

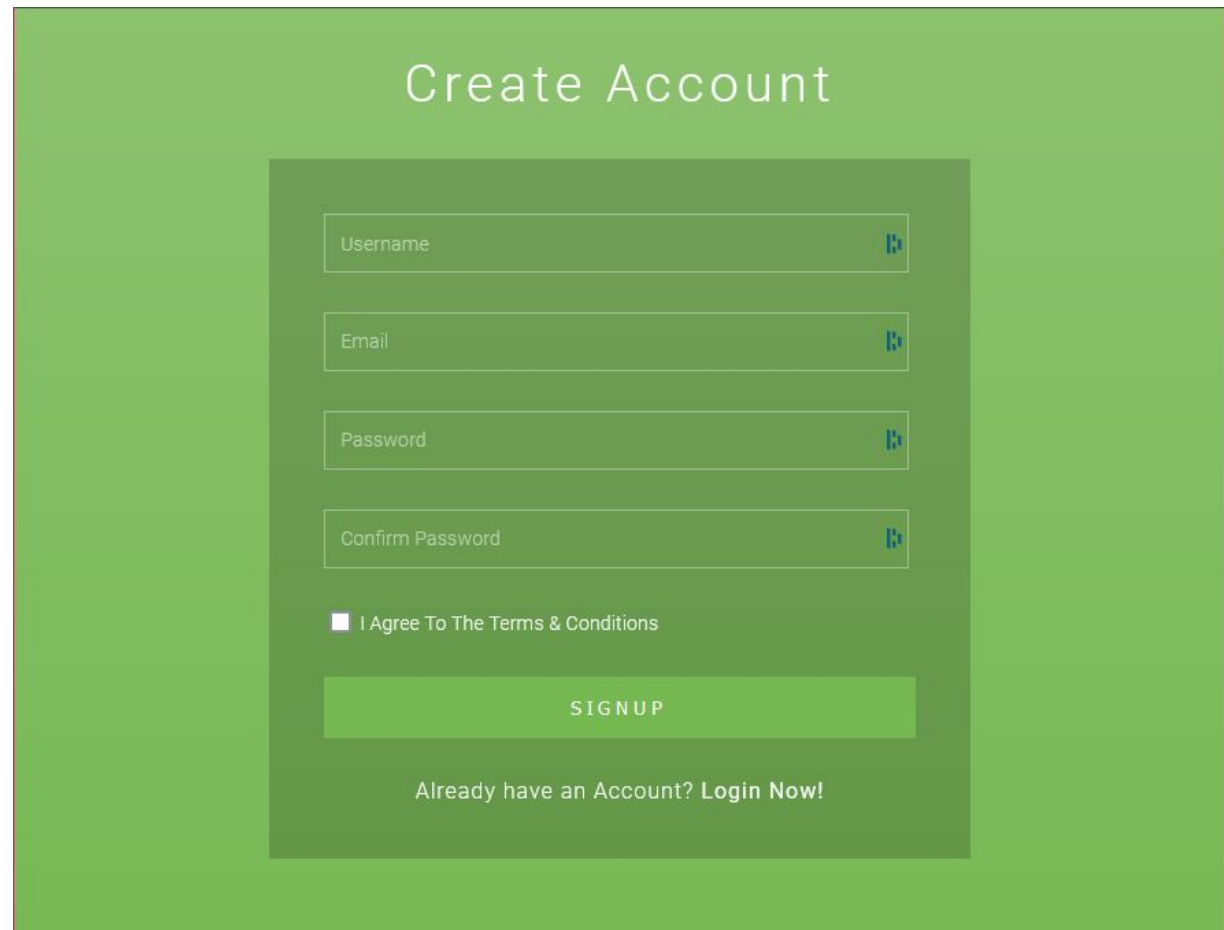
Introduction

- Target customer: Mahesh Prasanna
- Goal: An application that tracks users' farm data to help them maintain and monitor their assets
- Product: A web application that monitors Arecanut farm management through features like plot information, rainfall data, water tank reservoirs data, irrigation schedule, and other agricultural aspects
- Software Stack:
 - Front-End: HTML/CSS
 - Database: MySQL
 - Back-End: Flask with Python
 - Deployment: Heroku

Motivation

In India, Arecanut is cultivated in 400,000 hectares of land with a production of nearly 5 Lakh Tonnes. It has commercial and economical importance not only in India but also in China and Southeast Asia. Arecanut farms are generally not confined to a small area of land. On the contrary, every farm is spread across a wide area having multiple plots of several acres each. Hence, manually monitoring and maintaining the various agricultural aspects of the farms becomes a huge task for the farmers. In addition to this, during the summer, the majority of the farmers face scarcity of water mainly because of the mismanagement of water resources and it will be difficult to supply the required water to the palms. Hence, water management is very crucial for the farmers so as to use technology to irrigate their farms throughout the summer with the water available.

User Authentication Pages



Create Account

Username

Email

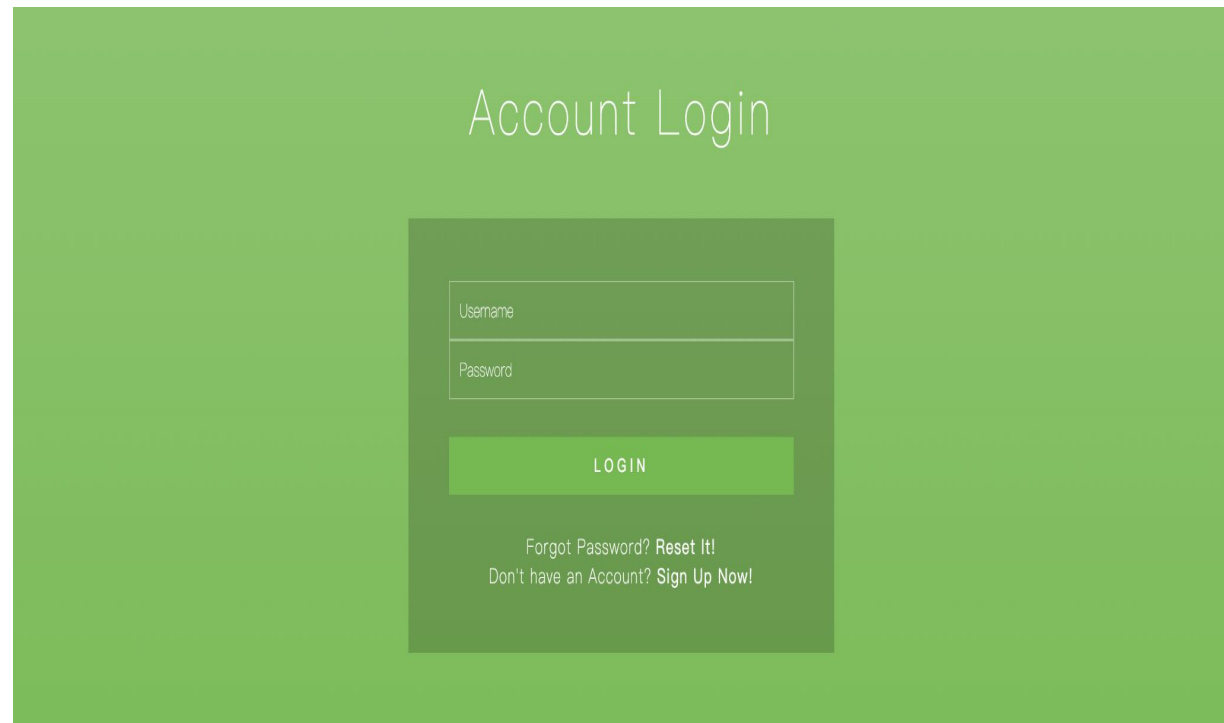
Password

Confirm Password

☐ I Agree To The Terms & Conditions

Already have an Account? Login Now!

This page is for new users to Sign-Up/ Create their account



Account Login

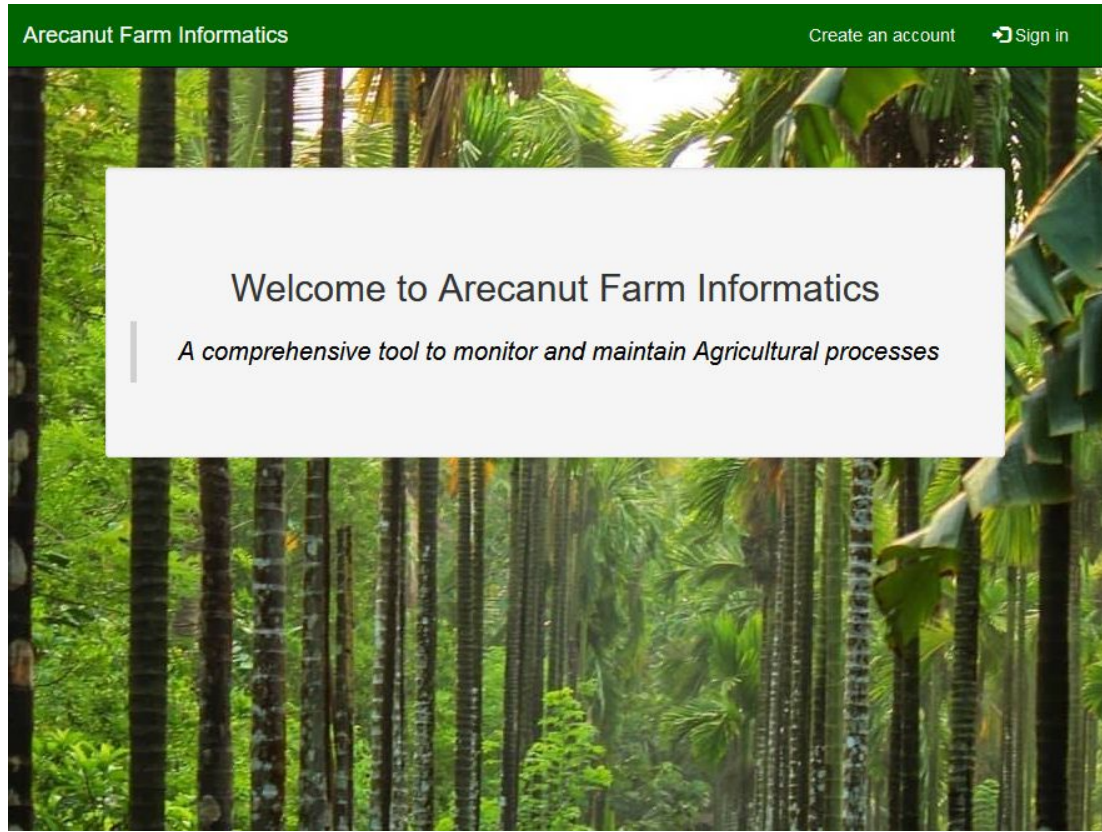
Username

Password

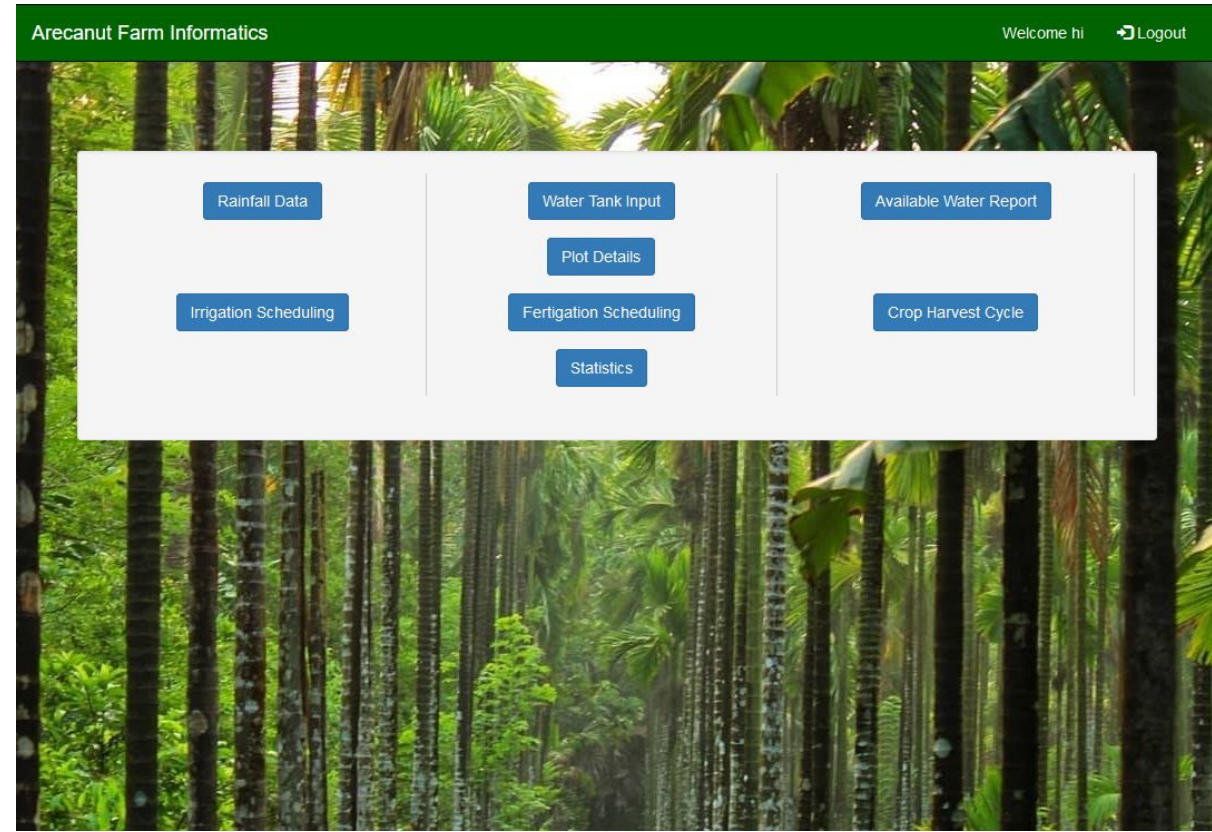
Forgot Password? Reset It!
Don't have an Account? Sign Up Now!

This page is for existing users to Login to their account.

Home Pages

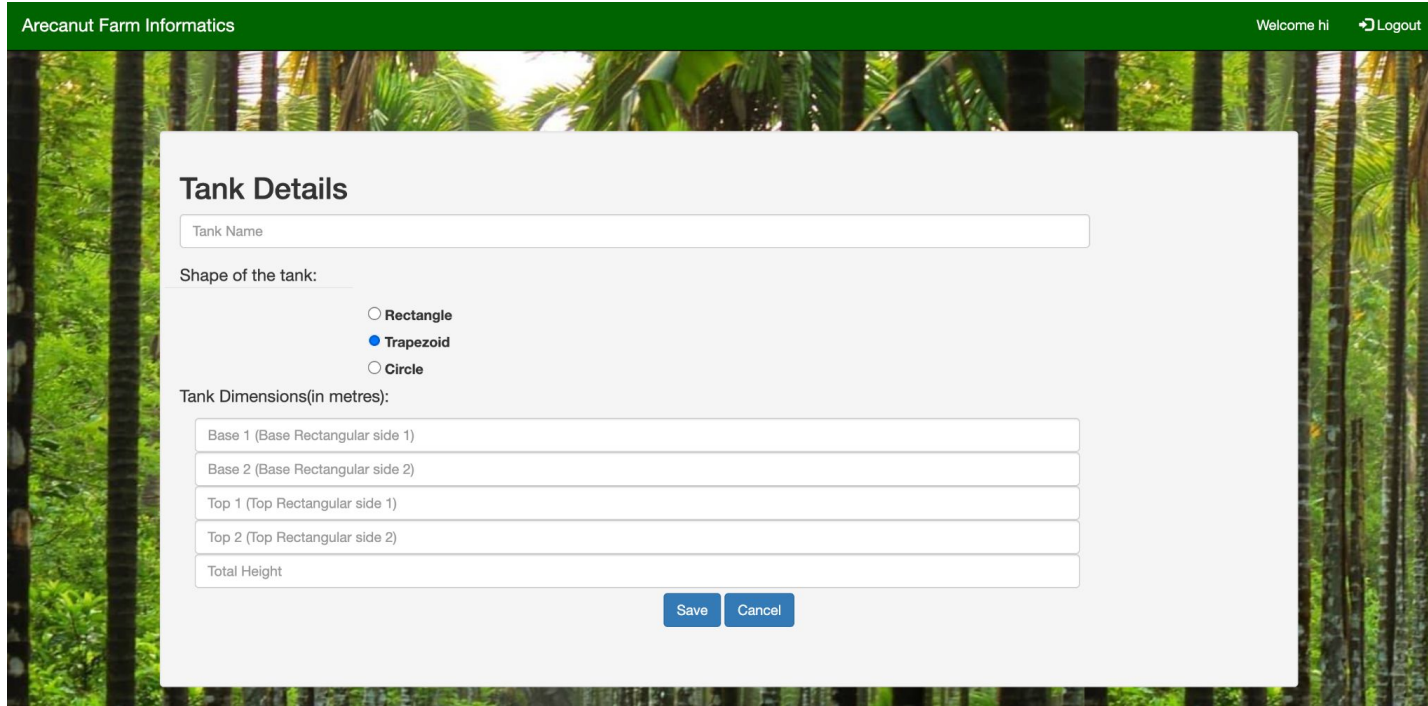


Home page of the application with Login and Sign-Up options as well as some basic info about the application.



Landing page post login showing current functionalities and some placeholder functionalities for future work.

Farm Data Tracking and Management Pages



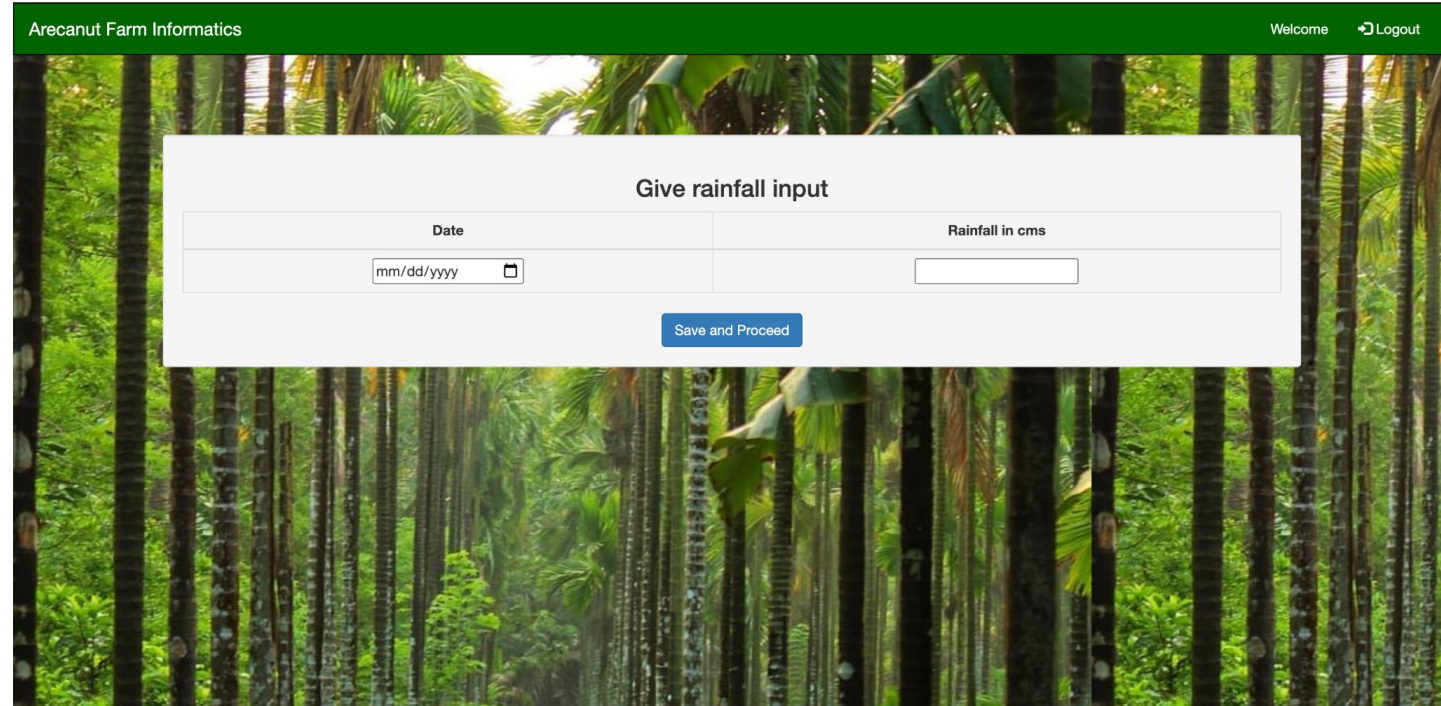
Tank Details

Tank Name

Shape of the tank:
☐ Rectangular
☒ Trapezoidal
☐ Circle

Tank Dimensions (meters):
Base 1 (Bottom Rectangular side 1)
Base 2 (Base Rectangular side 2)
Top 1 (Top Rectangular side 1)
Top 2 (Top Rectangular side 2)
Total height

This page allows to add water tank input by selecting shape and accordingly add measurements.

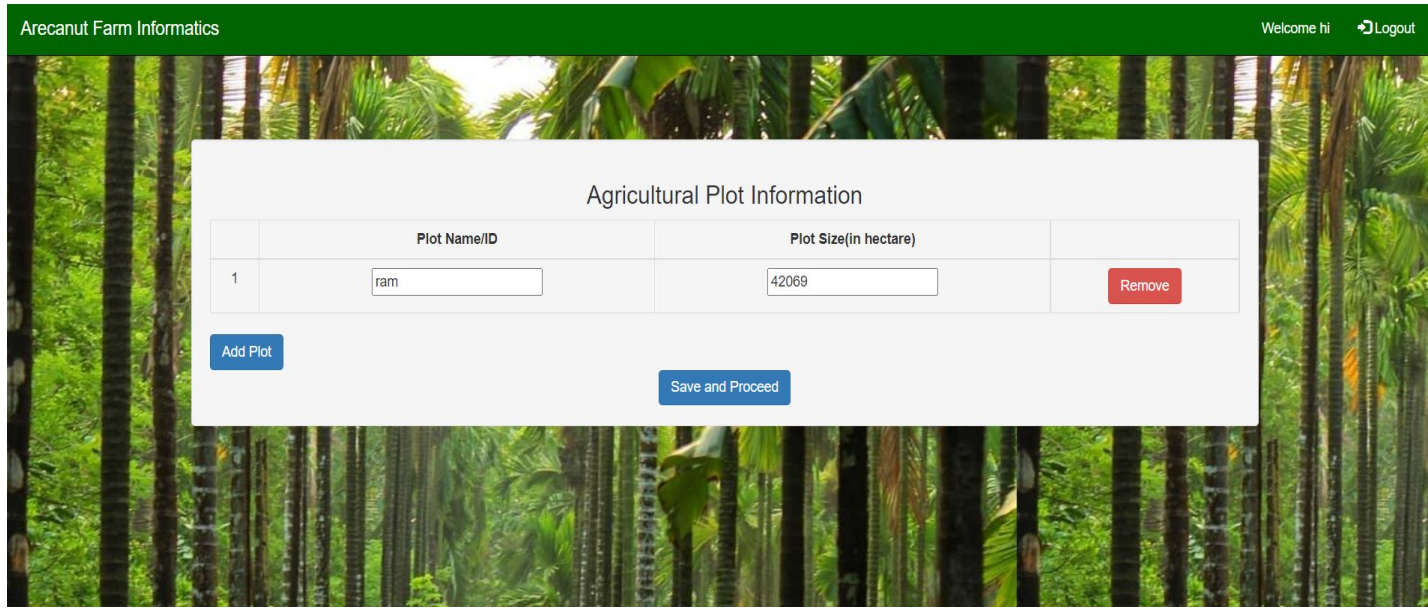


Give rainfall input

Date

Rainfall in cms

This page allows to add past or current day rainfall measurement (in cm) to maintain track of it.

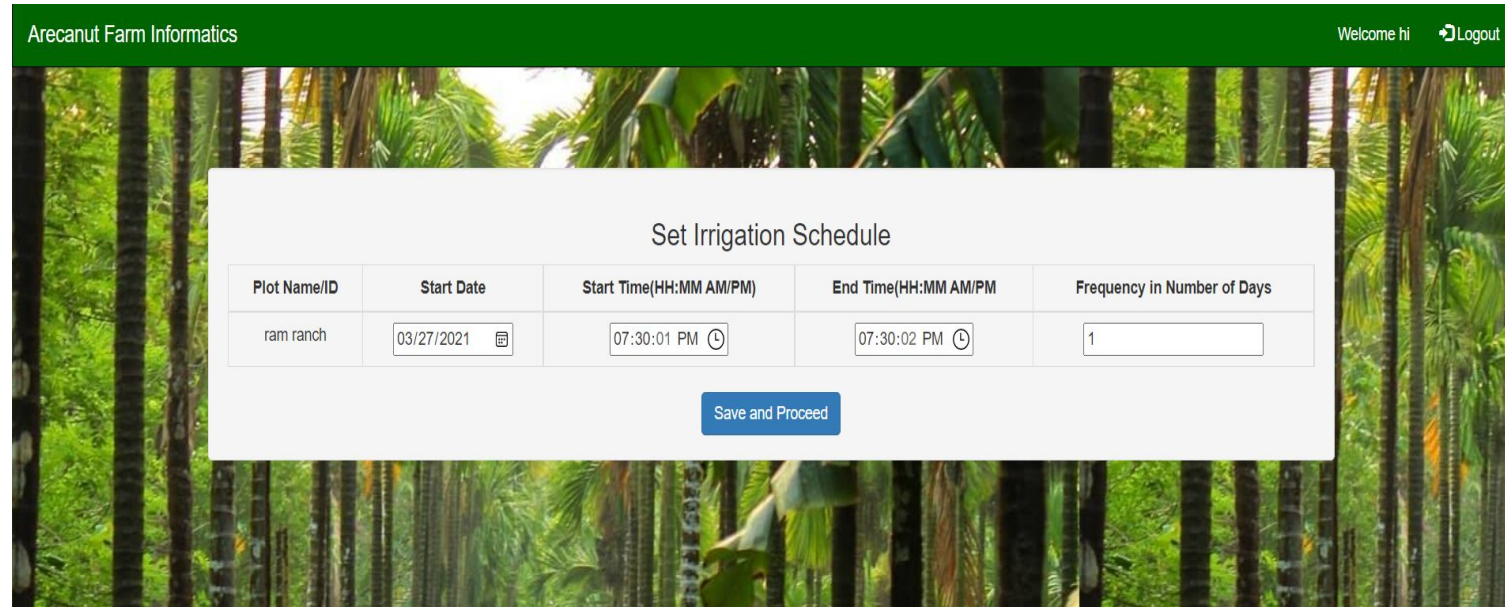


Agricultural Plot Information

Plot NameID

Plot Size(in hectare)

This page allows to Add/Delete plot information and then proceed to next page (on right).



Set Irrigation Schedule

Plot NameID	Start Date	Start Time(HH:MM:AM/PM)	End Time(HH:MM:AM/PM)	Frequency in Number of Days
1am10000	10/27/2021	07:30:01 PM	07:30:02 PM	1

This page allows the user to schedule alerts for periodic irrigation of each plot.



Sample email alert for irrigation scheduled by user.

Design Choices and Overall Flow

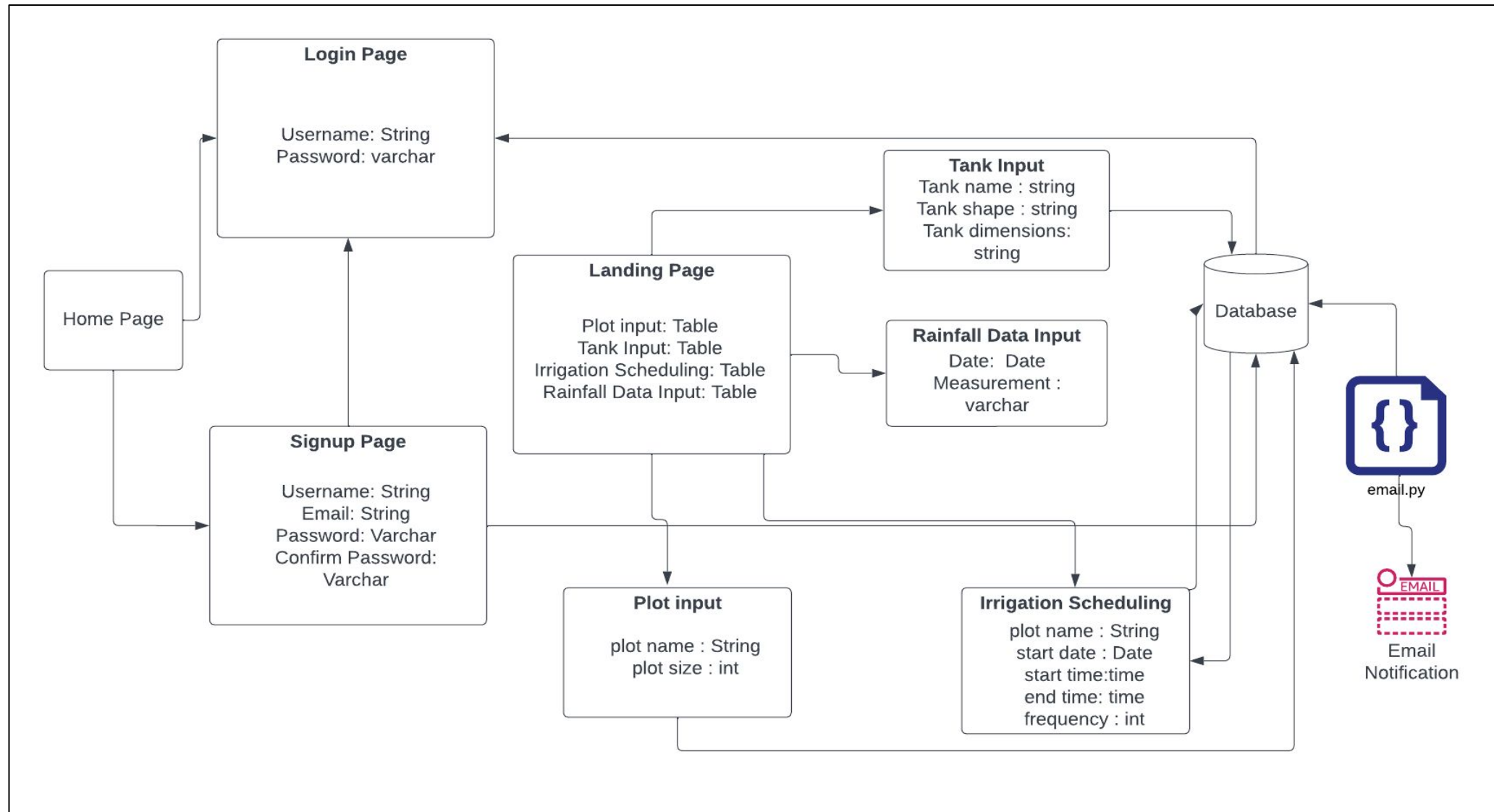
BUSINESS: The goal of the application was to aid and help end-user (farmer or manager) to track and manage farm data for which above mentioned functionalities were essential. So the design fulfilled the business use case and caters to end-user.

- Having a basic authentication(login and sign-up) helps track the basic user data and respective farm data with ease. The placement of these options in the header helps user focus on the bigger goal to be interacted with the user and later proceed to authentication.
- Having a singular landing page with the available functionalities helps user to navigate conveniently using the application interface, easing the overall usage.

DESIGN: The subjective design decisions taken were in accordance to existing knowledge of the domain of implementation and customer input. Some such decisions were:

- Green based color scheme throughout the application to emphasize the domain of implementation: Farming
- The background image in all pages and the well-structure was to aid user to focus on the form to fill to avoid clutter with any background image and avoidance of solid color background to bring more visual focus to the form with the separation from background image as well as maintaining uniformity across.
- Upon entering plot details, in order to schedule irrigation the page for the same was a continuing page in order to ensure user enters irrigation scheduling details for each plot, this ensured flow of user actions and information.

UML Diagram of Overall Design



Challenges and Lessons

- Effective utilization of Agile methodology: Thorough planning anticipated a much more extensive product in the beginning of development, but we failed to foresee the workload and some roadblocks faced. that came with this end goal as a result of miscalibration. We initially planned our entire project out from the beginning and did not fully take advantage of the agile process in that we did not adapt our weekly scrums and also more extensive tracking using pivotal type of tasks could have been used.
- Lack of multiple end-user feedback meant the page designs and UI choices were contained within the team and the client . Not accounting for this in our process was a bit of a drawback since varied user inputs were not accessible and on our part as it led to us tunnel visioning our final product.
- Keeping descriptive user stories was another challenge that we faced with the software engineering process. User stories were somewhat vague sometimes, leading to confusion on what was to be accomplished specifically within the team.