Team name: Six XY
Project name: Terrabox
Phase 1 Specification

Learning Objectives

Upon successful completion of Phase 1, the team will be able to demonstrate working hardware and software components that are able to communicate with each other. The project should have made significant progress and a barebones project should be functional enough to showcase the overall concept.

Deliverables

Software

1. Front End/UI Layout
    a. Design functional UI prototype for iOS app
2. Implement Frontend and Backend for iOS app
    a. Build a basic frontend that communicates with backend / firebase to set states based on user interaction
3. Connection between Raspberry Pi and Firebase
    a. Raspberry Pi will read from Firebase states to process information about what controls need to be adjusted
    b. For Phase 2 - If temperature, humidity, lighting, or watering, needs to be adjusted to certain levels, Raspberry Pi will compare live sensor data to Firebase state settings to adjust levels accordingly (via STM)
4. Embedded Level STM Code
    a. Setup base code for STM and test communication between STM and Raspberry Pi
    b. Develop working sensor and actuator wrapper code.
    c. Write overall system skeleton code with working individual components.

Hardware

1. Ensure all equipment components are functional on their own (sprinkler, humidifier, light, etc.)
    a. Ensure switch relay for lighting and water pump are functional
    b. Obtain an I/O diagram for sensors/pinouts/etc.
2. Connect Raspberry pi and STM together
    a. Ensure Raspberry Pi is able to read sensor data from STM
    b. Ensure STM is able to control actuators
3. Determine the byte pattern and communication protocol for communication between STM and Raspberry Pi
4. Start mounting components (the ones that have already arrived) onto the terrarium

Plan for Phase 2 and 3

Phase 2

Software:

- `Implement multi-user backend for instances where there are multiple accounts (Firebase will need to hold states for individual accounts)-
- Finalize UI on app, create more robust DB for user created presets and options for users to pair more than 1 device
- Add analytic tracking to another database

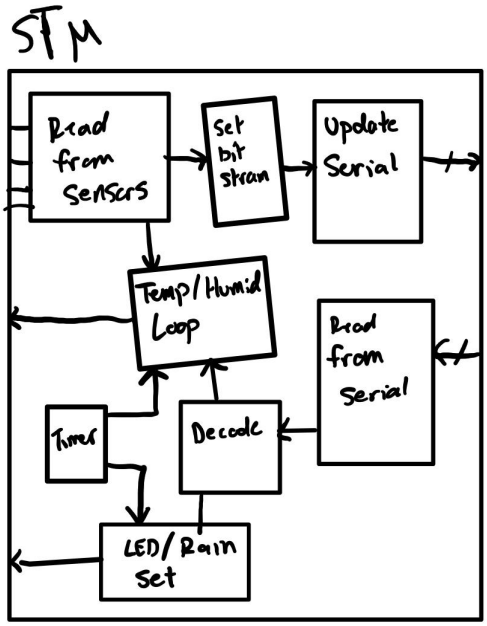
Hardware:

- If behind, integrate all system blocks to work together STM controlled by RasPi controlled by App
- Furnish hardware layout
- Hex displays of database states hooked up to raspberry pi pinouts

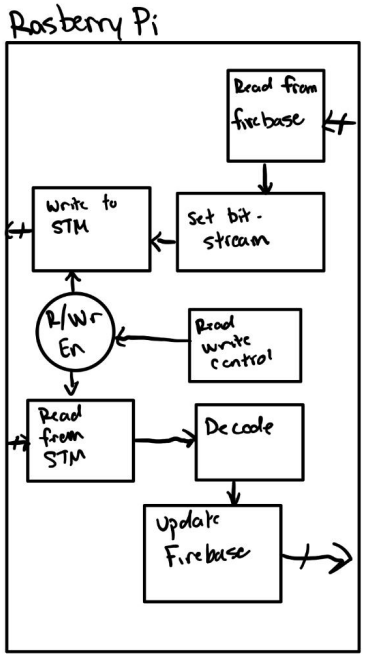
Phase 3

- Eliminate all bugs, polish housing for hardware for finalized prototype, create edge case tests and user tests for app to discover any issues, reach out for fundraising

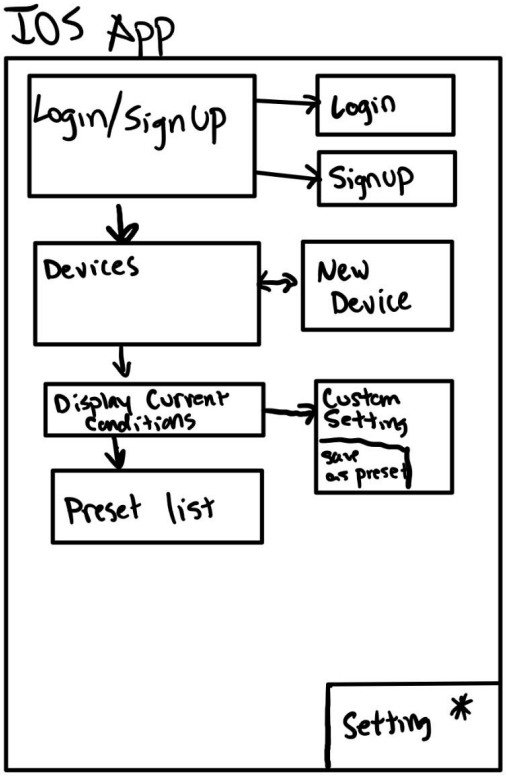
Appendix



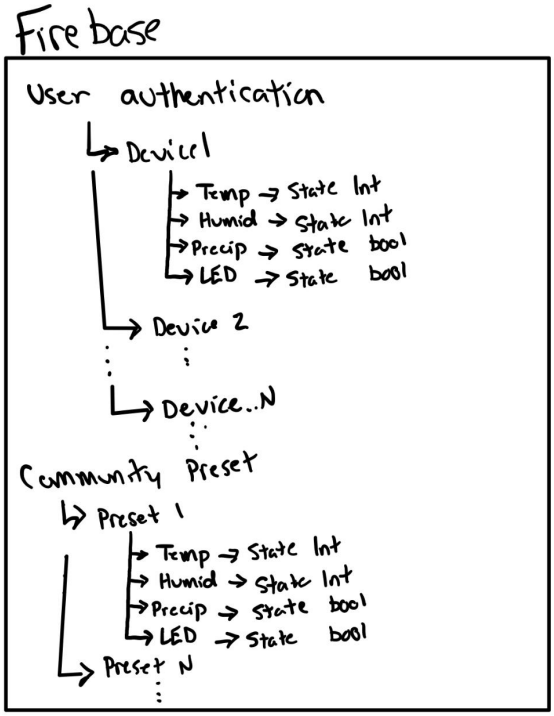
Appendix B: STM Block Diagram



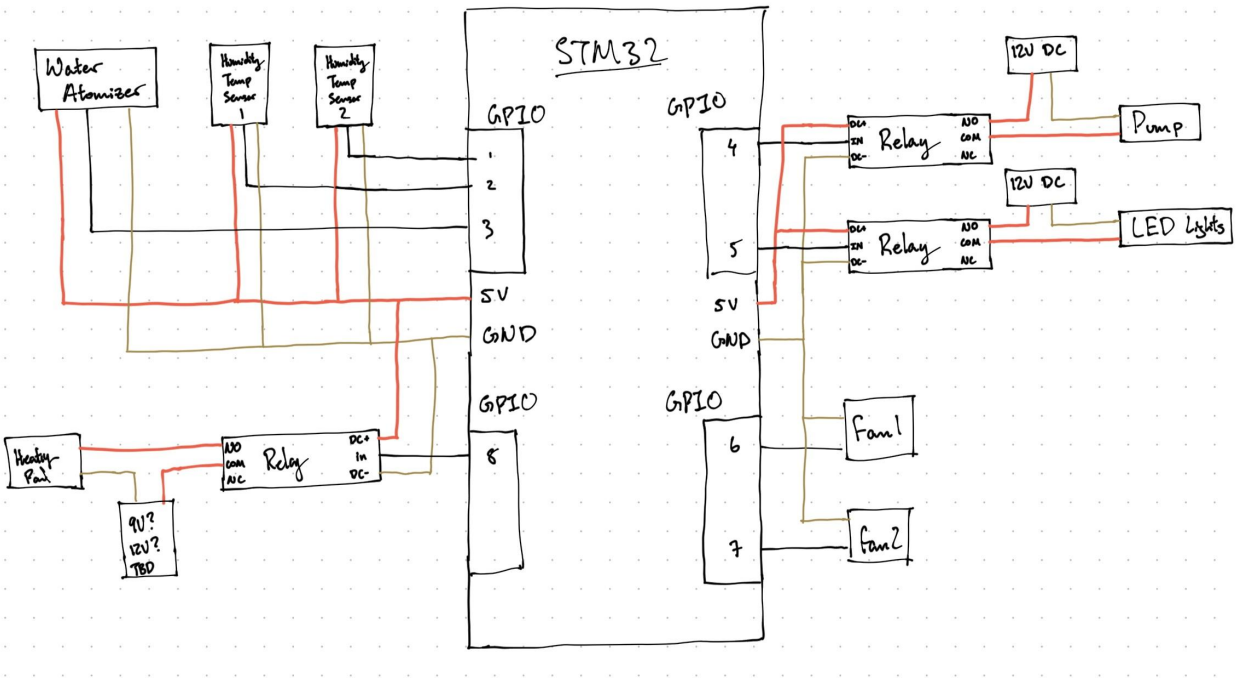
Appendix C: Raspberry Pi Block Diagram



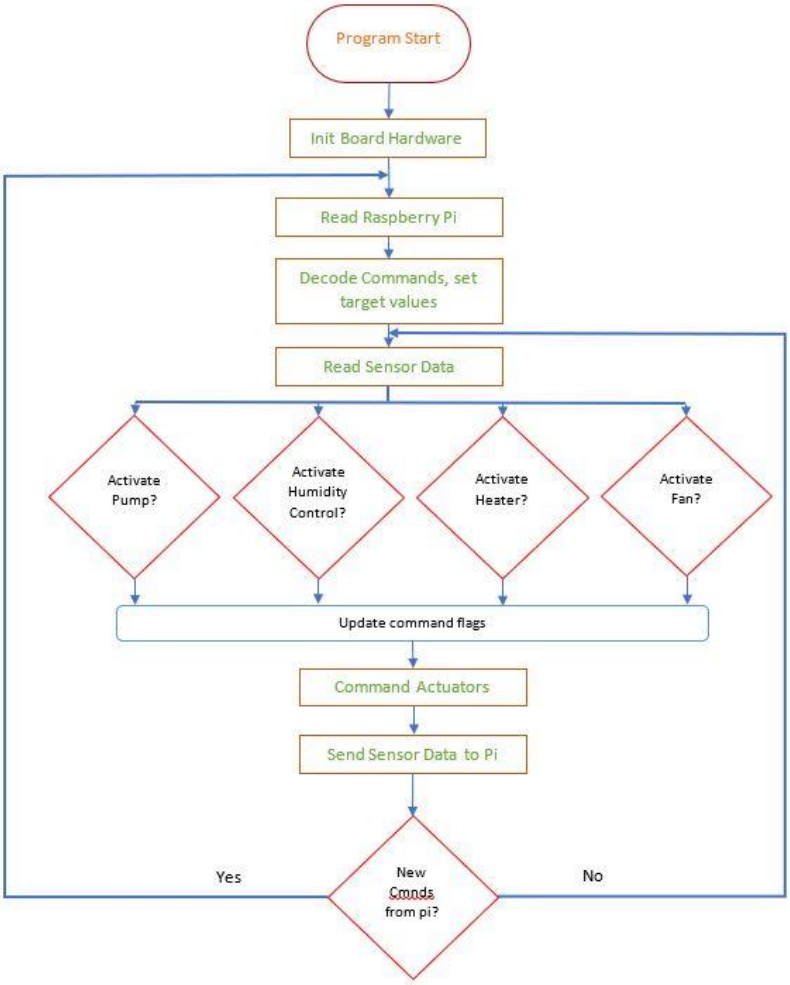
Appendix D: IOS App Block Diagram



Appendix E: Firebase Database Data Layout



Appendix F: STM Pinout Diagram



Appendix G: ASMD Chart for STM Program