IOT Final Project
Smart Alarm Clock

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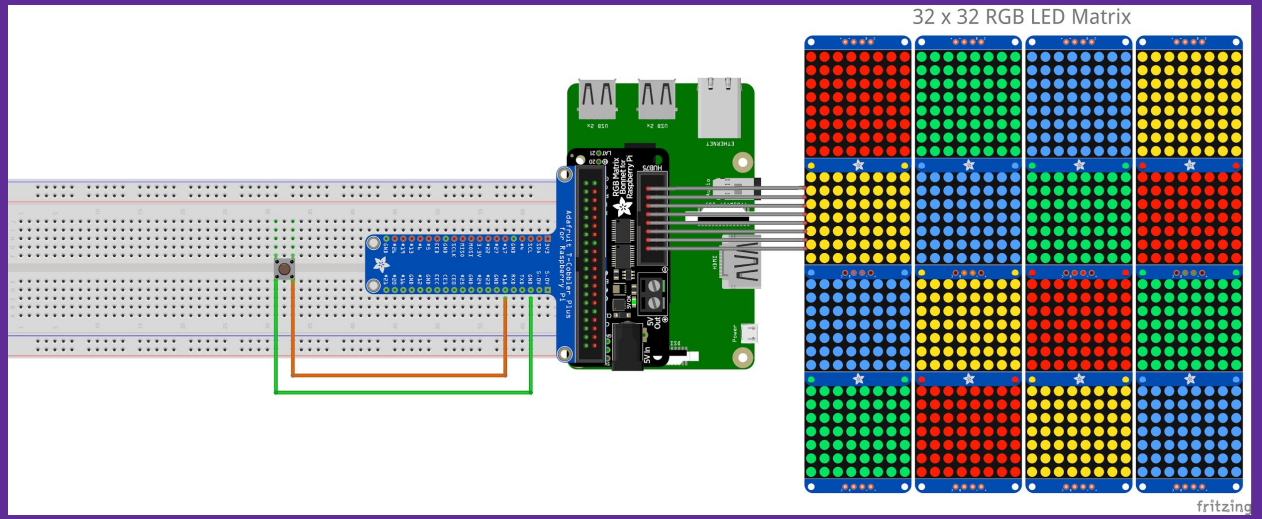
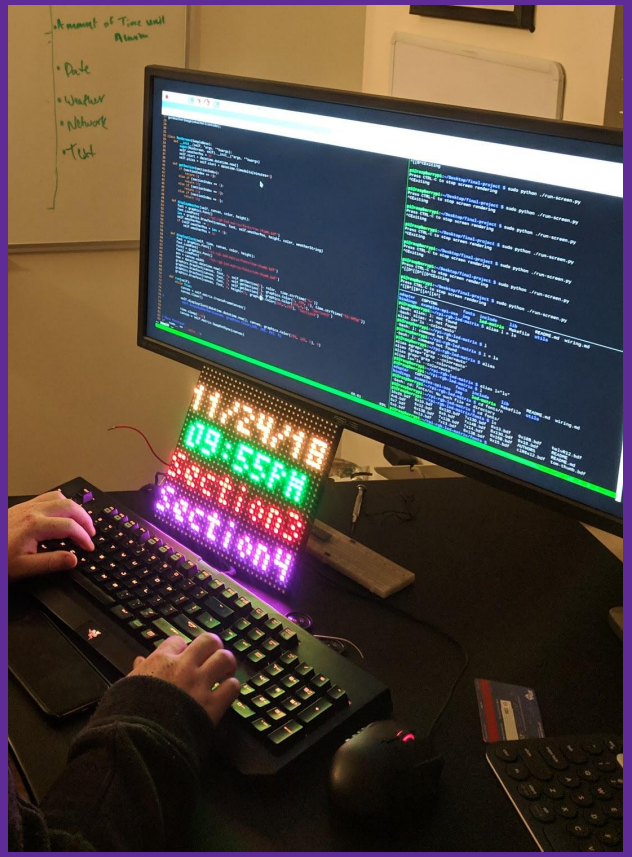
Circuit

Button
32x32 LED Matrix



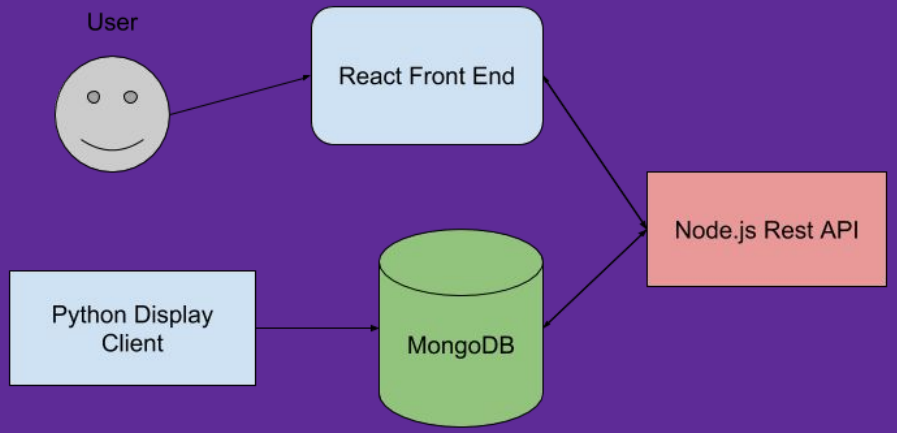
Hardware

- Raspberry Pi
- Matrix pHat
- T-Cobbler



Software

- 3 Services
  - Node.js Rest API
  - React Front End
  - Python Display Client
- MongoDB Datastore



API Endpoints

Path	Allowed HTTP method	Description
`/time`	GET, PATCH	Get / update settings record
`/nextalarm`	GET, PATCH	Get / update settings record
`/date`	GET, PATCH	Get / update settings record
`/weather`	GET, PATCH	Get / update settings record
`/text`	GET, PATCH	Get / update settings record
`/alarms`	GET	Return list of all alarms
`/alarms/:id`	GET, PATCH	Return alarm data of id / update alarm
`/alarms/:id`	DELETE	Delete an alarm by id
`/alarms`	POST	Create an alarm, id is generated
`/modules`	GET, PATCH	Get / update position value of all widgets

Display Client

- rpi-rgb-led-matrix
- PyMongo
- OWM API for weather data
- Pygame plays alarm audio
- RPi.GPIO for GPIO

React Front End

- React, Webpack
- Material UI
- Drag and Drop
- Configure Widgets
- Set Alarms

Problems

- HAT conflicts with GPIO pins
- Running MongoDB on 32 bit Raspbian
  - Docker Image
- Heavy Load
  - Freezes
- Trying to get screen to flash when alarm went off
- Working with time values
- Had to use pygame for playing audio