MVP: Smart Lamp

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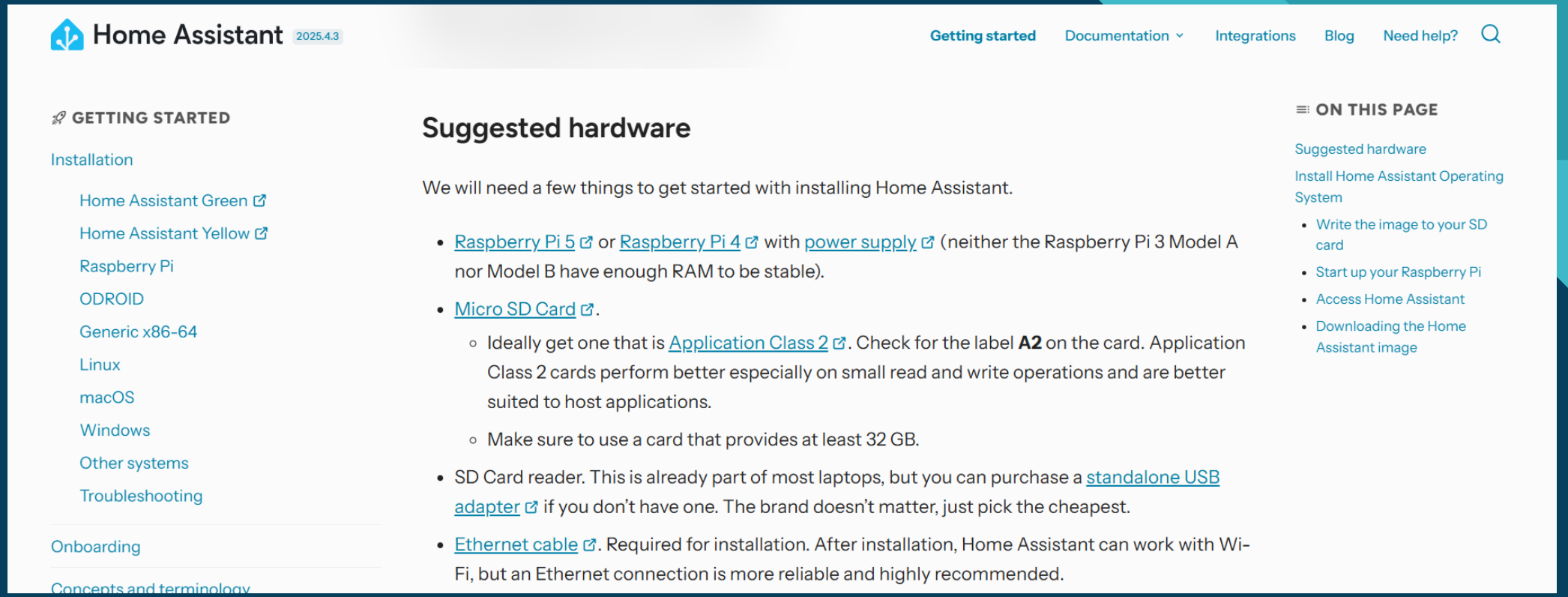
What am I doing?

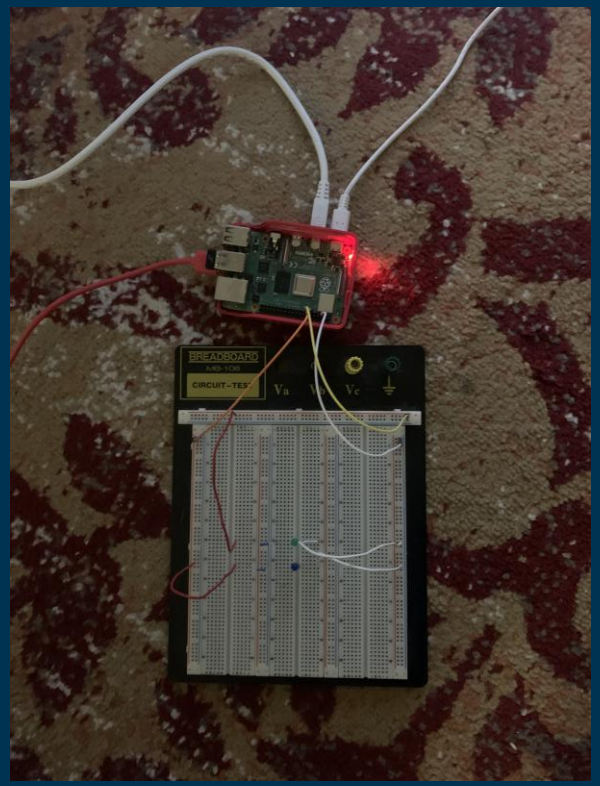
- My goal is to create a smart lamp that helps people with anxiety, sleep disturbances, and trouble focusing
- Incorporating skills from computer science and engineering
- Exploring new areas: coding, hardware, 3D Modeling
- Using lighting to help manage mood

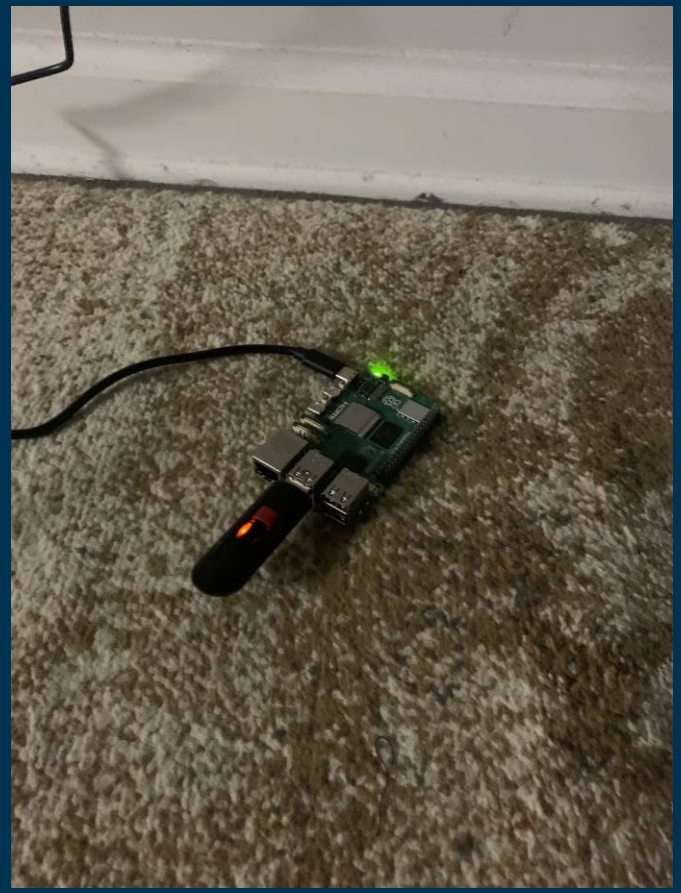
What is Home Assistant

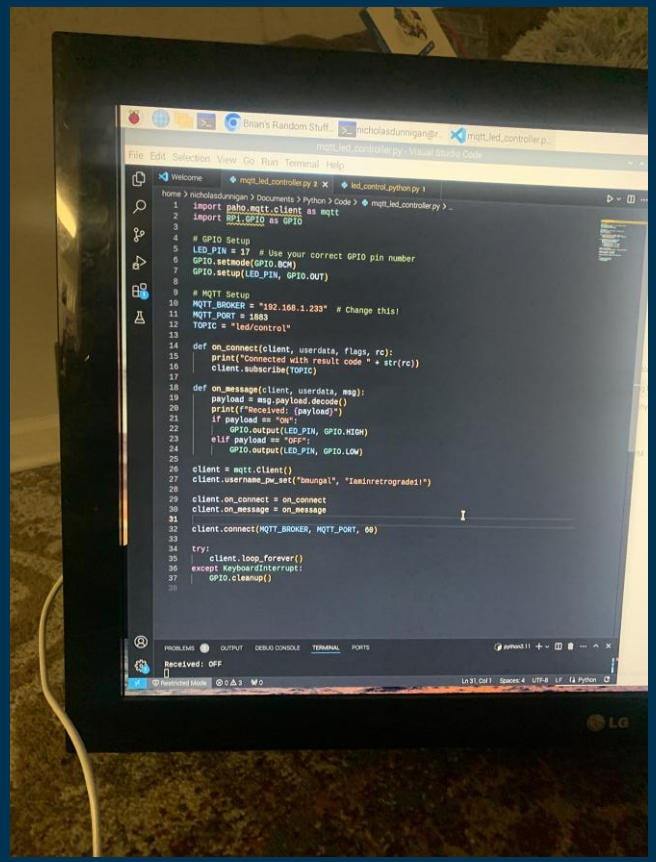
- HA allows users to control smart devices from a single dashboard
- I'm using HA as an API
- HA will connect my two Raspberry Pi's and allow them to communicate between each other
- One Pi is loaded with an image of HA OS that has MQTT or a comm system for machines
- Second Pi executes python code and runs the circuit


Home Assistant 2025.4.3
Getting started
Documentation
Integrations
Blog
Need help?
GETTING STARTED
Installation
Home Assistant Green
Home Assistant Yellow
Raspberry Pi
ODROID
Generic x86-64
Linux
macOS
Windows
Other systems
Troubleshooting
Onboarding
Concepts and terminology
Suggested hardware
We will need a few things to get started with installing Home Assistant.
Raspberry Pi 5 or Raspberry Pi 4 with power supply (neither the Raspberry Pi 3 Model A nor Model B have enough RAM to be stable).
Micro SD Card.
Ideally get one that is Application Class 2. Check for the label A2 on the card. Application Class 2 cards perform better especially on small read and write operations and are better suited to host applications.
Make sure to use a card that provides at least 32 GB.
SD Card reader. This is already part of most laptops, but you can purchase a standalone USB adapter if you don't have one. The brand doesn't matter, just pick the cheapest.
Ethernet cable. Required for installation. After installation, Home Assistant can work with Wi-Fi, but an Ethernet connection is more reliable and highly recommended.
ON THIS PAGE
Suggested hardware
Install Home Assistant Operating System
Write the image to your SD card
Start up your Raspberry Pi
Access Home Assistant
Downloading the Home Assistant image

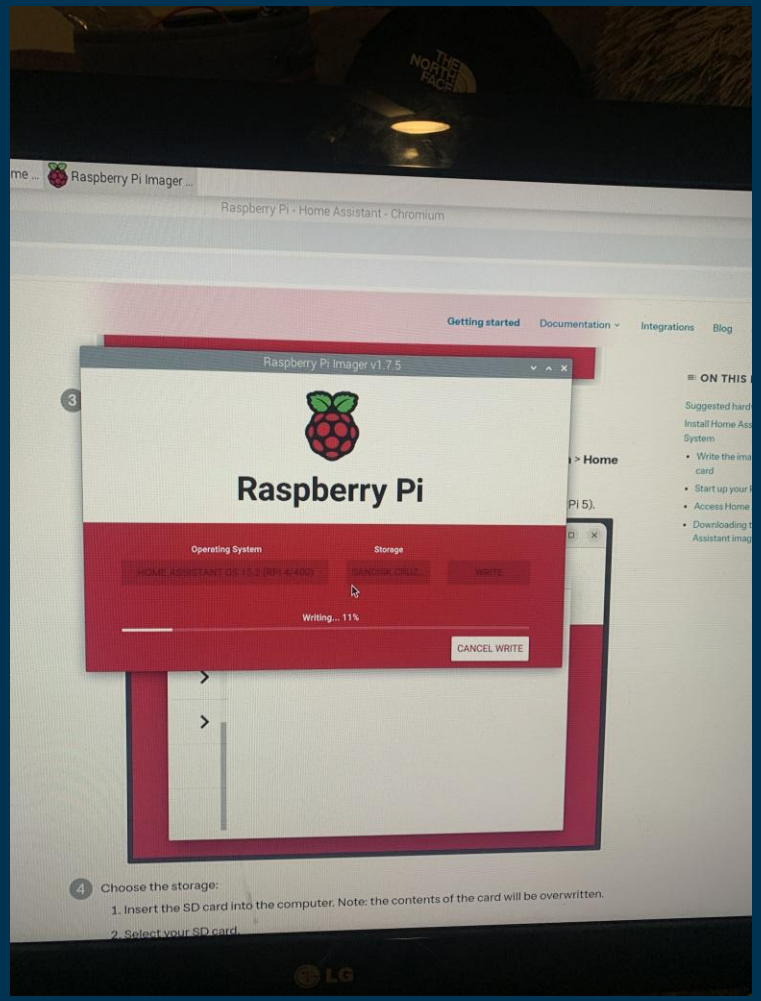
Hardware and code

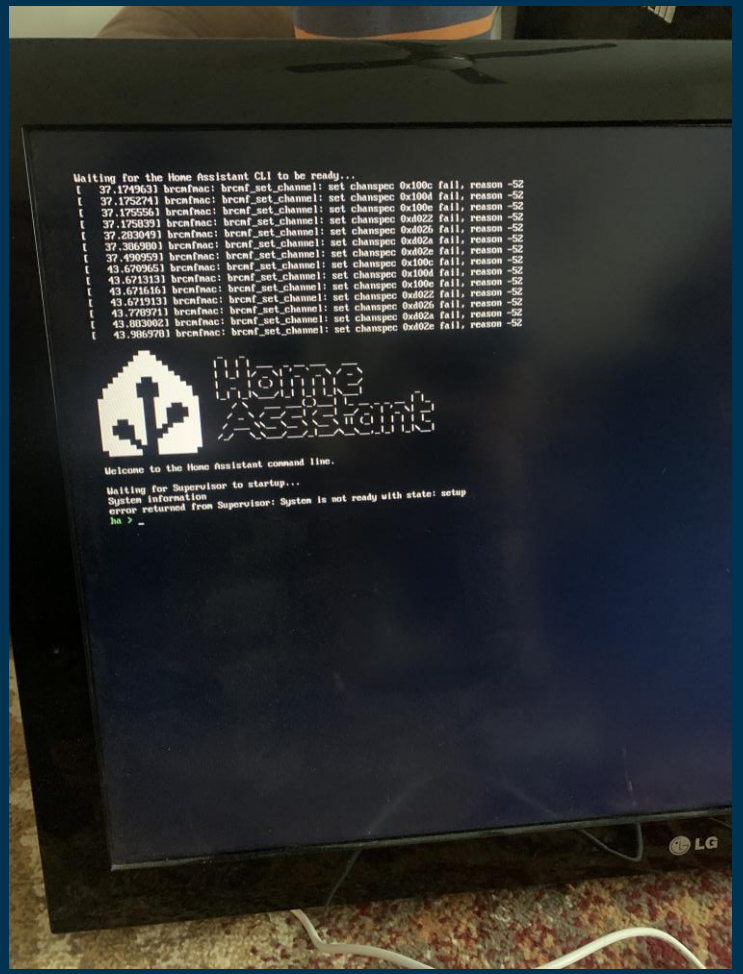


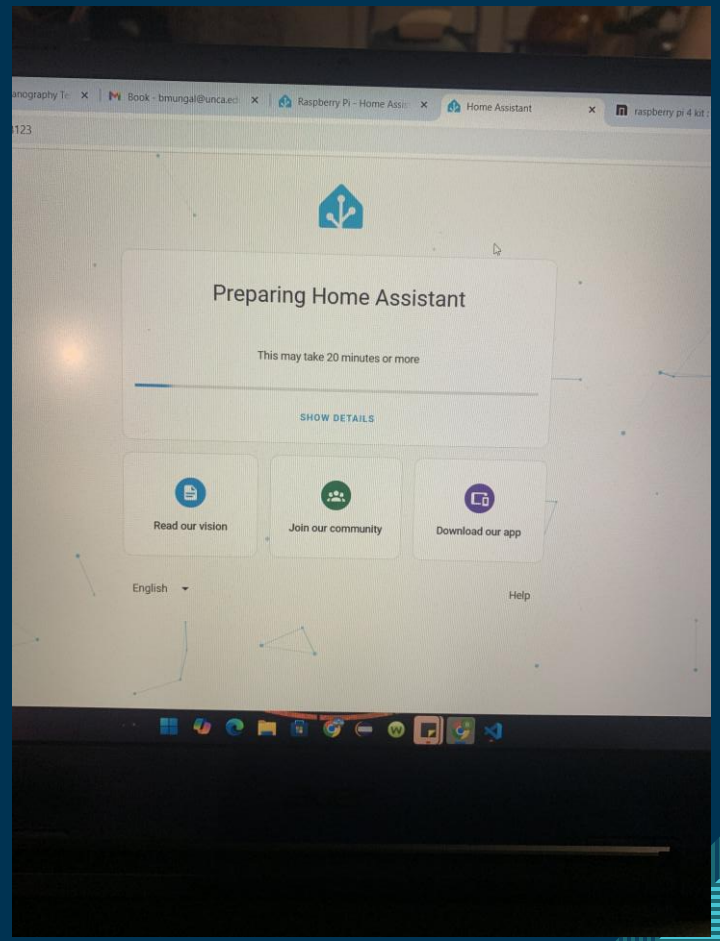




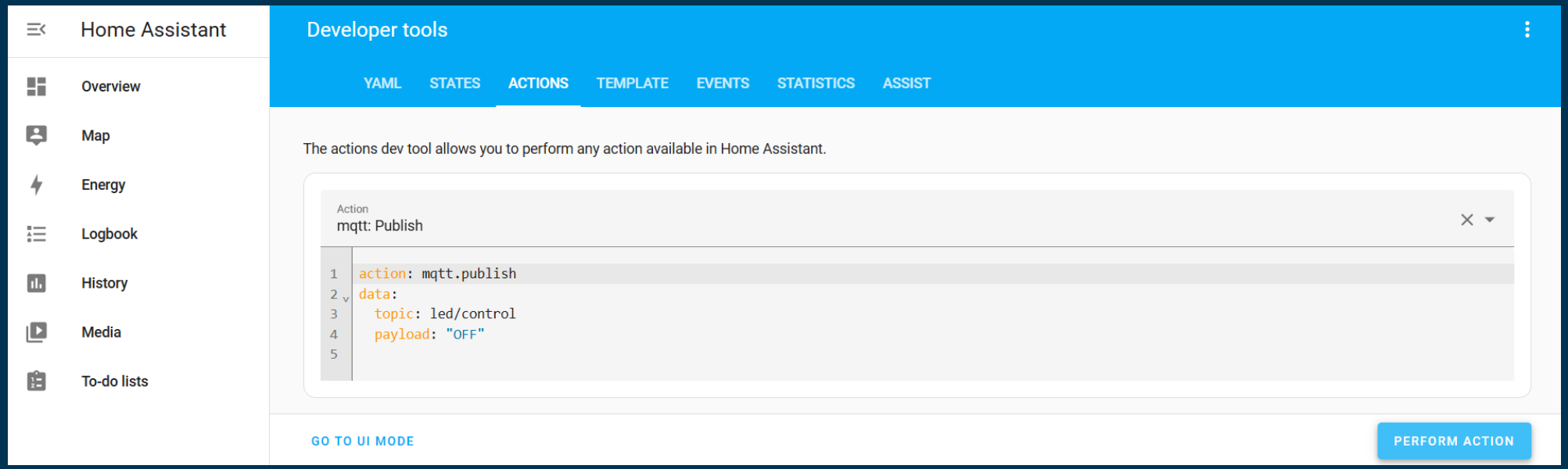
Setting up Home Assistant







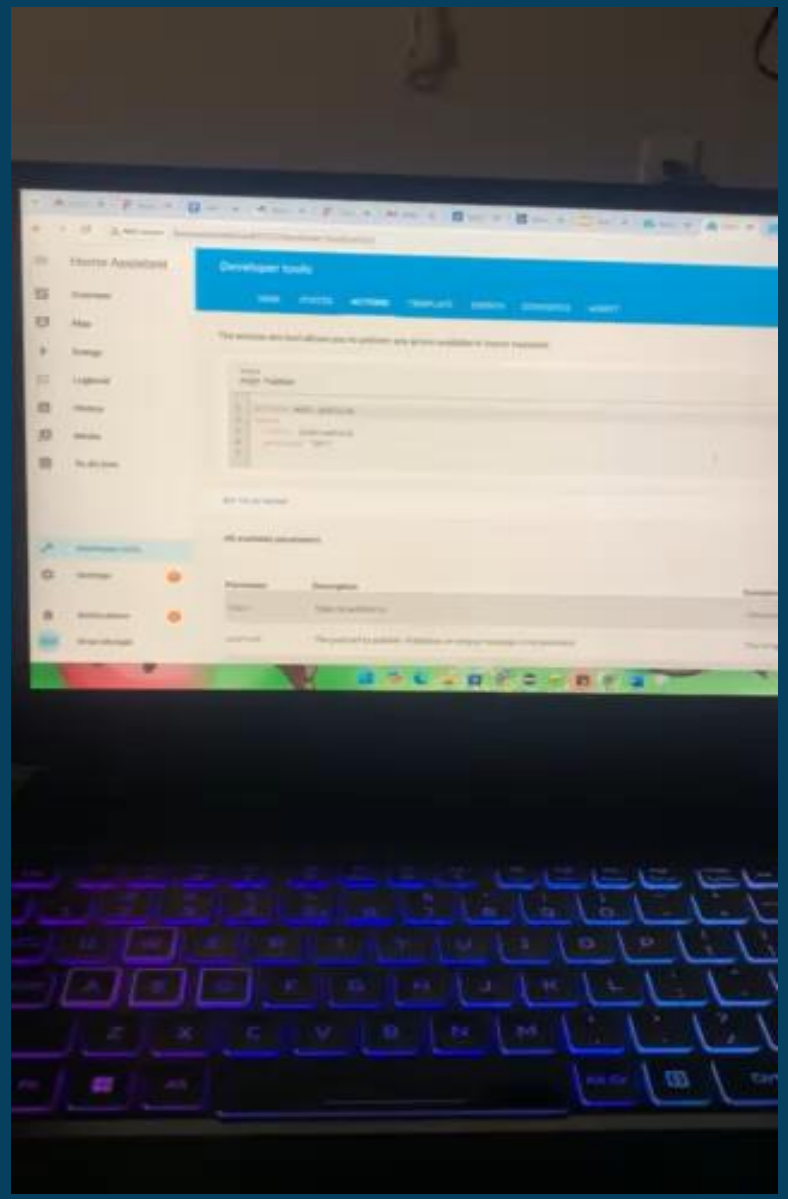
Sending commands



Challenges

- Raspberry Pi: I needed 2, one to hold Image of HA OS and 1 to run commands
- Flashing 2 Raspberry Pi's: Flashing and overriding the OS was time consuming (3-5 hours TWICE)
- Running commands on HA: I couldn't test/ listen to commands that were run on the HA dashboard, I wrote test scripts and ran them live
- HA Comms: finding the correct port number, make sure the device was listening, connecting to the same network, creating a script to login that also had network information

HA in Action



Thank You