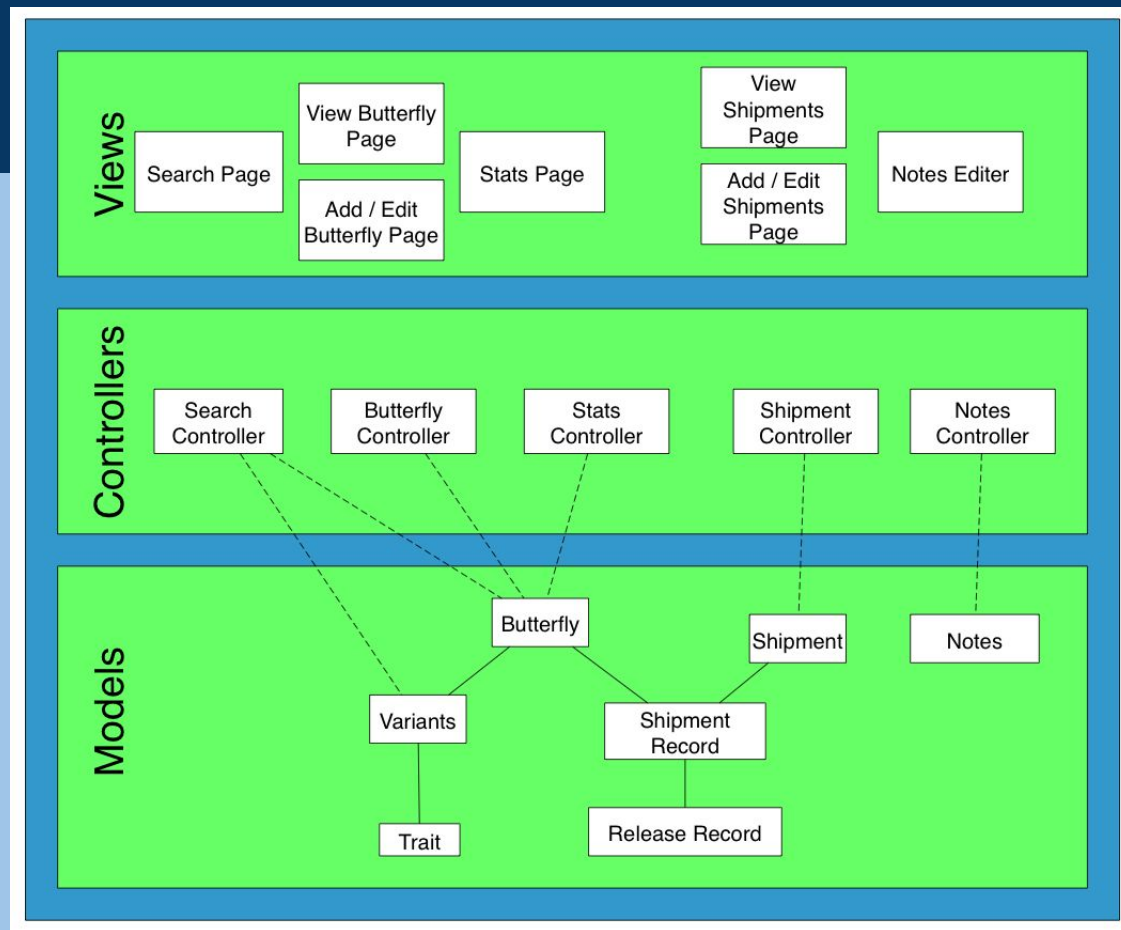
- PHP framework
- Provides authentication
- Object-to-DB mapping (Support for MySQL)
- HTML templating
- Easy routing

Psy Shell v0.7.2 (PHP 5.6.27 - cli) by Justin Hileman

```
>>> App\Butterfly::find(5);
=> App\Butterfly {#694
    id: 5,
    scientific_name: "Acraea anemosa",
    common_name: "Broad Bordered Acraea",
    alt_common_name: null,
    host_plant: "Modecca abyssinica, Adenia, Vitis",
    species_range: "'NorthAmerica','SouthAmerica','Africa'",
    pinned_specimen: "0",
    card: "0",
```

```
@section('content')
    @if(count($results))
        <div class="container">
            @foreach(array_chunk($results->getCollection()->all(), 4) as $row)
                <div class="row">
                    @foreach($row as $img)
                        <div class="col-md-3 col-xs-4">
                            <div class="panel panel-default">
                                <div class="panel-body">
                                    <a href="/{{ str_replace("Gallery/", "img/butterflies/", $img->url) }}"
                                        data-size="800x800">
                                        url) }}"/>
                                    </a>
                                    <a href="/butterfly/{{ $img->scientific_name }}">
                                        <p>{{ $img->scientific_name }}</p>
                                        @if($img->common_name)
                                            <p>{{ $img->common_name }}</p>
                                        @endif
                                </div>
                            </div>
                        </div>
                    @endforeach
                </div>
            @endforeach
        </div>
    @endif
```

# Class Diagram



# Database Schema - MySql

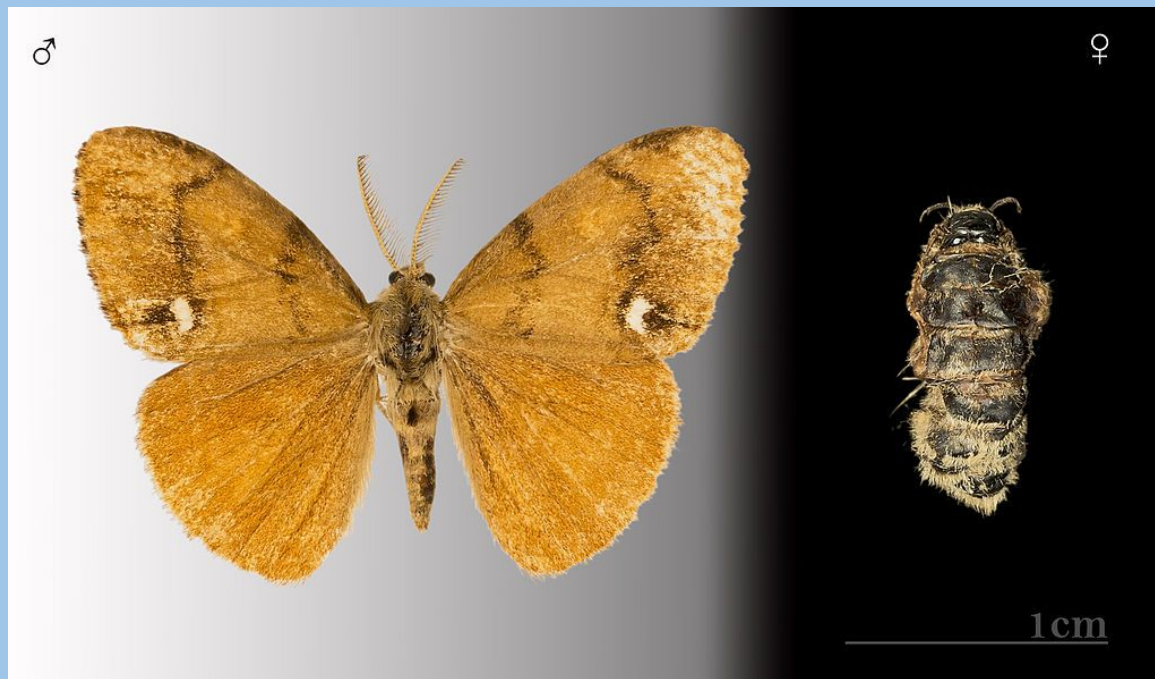
- Setup
  - Environment
  - Restructuring
- Use
  - Butterflies table
  - Related tables
  - Other tables





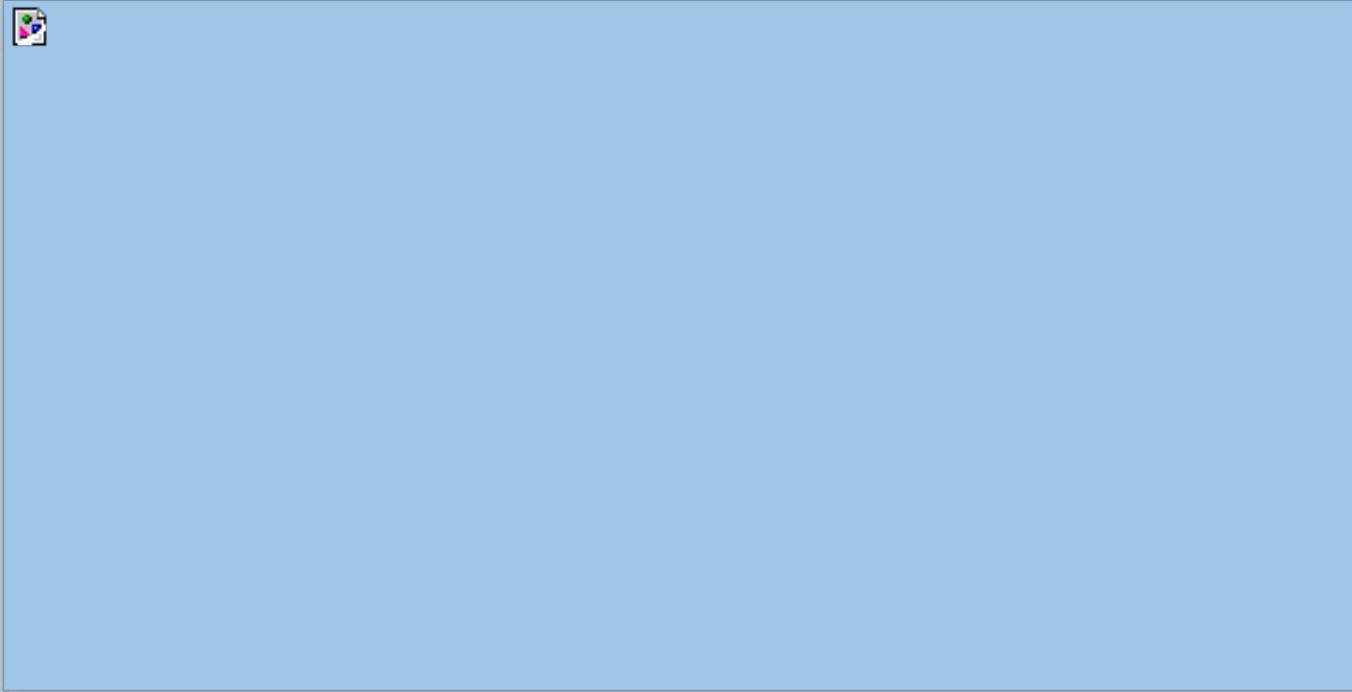
# Database Schema - Considerations

- Dimorphism
  - Males and Females differ
  - Common in many plants and animals
- 
- How to store?

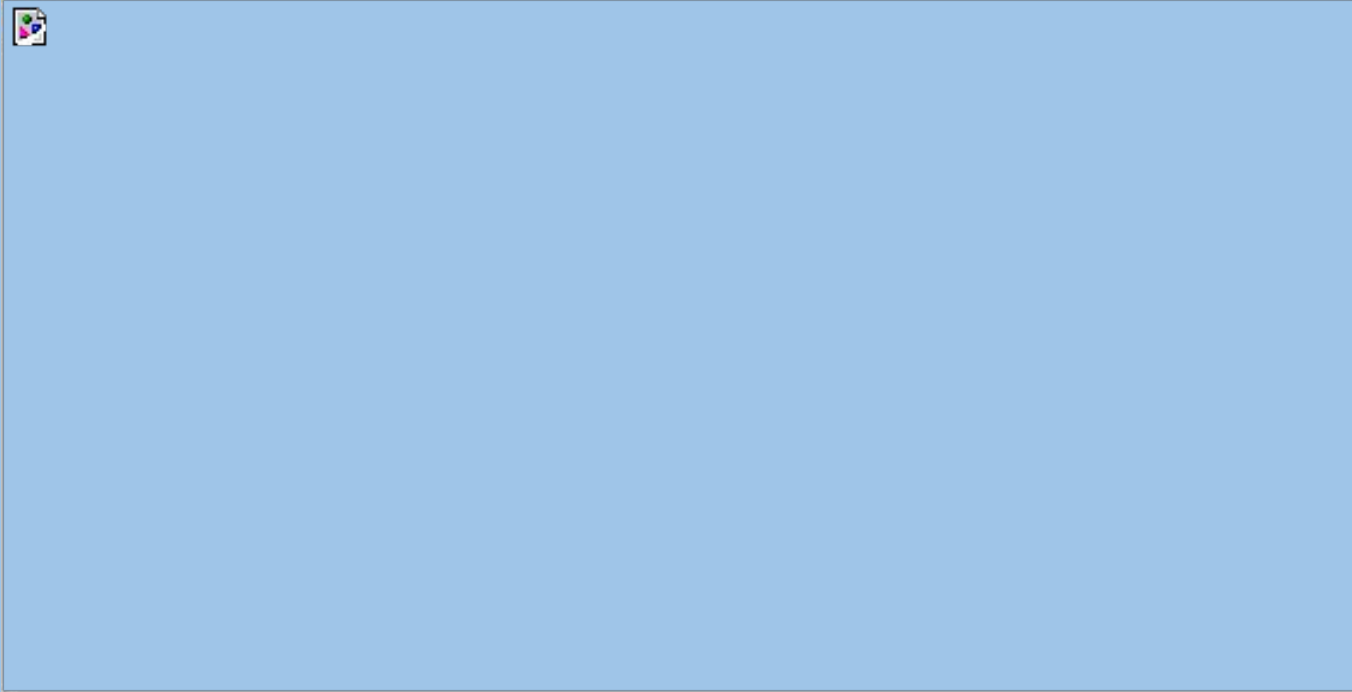


Male (left) and Female (right) *Orgyia antiqua* (Rusty Tussock)  
Retrieved from Wikimedia Commons

# Database Schema - Visitor Tables



# Database Schema - Staff Tables

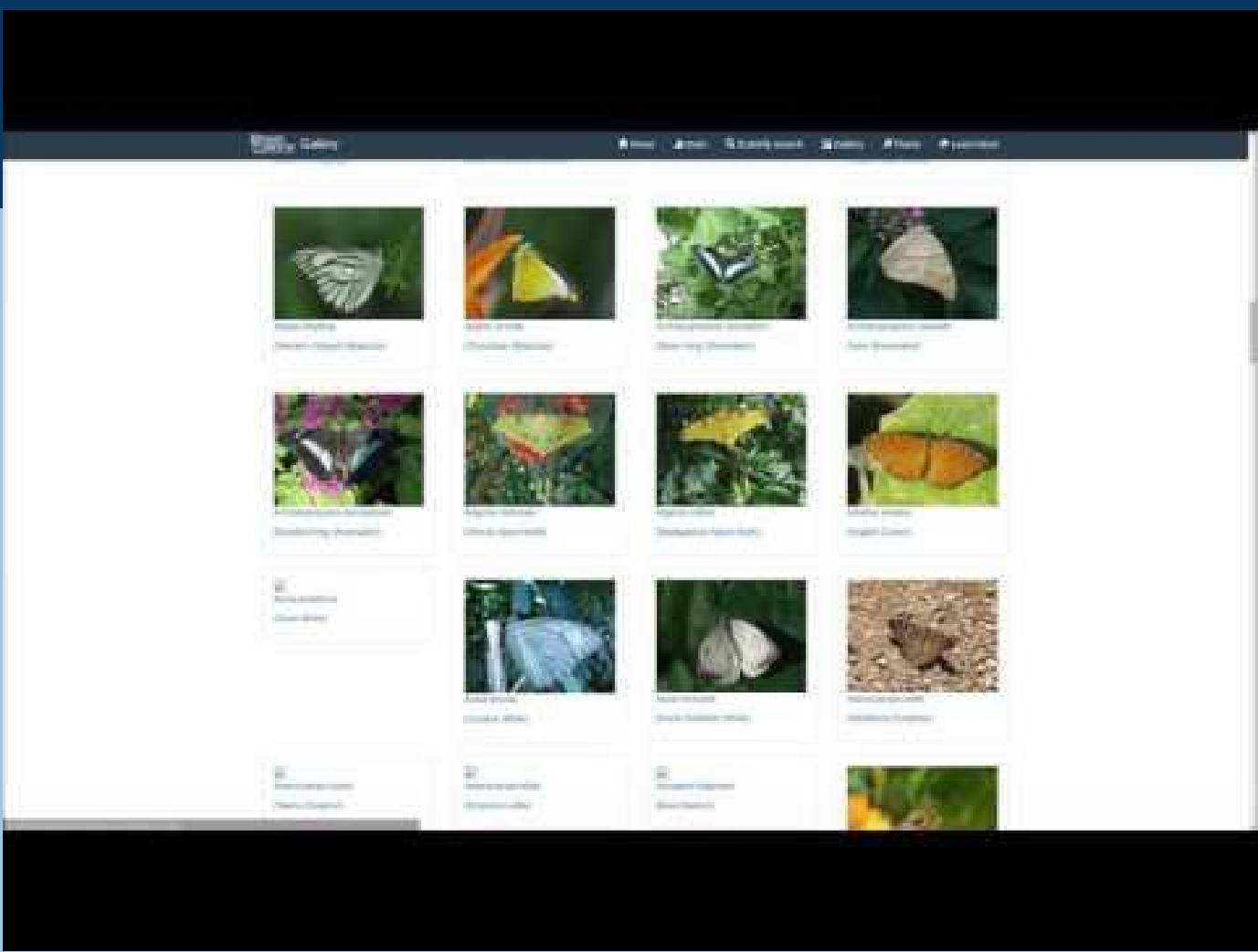


# Database Schema - Additional Tables



- Store extra information
- No primary relation to other tables
- Future functionality





Shipment Date	Actual Date	Supplier	Species	Carton Name	Number Received	Emerged in Carton	Damaged in Carton	Discased	Packages	Pup Emergence	Mo Emergence	Released
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Egg Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	2	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0
12/01/2019	12/01/2019	LFS	Stethocnema demissa	White Emergence	5	0	0	0	0	0	0	0

12/01/2019

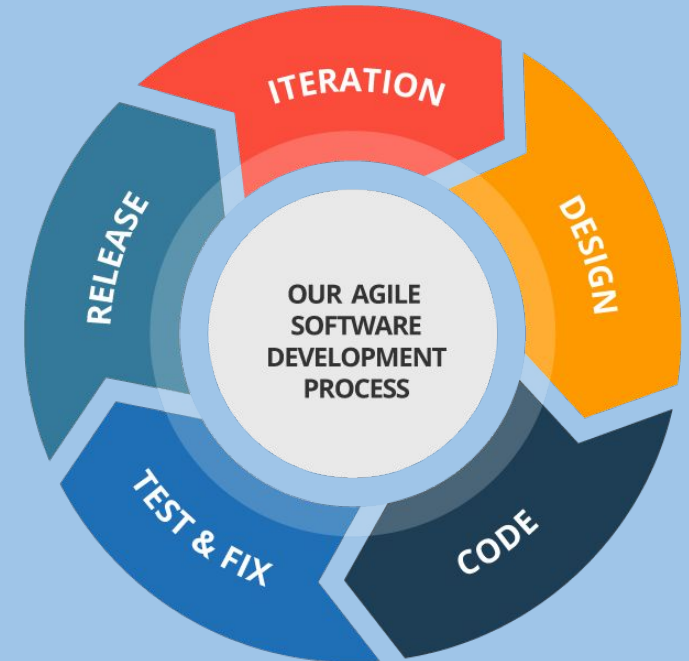
Print Report

Export Data

Export Data

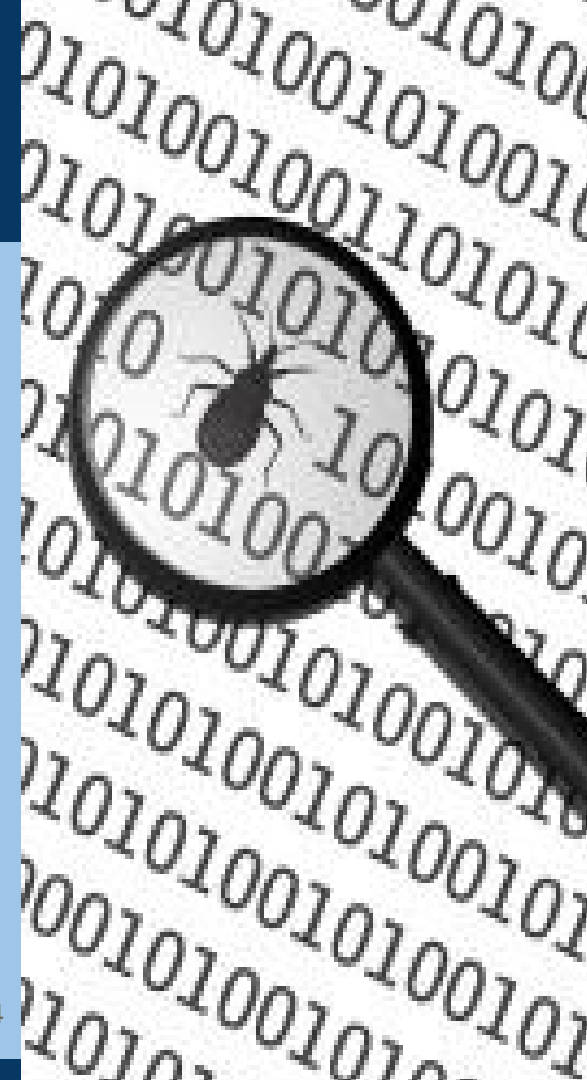
# Development Methodology

- Agile model
  - 2 week iterations
  - Stand-up meetings Monday & Thursday
- Story tracking done on Trello
- Regular communication through Slack



# Testing

- Developers run local servers
- All code is peer reviewed and tested locally prior to being added to the master branch.
- Routinely meet with the client to demo and show off what we have so far
- Test server for user to interact with and provide feedback on
- Future testing will involve functional and negative testing



# Maintenance and Continued Development

## Who

- Nicholas - Still in Ames
- Michael - One more semester left
- Megan - Continuing at Iowa State
- Scott - Working at company in Ames

## What

- Auto-generated labels/content
- More plant content, learn more page
- Integration between plants and butterflies components
- Social media interaction

# Conclusion

- Continued Development
- Created a product that enhances the Wing
  - Original functionality
  - Intuitive visitor-side
  - Little training for record entry
- Deployment
  - Next week on kiosk
  - Internet
- Questions?

