Design Review III

DENDRO-DAWGZ

Growing A Brighter Future

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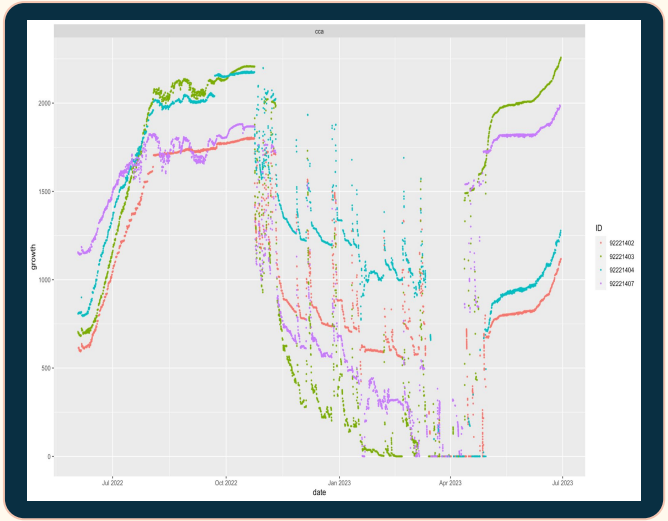
Problem Statement

- Must use laptop while in a tree
- Have two use two hands
- Not the most reliable software
- Can only view one dataset at a time
- Have to share data via google drive

Solution Overview

- Develop an Android application
  - Portable and affordable
  - Able to use with one hand
- Display several dendrometers on the same graph
  - Interactive graphs
  - Comprehensive data
- Export data to the cloud
  - Data and file sharing
  - Viewable from anywhere



Requirements

Functional

- Obtaining data from a dendrometer
- Visualizing data from a dendrometer
- Sharing data over the cloud

Environmental

- Android application
- Wired connection through TMD Adapter
- Restriction to C and Java FTDI libraries

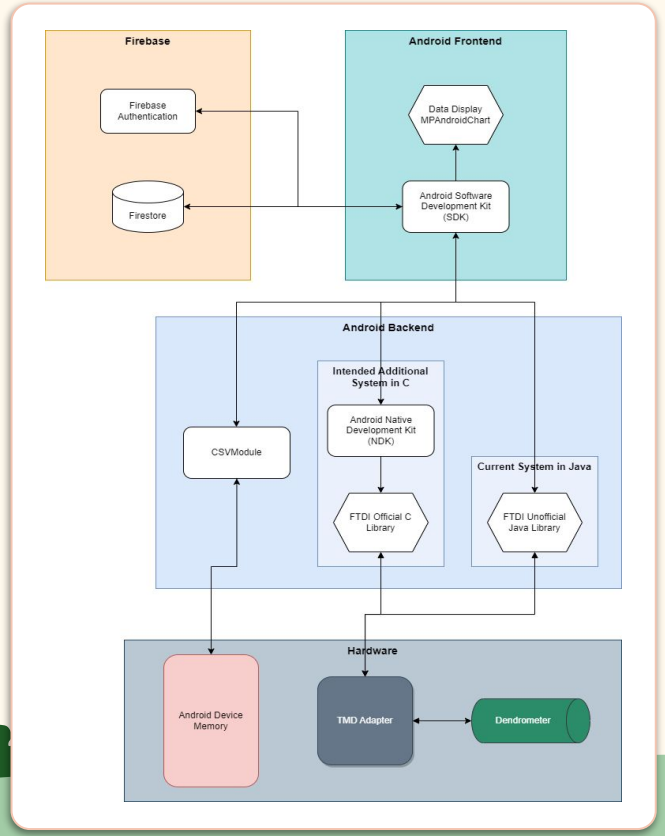
Non-Functional

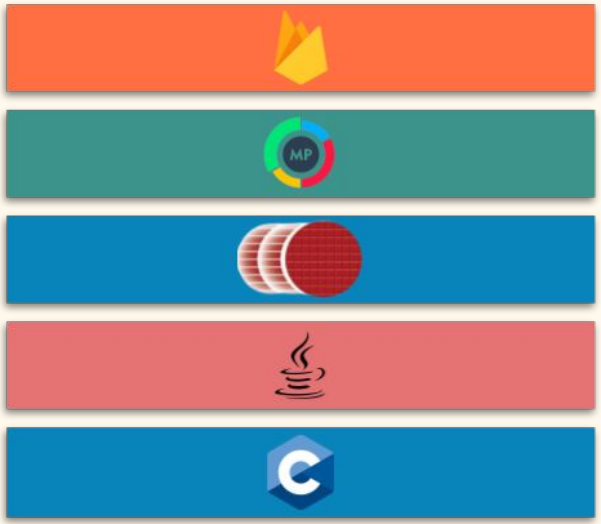
- Swift download and graph rendering times
- Interactive graphs and intuitive UI
- Secure data storage

Obtaining Requirements

- Weekly client meetings and emails

Architectural Overview

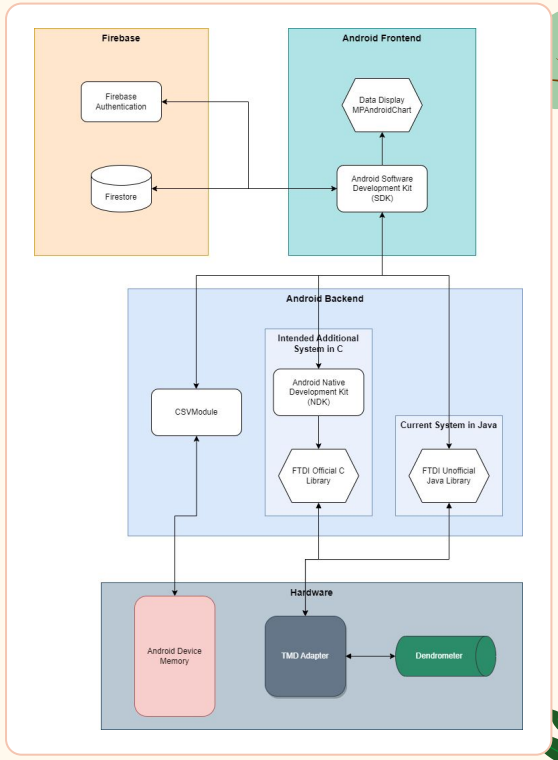




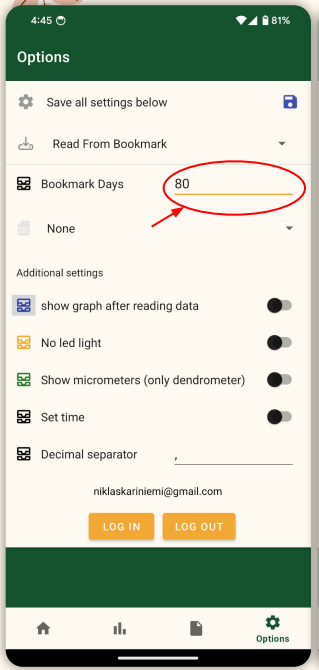
Implementation Overview

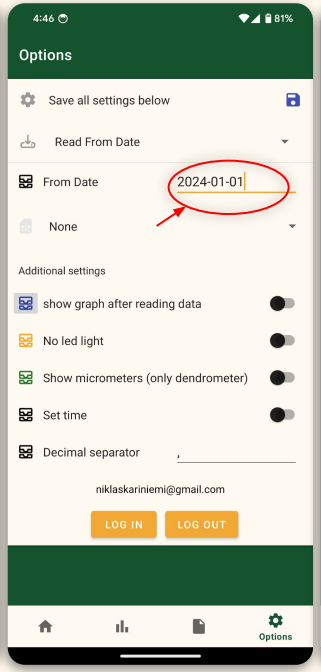
- Core features of the application are implemented
  - Android application developed
  - Hardware connection and complete data retrieval
  - Merging several datasets together
  - Data visualization of both singular datasets and merged datasets
  - Authenticating users
  - Uploading data to a cloud database
  - Sharing data between users using the cloud

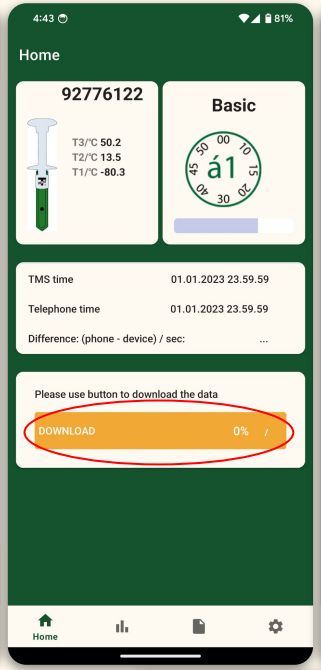
- Additional features
  - Graph visualization of data analysis
  - Testing the software and monitoring for bugs
  - Implementing user feedback from usability tests

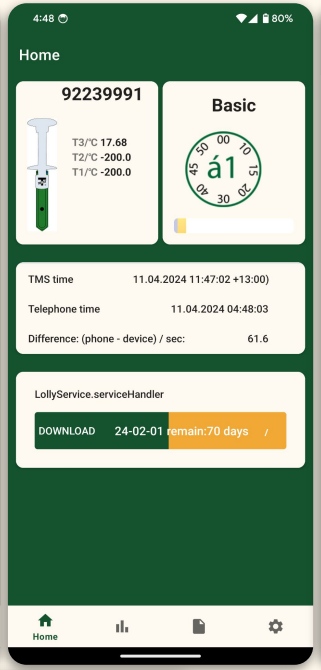


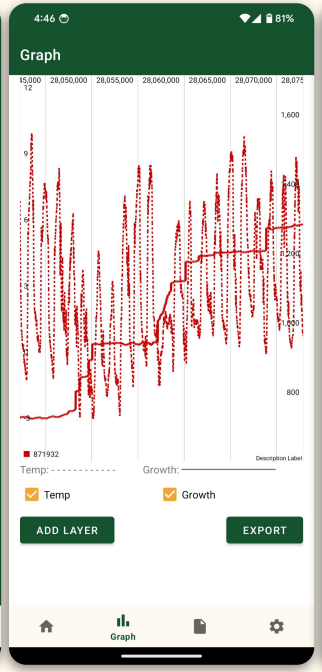
Downloading Data



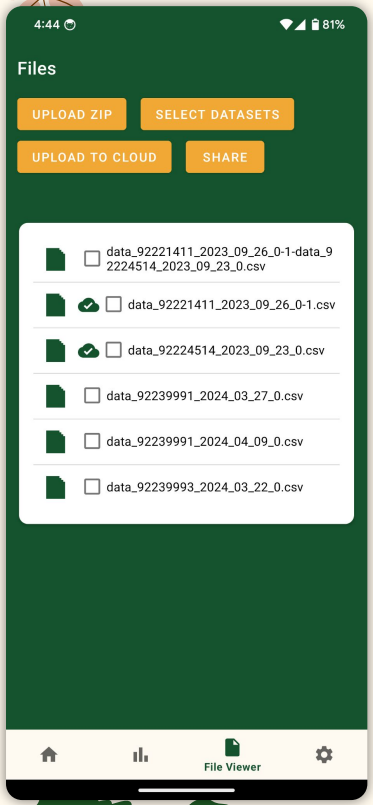


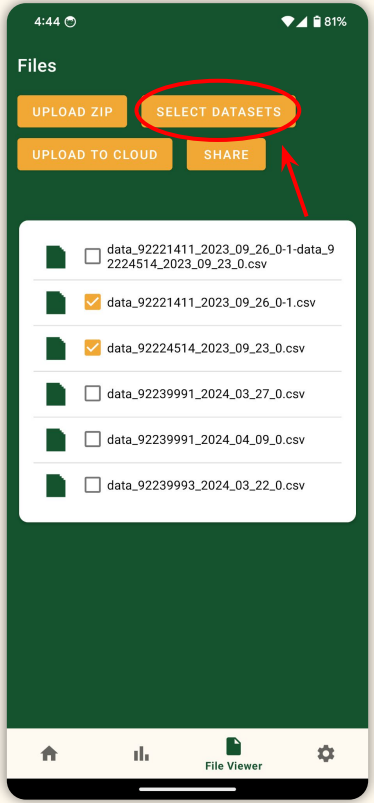


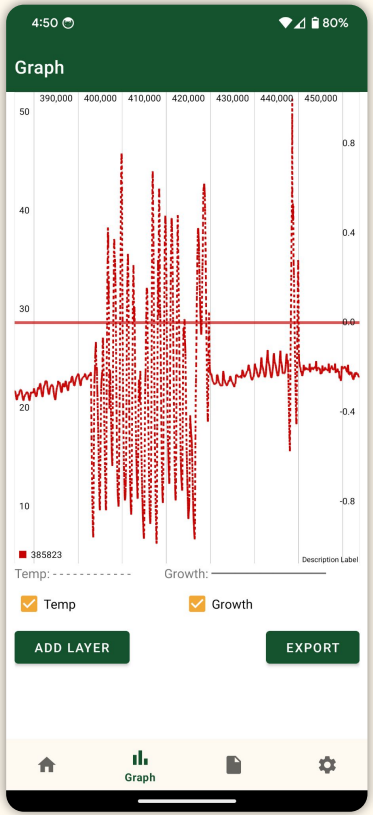


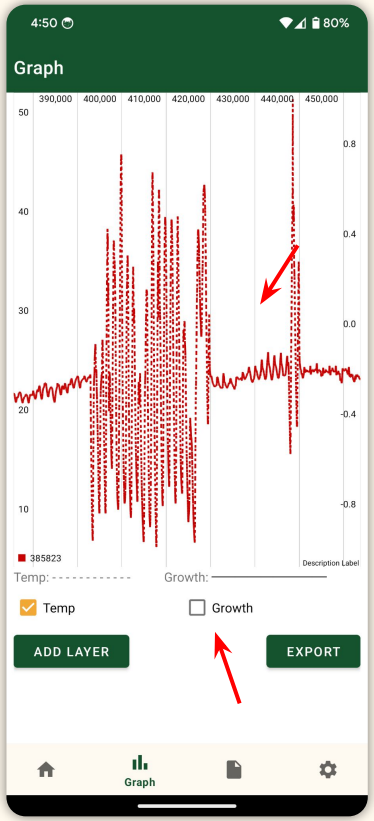


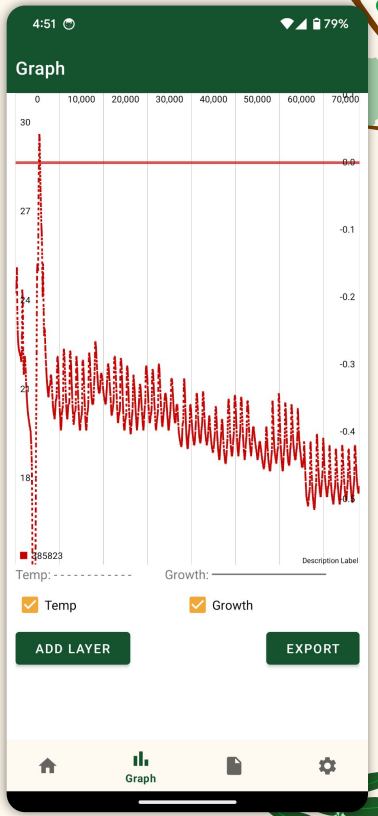
Visualizing Data



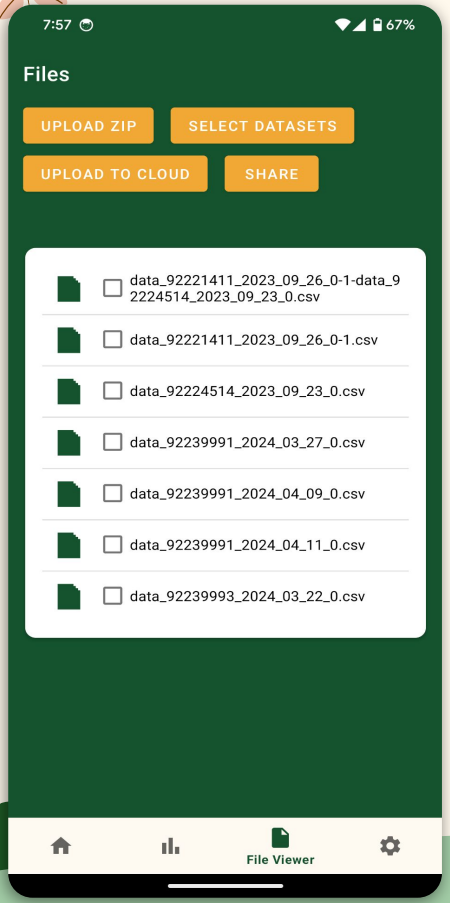


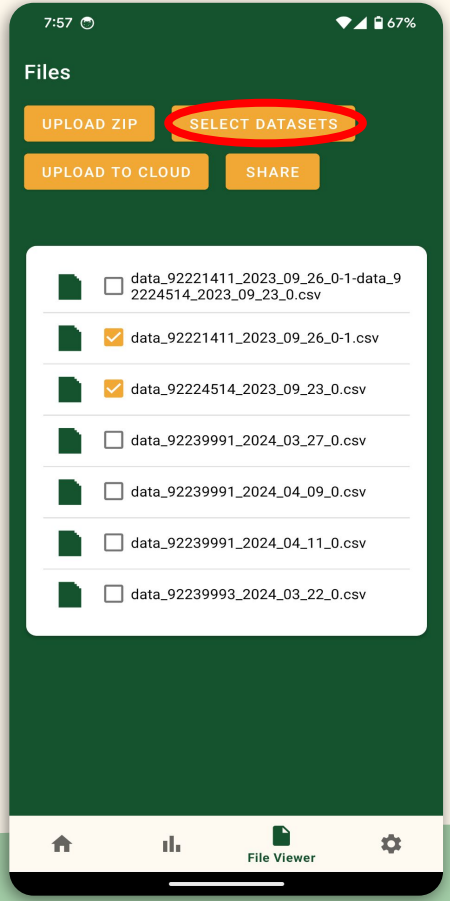


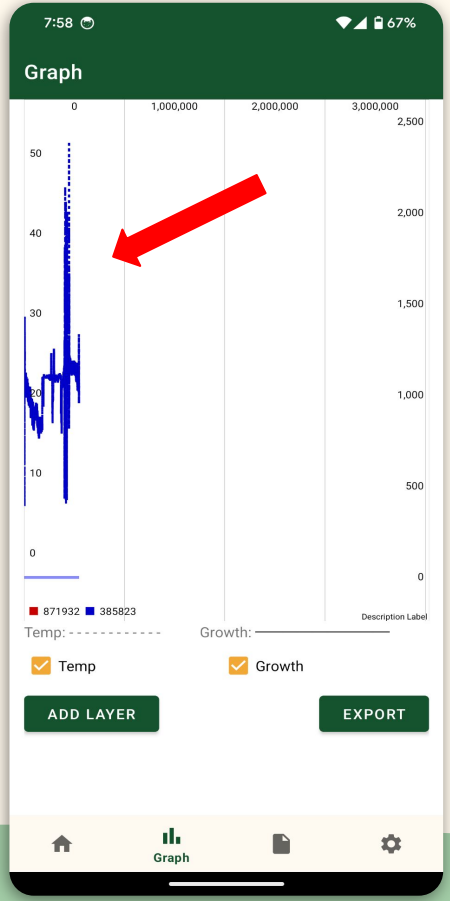


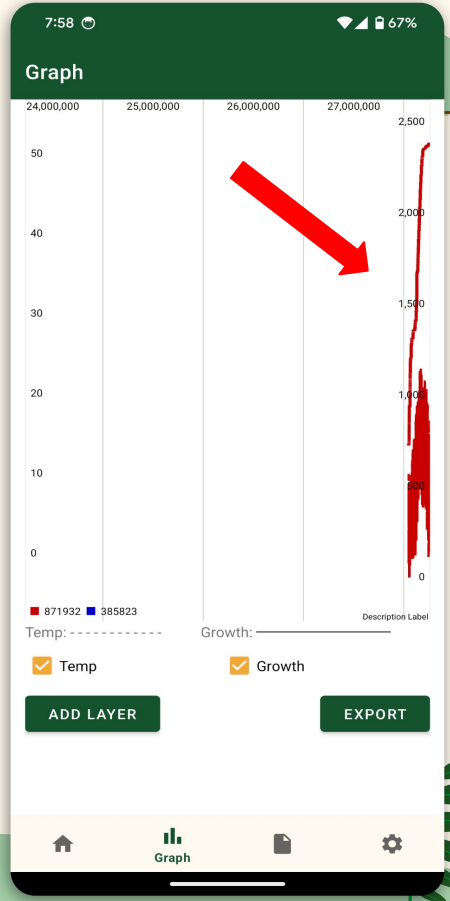


Merging CSV Files

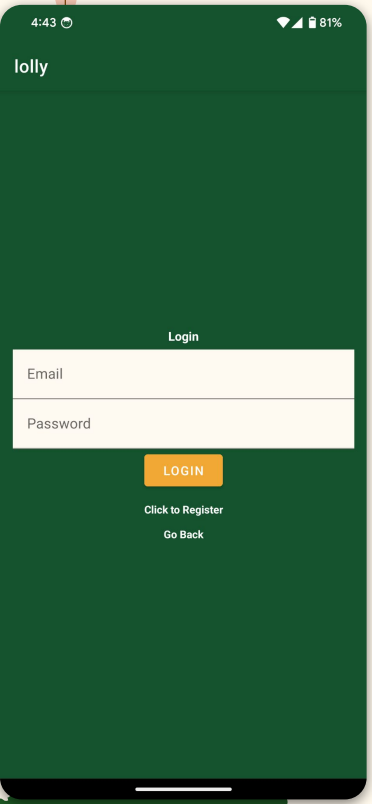


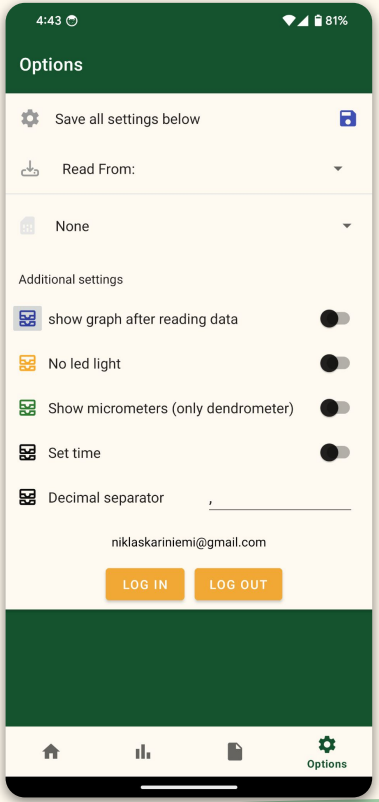


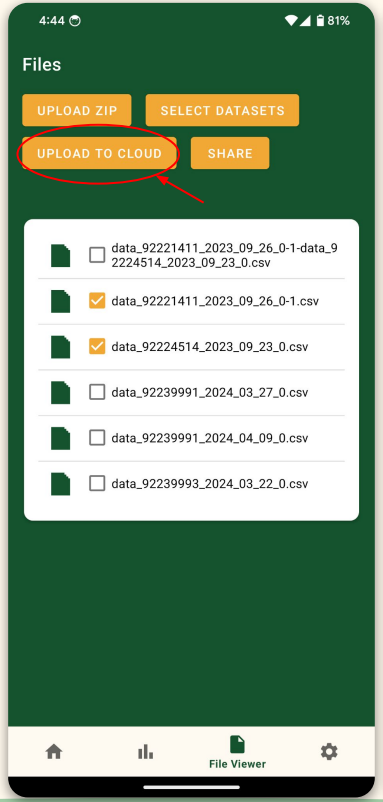


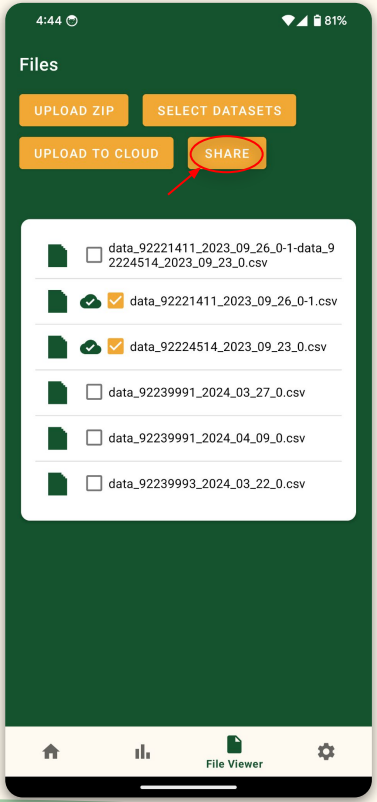


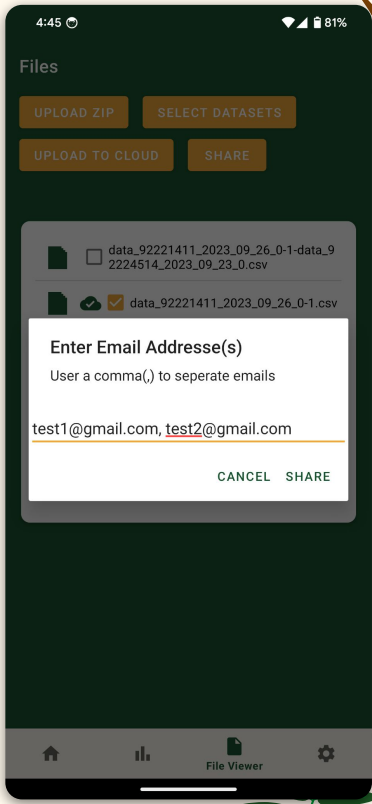
Cloud Export







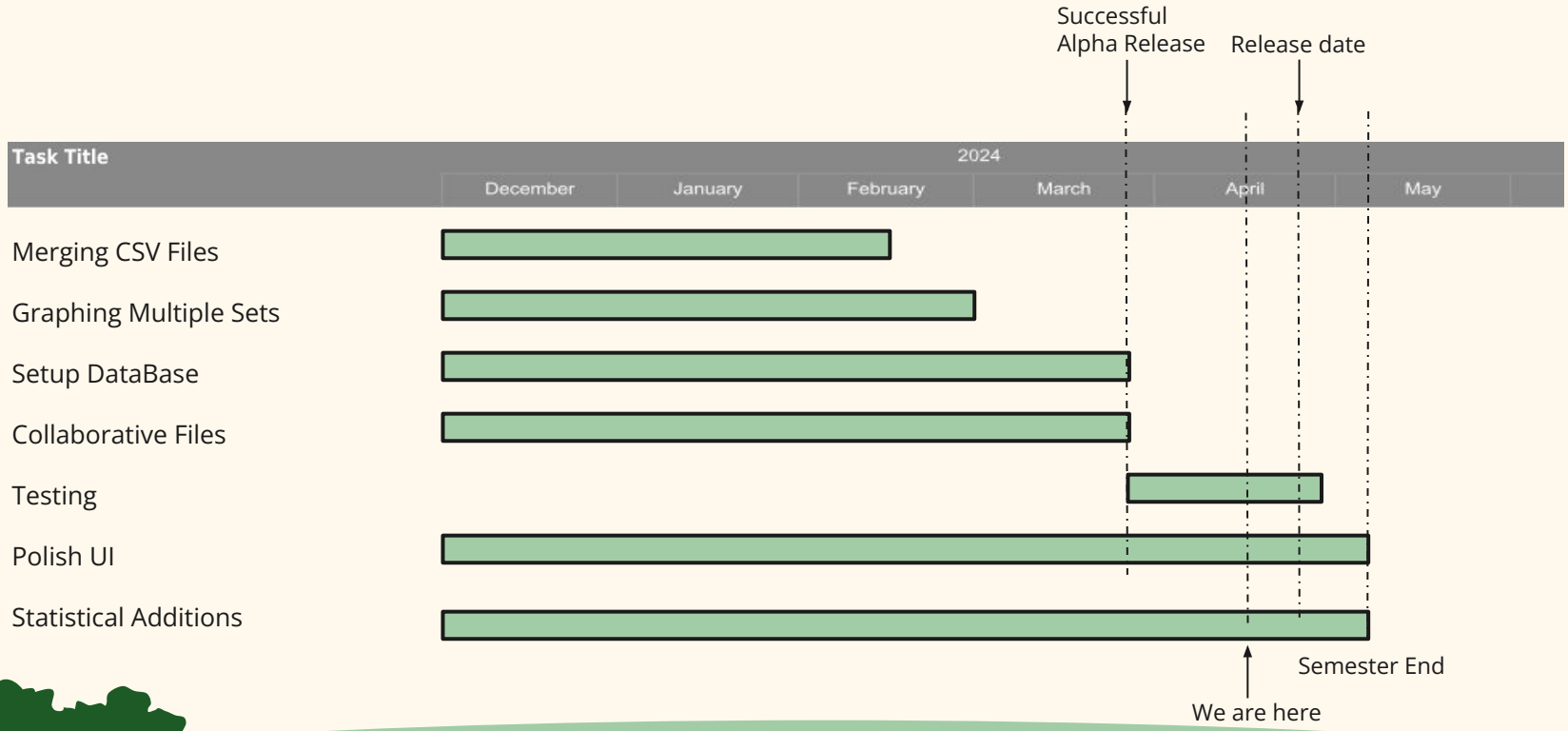




Challenges and Resolutions

	Merging	Graph	Cloud	Backend
Challenge:	Support two file formats our clients use; support files from Lolly software (for Windows)	Graphing times increase with number of entries.	Uploading a csv file to a database would require uploading every single row and column.	Acquiring all device commands, and accessing device functions using them
Resolution:	Provide dedicated functions for converting between formats; use additional methods to find serial number	Parallelize display function	Use cloud storage instead of a database. Allows for uploading csv files.	Got proper command list from TOMST engineer and got advice on implementation

Schedule


Successful
Alpha Release
Release date
Task Title
2024
December
January
February
March
April
May
Merging CSV Files
Graphing Multiple Sets
Setup DataBase
Collaborative Files
Testing
Polish UI
Statistical Additions
Semester End
We are here

Testing Plan

Unit testing

- pars.java
  - Used to parse incoming data
- CSVFile.java
  - Used to interact with filesystem and change files
- GraphFragment.java
  - Used to visualize data from dendrometers
- ListFragment.java
  - Used to populate list in File Viewer page

Integration testing

- Visualizing and merging data
  - Visualizing small and large datasets, and merging them
- Login Flow
  - Passing user data across different views

Usability testing

- Data reading
  - Data download is straightforward
  - Bookmarking and reading from date
  - Info presented to user is useful
- Visualizing data
  - Able to navigate to File Viewer page
  - Easily able to select/deselect files
  - Can navigate straight to the button
- Merging data
  - Merging is intuitive
  - Converting file formats is easy
  - Finding the file select page is easy
- Exporting data to the cloud
  - Able to easily navigate to File Viewer page
  - Intuitive on how to select files
  - Easily understood on how to upload files

Conclusion

Our clients want a **better solution** to the current way of collecting data from dendrometers. Having to carry a laptop into a tree makes process harder and more dangerous

We will create a mobile application for Android which will have the ability to **read** in data, **store** data, **merge** data, **visualize** data, as well as **share** data with others using a cloud solution

We asked our clients about what the app needs to do, designed and reviewed with clients, identified missing pieces

We evaluated process for risks, feasibility, and other environment requirements

After this, we plan to focus on **finishing backend code**, **merging**, **visualizing**, **cloud export**, and **creating necessary UI elements** to show off for the final version

Clients are very happy with the work we have completed and it has been a great experience for us!

Thank You!