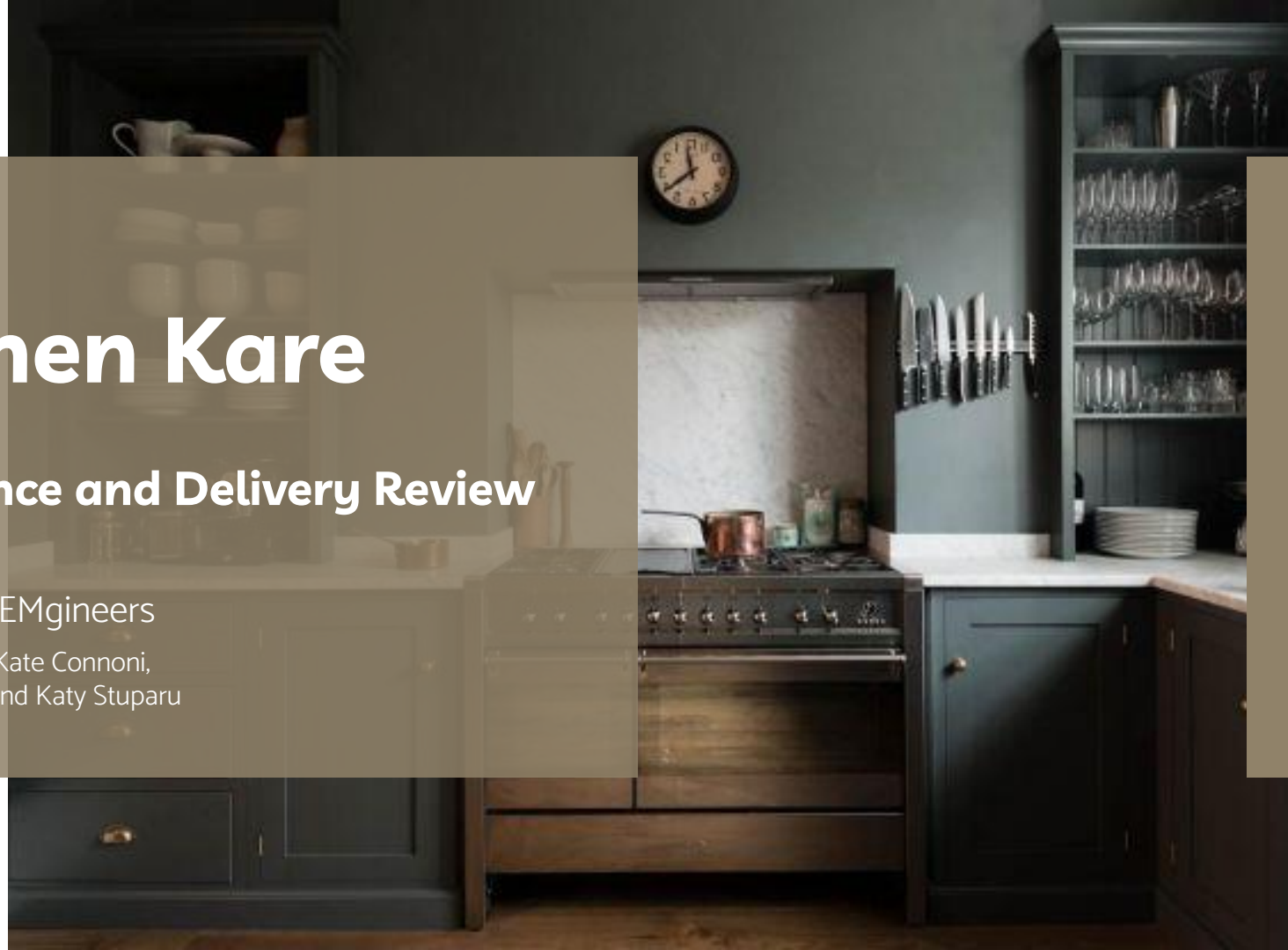


Kitchen Kare

Acceptance and Delivery Review

May 26, 2021

Group 4 - STEMgineers

Ronit Avadhuta, Kate Connoni,
Rachel Haynes, and Katy Stuparu

Kitchen Kare

Ronit Avadhuta, Kate Connoni, Rachel Haynes, Katy Stuparu

Problem Statement:

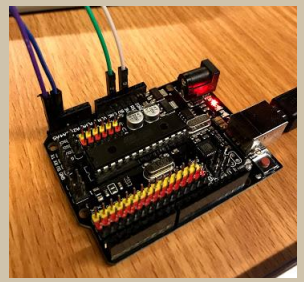
Elderly and disabled individuals may be at greater risk for injuries in the kitchen due to issues with sight, hearing, or memory.

Requirements	Level	Kitchen Kare
detect time stoves been on	1	yes
detect if users been attending stove	1	yes
detect unsafe temperatures of stove	1	yes
turn off stove or oven	1	yes
send signals	1	yes

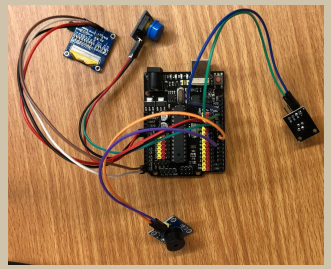
Build:

- Connect sensors (BME280 and SparkFun infrared) to the arduino uno
- Connect alerts (buzzer, light, button and OLED display) to the arduino uno
- Connect all wires using a breadboard

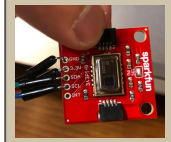
BME Sensor:

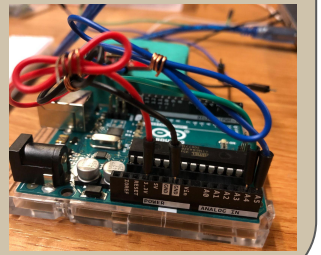


Light, Buzzer, Button, and OLED:

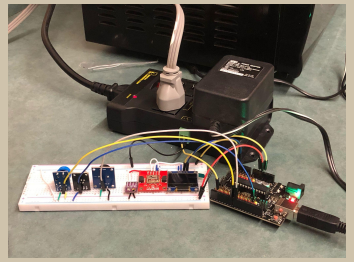


Infrared Sensor:





Final Prototype:



Testing:

- Tested safe oven and stove temperatures with the BME280
- Tested each component of the arduino (light, buzzer, button, OLED, infrared, and BME280) individually
- Tested the entire device after each piece was connected using a breadboard

Conclusion:

The final prototype includes the BME280 sensor, the Sparkfun infrared sensor, the OLED display (to display the temperature), the buzzer, button, light, and 4-outlet wall plug (which will be attached to the stove and hopefully cut the power if the situation is dangerous.)

Extensions:

- Add a wearable component to alert user of dangerous temperature
- Design an app to improve customization
- Allow the device to work without Wifi so the user can leave the house and still get alerts
- Create a manual to help the user better understand the device

TABLE OF CONTENTS

Problem Statement

Elderly and disabled individuals may be at greater risk for injuries in the kitchen due to issues with sight, hearing, or memory.

Motivation

Fire is the third leading cause of death for the elderly

Requirements

Level 1	Level 2	Level 3
detect time stoves been on	easy set up	takes up a half square foot or less
detect if users presses button	$50 or less	manual
detect unsafe temp of stove	easy to use	looks nice
turn off stove or oven	compact	mobile app
send signals to user	less than 20 g (without wall plug)	
detect user presence via infrared	customizable	

PDR Designs

Kitchen Kare Motion

- motion sensor
- send message
- wearable component
- beeps and flashes
- easy to use

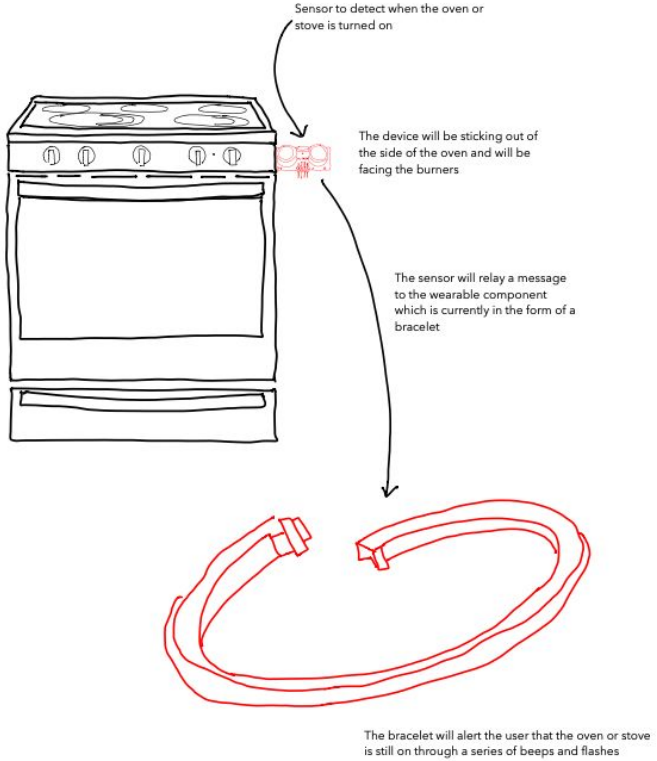
Kitchen Kare Heat

- heat sensor
- relay message
- wearable component
- beeps and flashes
- easy to use

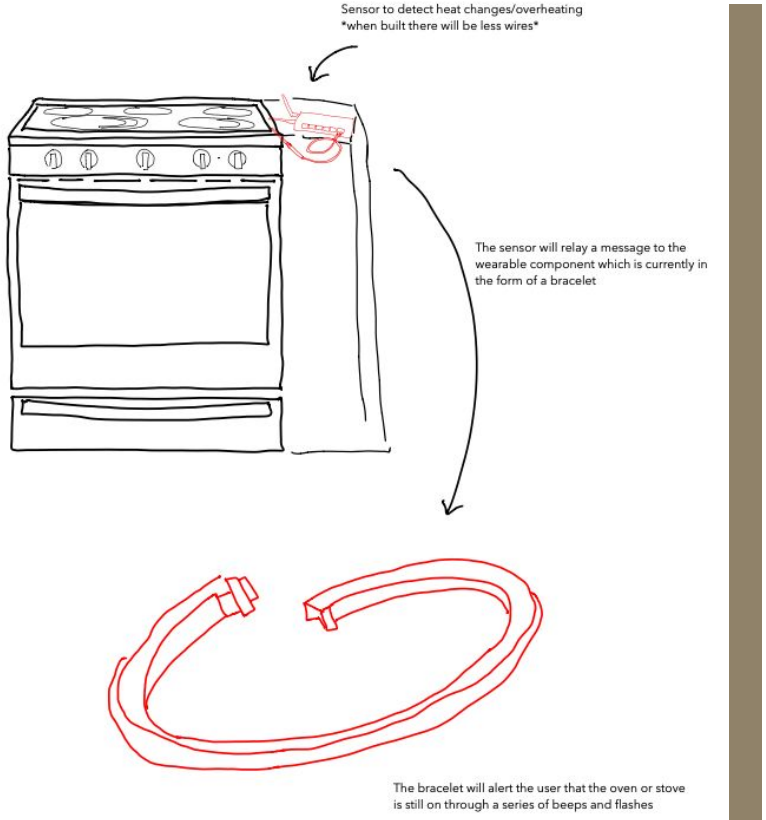
Kitchen Kare App

- sends notifications
- customizable
- beeps
- relay message

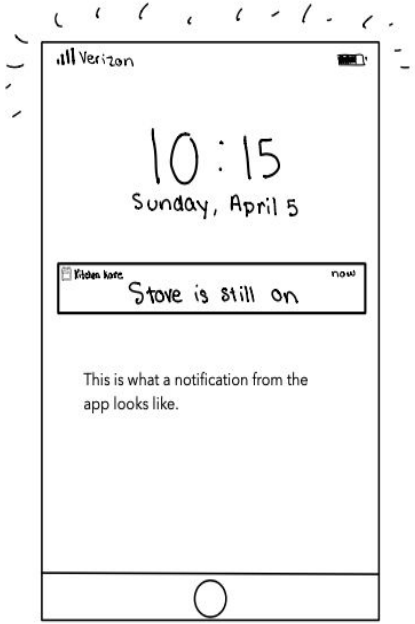
PDR Designs



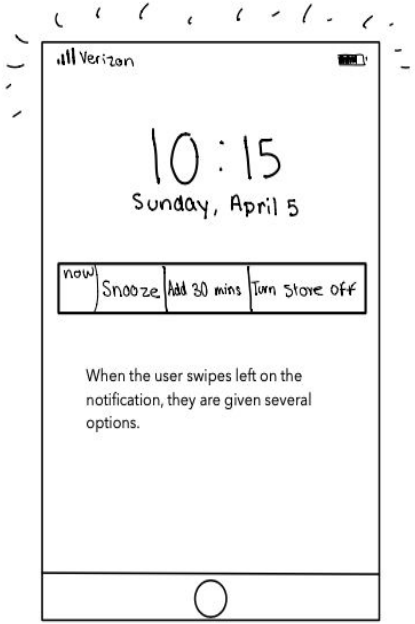
Kitchen Kare Motion



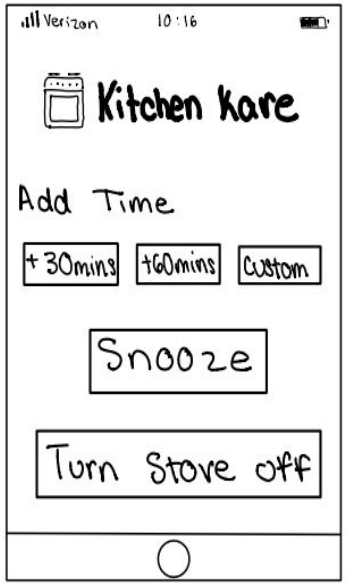
Kitchen Kare Heat



This is what a notification from the app looks like.



When the user swipes left on the notification, they are given several options.



The app homepage will display a snooze button to silence the alarm and a turn stove off button to turn the stove off from a distance.
The app will also allow the user to add time so that the alert goes off later.

PDR Designs

Kitchen Kare App

CDR Designs

Kitchen Kare Motion

- motion sensor
- send message
- beeps and flashes
- easy to use

Kitchen Kare Heat

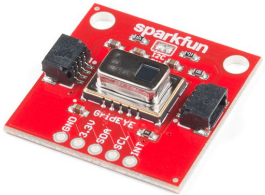
- heat sensor
- relay message
- beeps and flashes
- easy to use

Kitchen Kare Motion + Heat

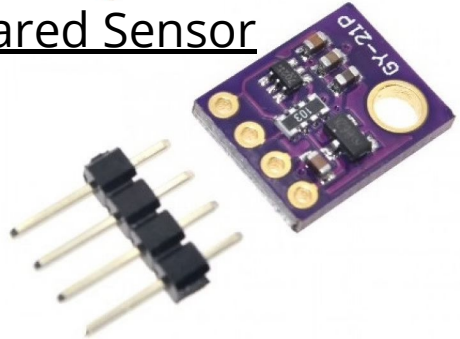
- motion sensor
- heat sensor
- send message
- beeps and flashes
- easy to use
- turns oven off

CDR Design

- Alert user that oven is still on by sending visual and audio signals



Infrared Sensor



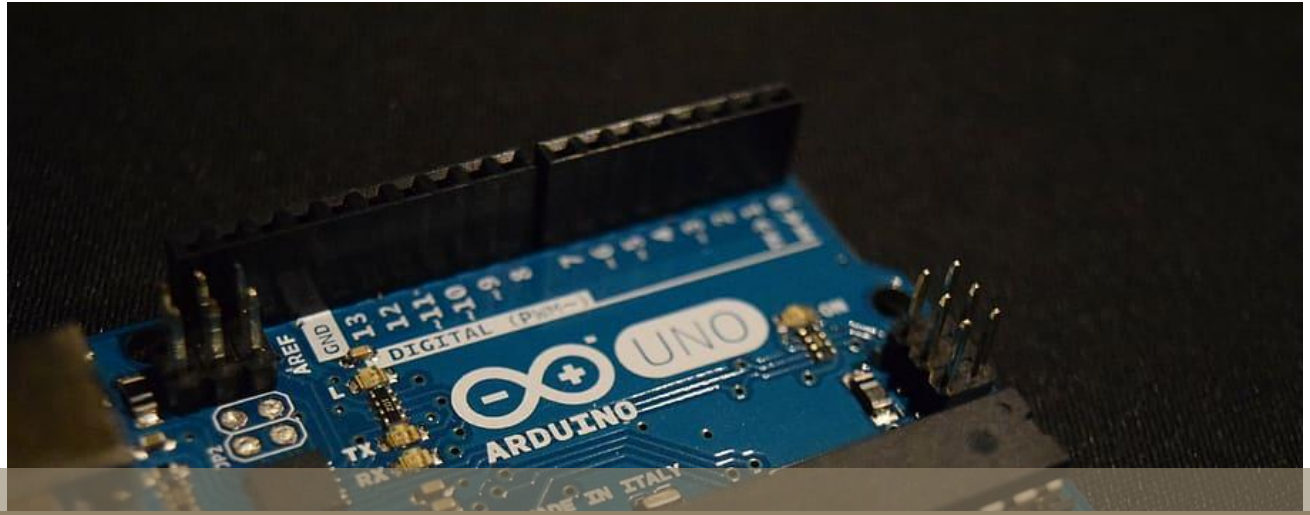
BME280

Wall Plug

LED Lights

Speaker

Build Process



Step 1

Gather materials

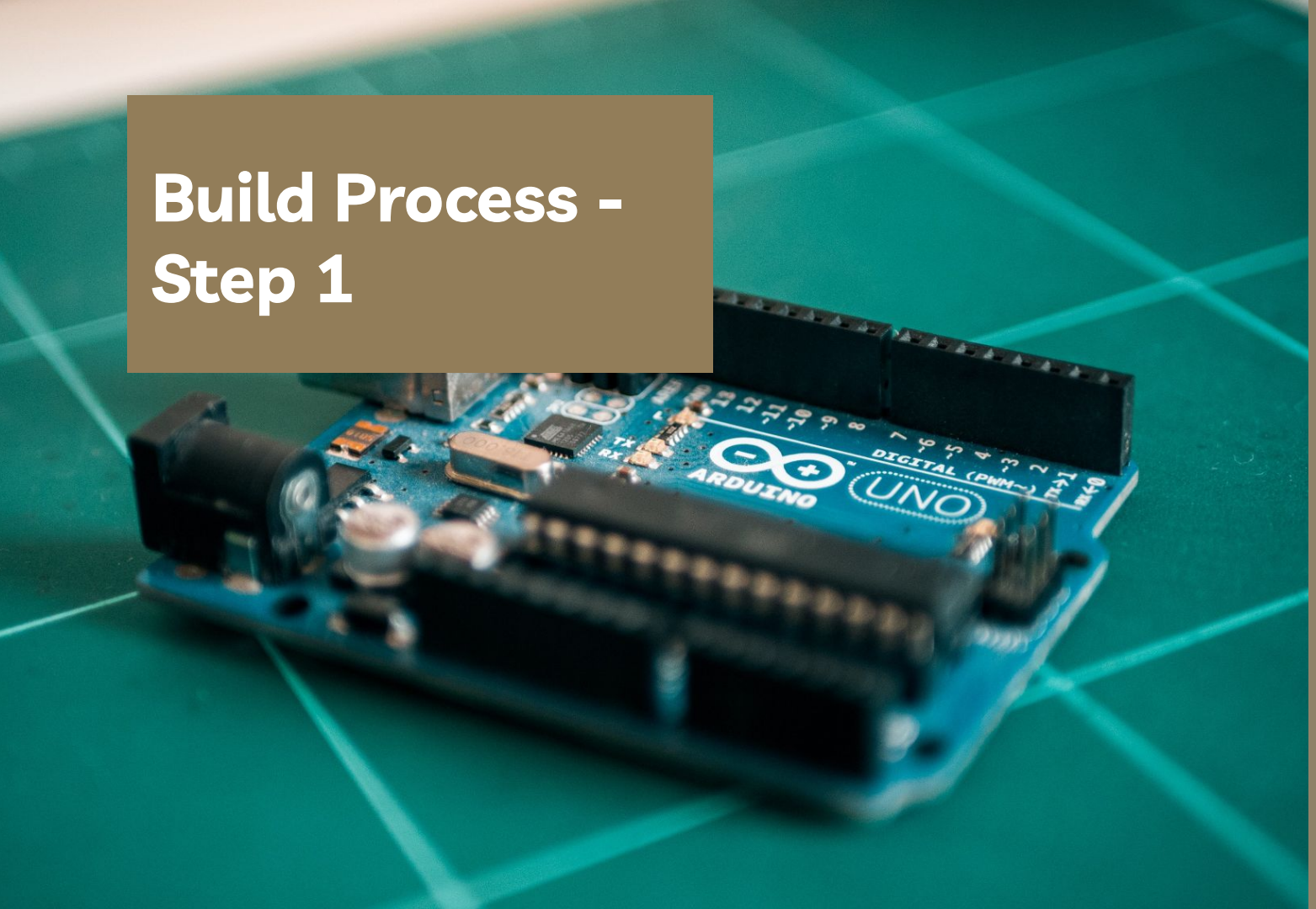
Step 2

Create device

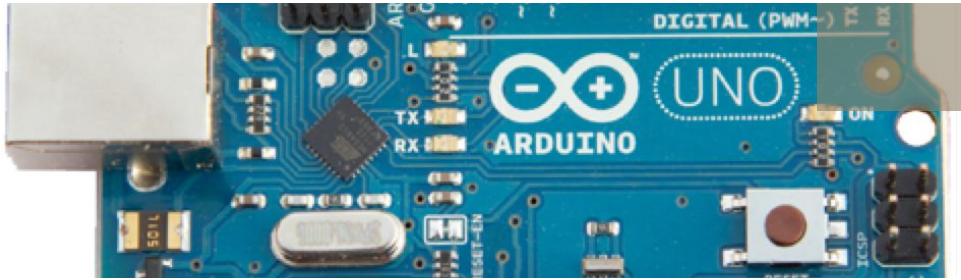
Step 3

Test

Build Process - Step 1



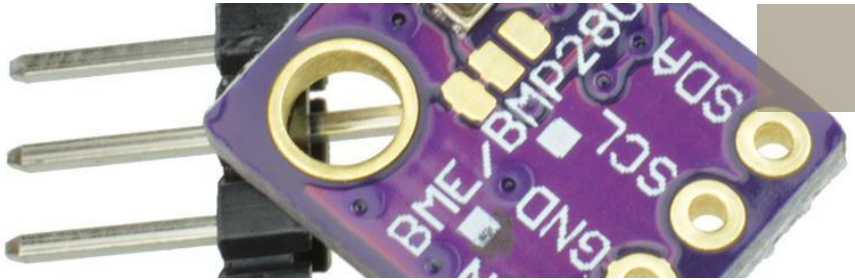
Materials



Arduino Uno

Infrared Sensor

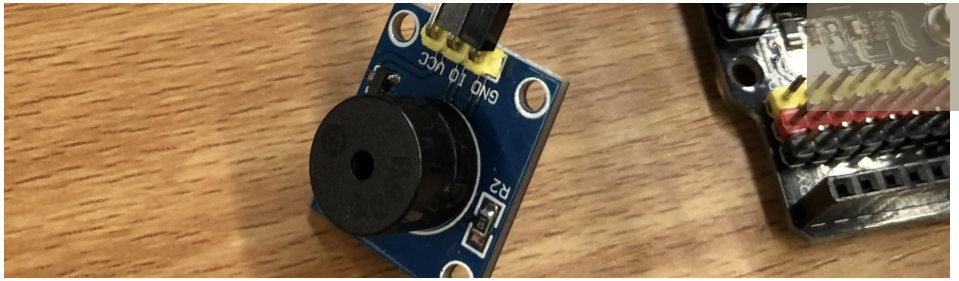
Senses if there is a person in the kitchen



BME280

Measures the temperature

Materials



Beeper and light

Sends a visual and auditory alert to the user that the temperature is above a safe level

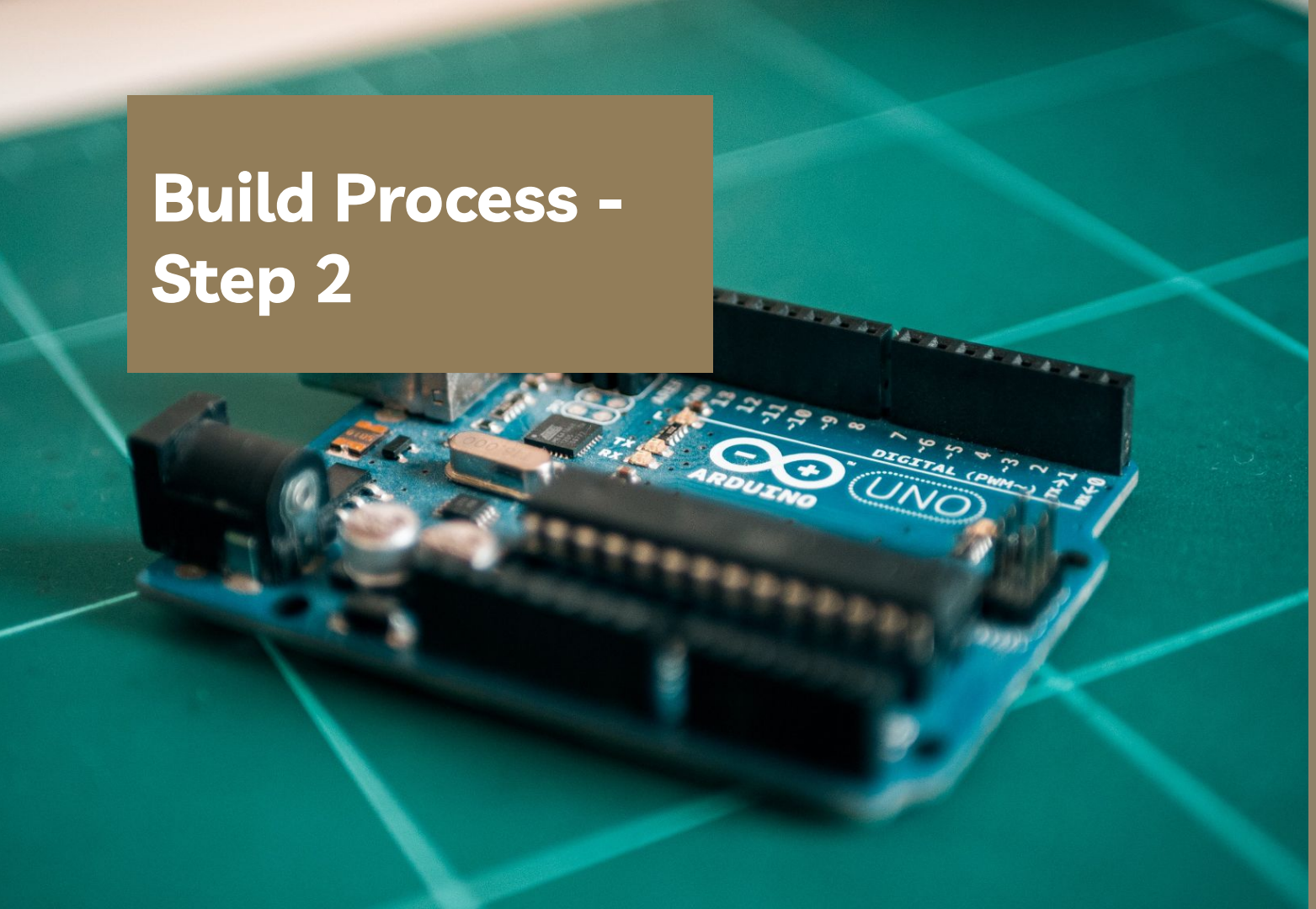
OLED Sensor

Displays the temperature of the stove/over found by the BME 280

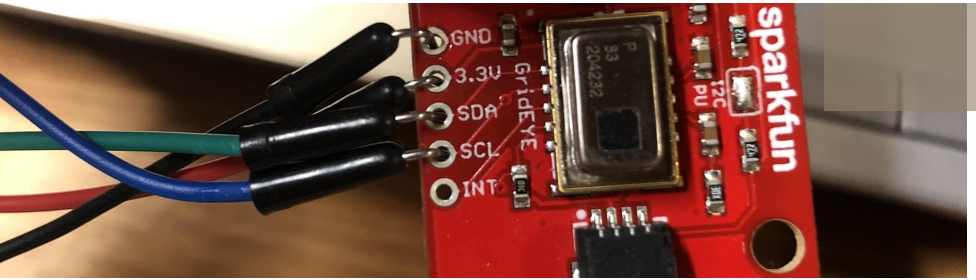
Wall Plug

The stove/over will be plugged into the wall plug and it will cut the power to said appliance if the temperature becomes dangerous

Build Process - Step 2



Create Device

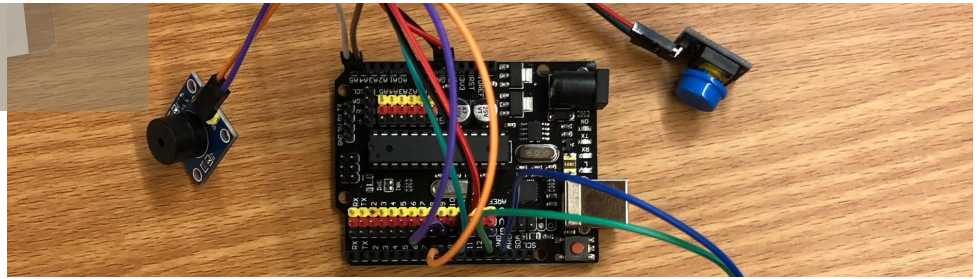


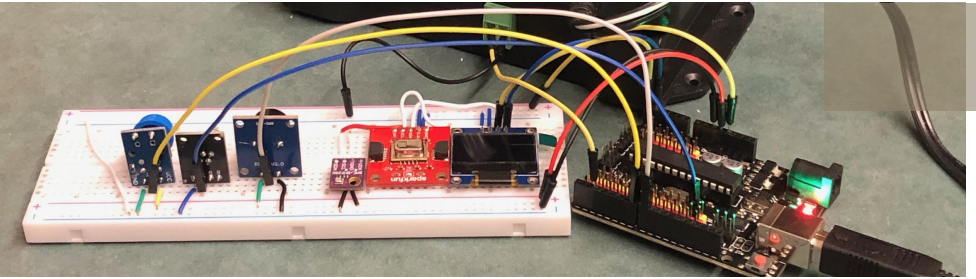
Sensors

Connect BME280 and the infrared sensor to arduino uno

Alerts

Connect beeper, light, button, and OLED sensor to the arduino uno

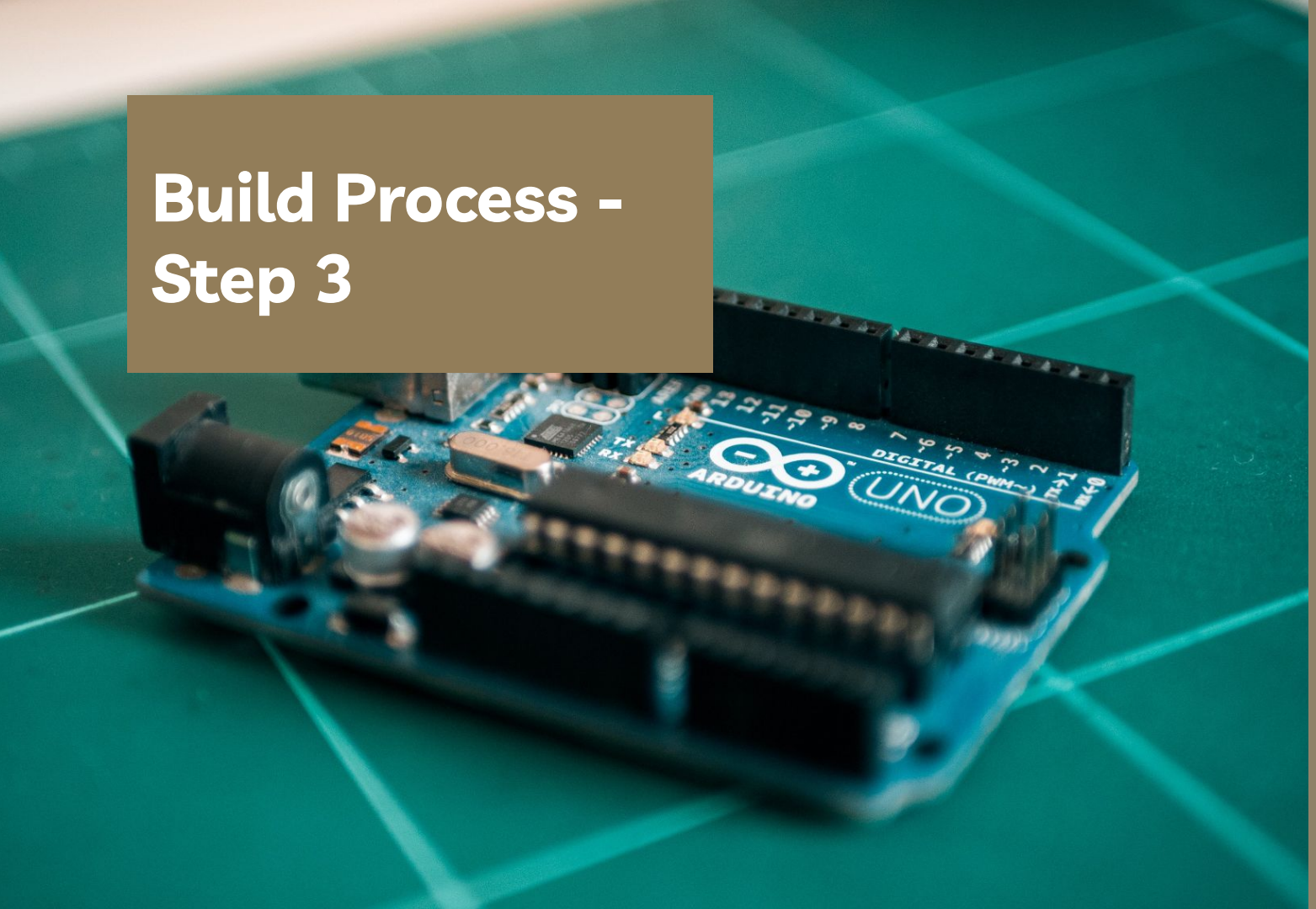




Breadboard

Connect all the wires to the breadboard

Build Process - Step 3



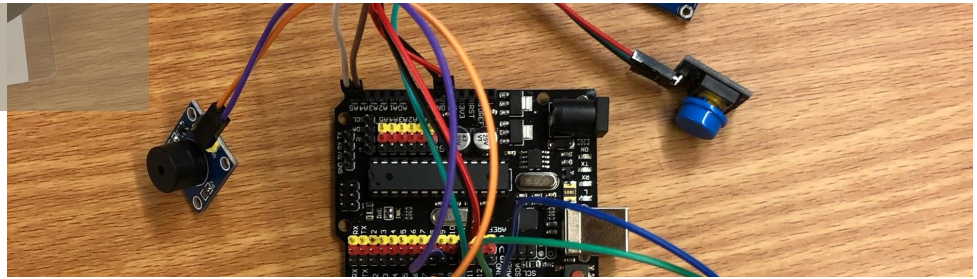
Testing

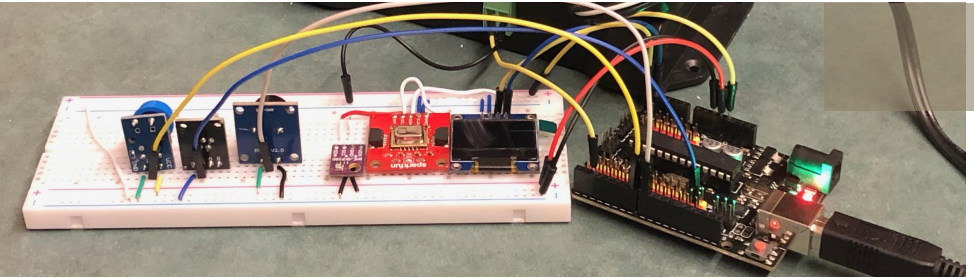
Initial Testing

Test oven and stove temperatures using BME280

Each Component

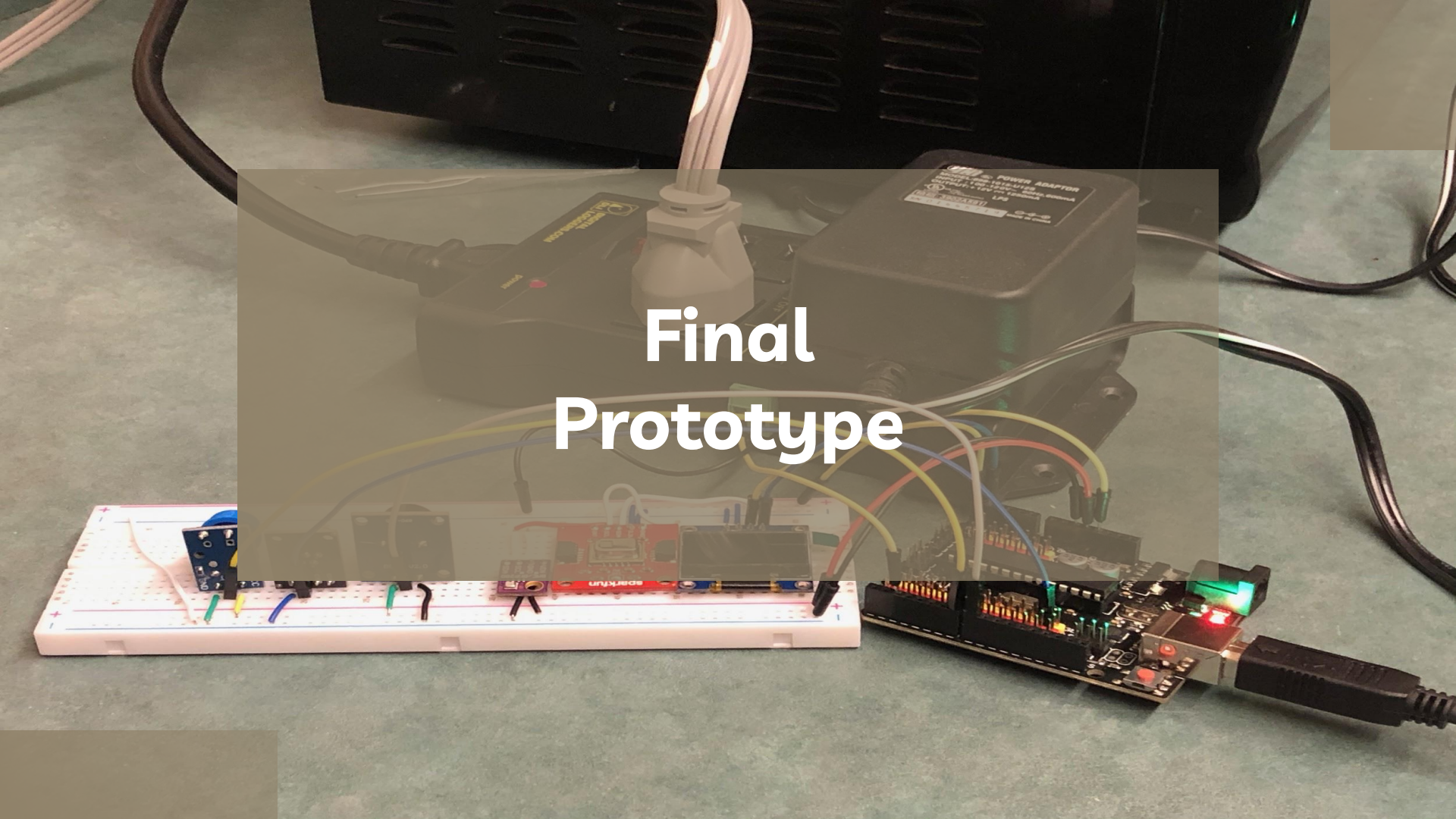
Test each component of the arduino





Final Product

Test the entire device

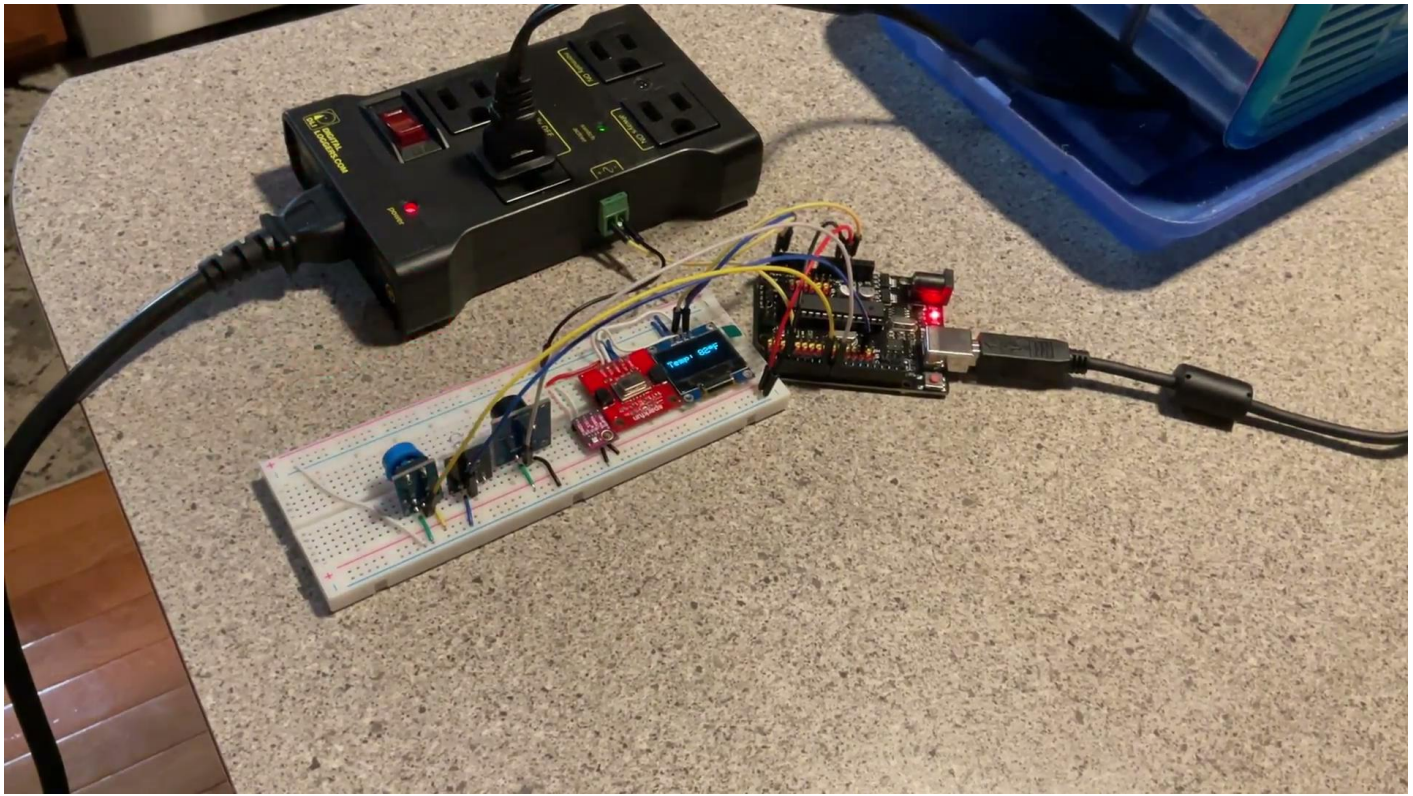


Final Prototype

Requirements

Level 1	Level 2	Level 3
detect time stoves been on ✓	easy set up ✓	takes up a half square foot or less ✓
detect if users presses button ✓	$50 or less ✗	manual ✓
detect unsafe temp of stove ✓	easy to use ✓	looks nice ✗
turn off stove or oven ✓	compact	mobile app ✗
send signals to user ✓	less than 20 g (without wall plug) ✓	
detect user presence via infrared ✓	customizable ✗	

Video Demonstration



Extensions

Wearable Component

Allows user to receive alerts while away from kitchen

App

Improves customization

Wifi

Allows user mobility while still receiving notifications

Proper Plug

Allows the device to work with most conventional ovens (plug type, can handle current)

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THANKS

Does anyone have any questions?