Preventing the Trip of My Circuit Breaker: Controlling Room Temperature while Brewing Tea

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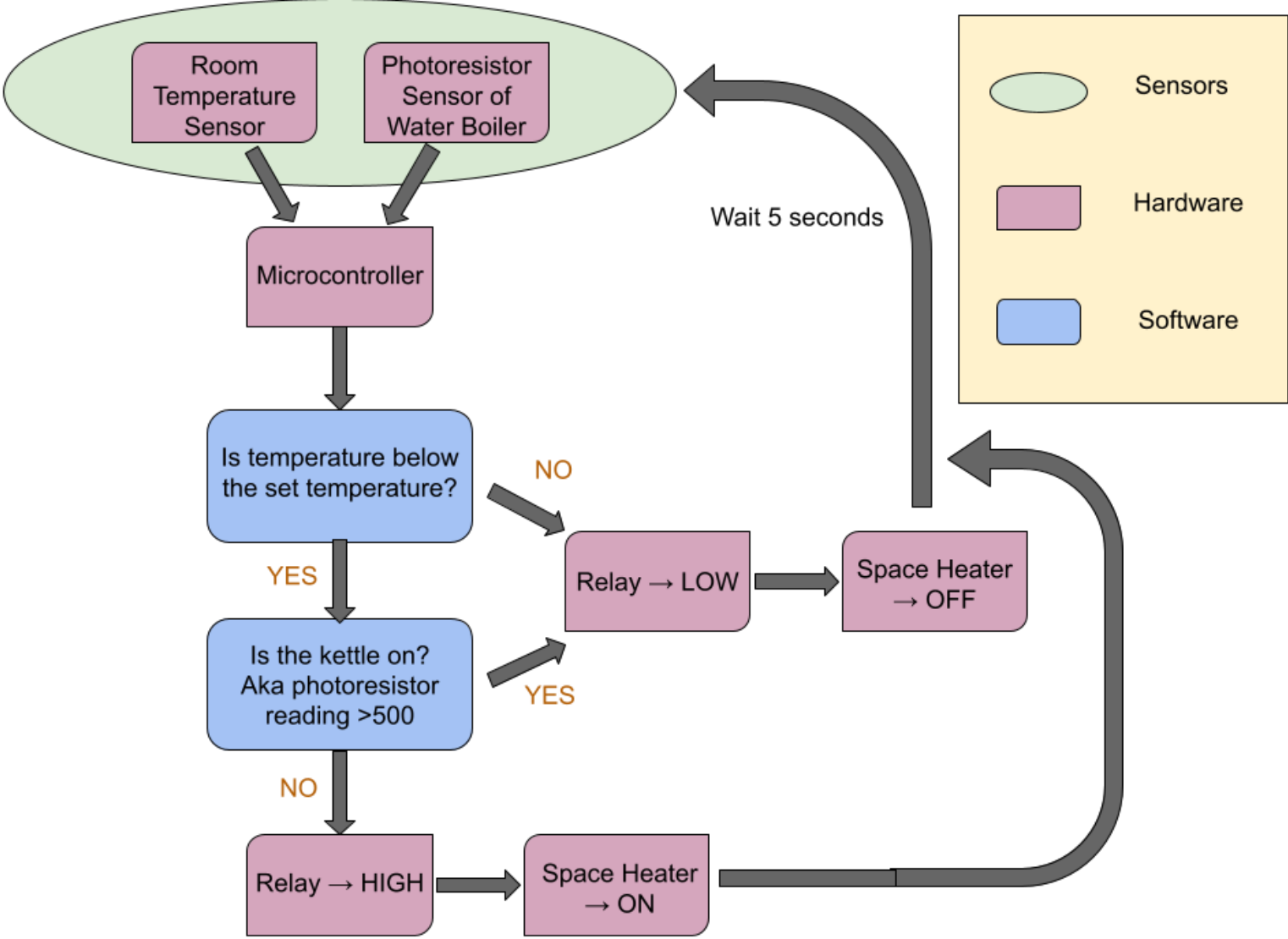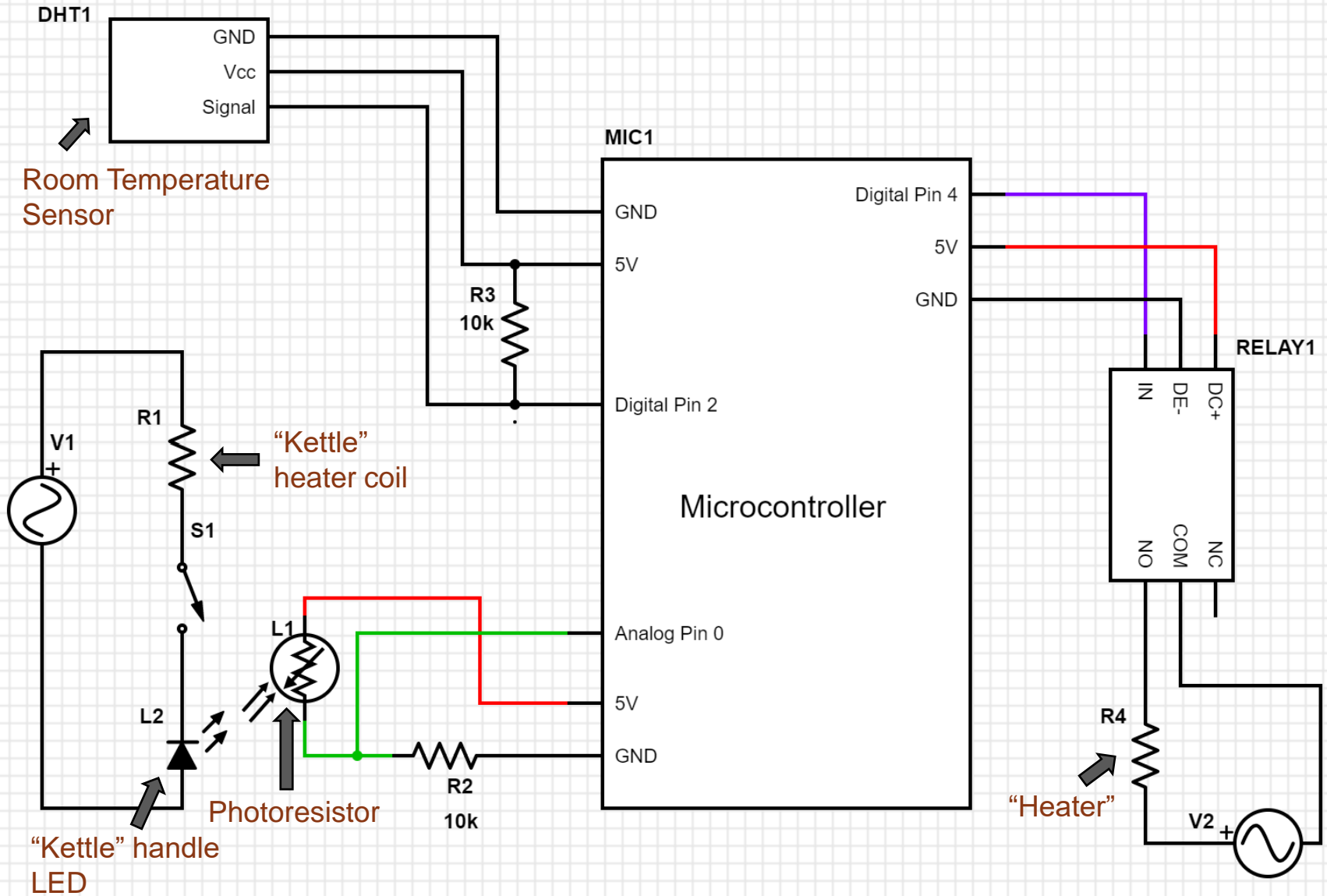**Physical Electronics Lab**

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Basic Idea

- Problem 1: Circuit breaker trips

- Problem 2: Constantly adjusting heater

- Solution:
    - Measure ambient temperature
    - Detect whether kettle is operating
    - Use Microcontroller and relay to turn the heater on/off
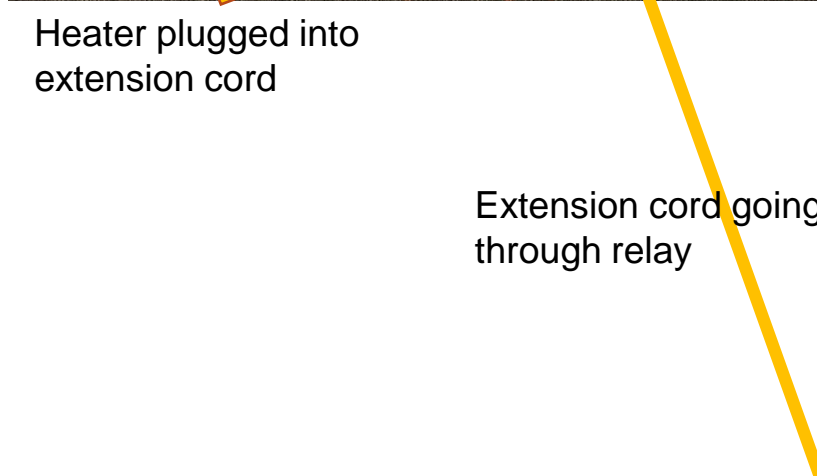
Flowchart

Electronic Schematic
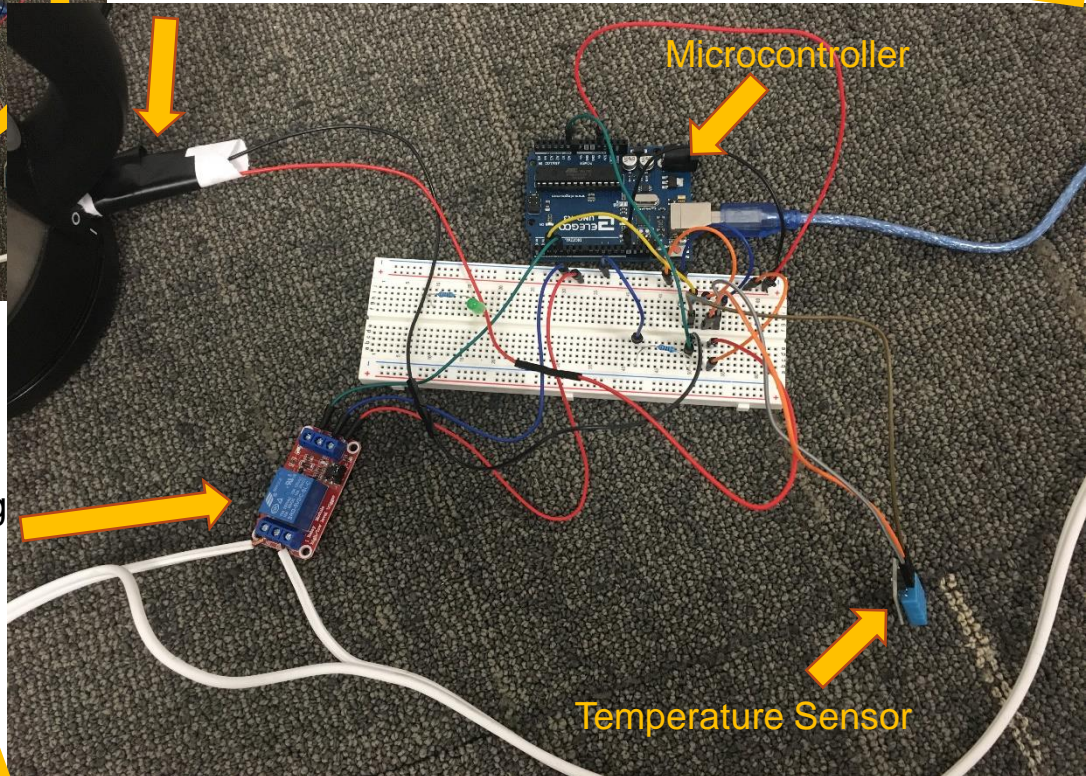
Putting it Together

Kettle plugged into outlet

Photoresistor attached to kettle light

Microcontroller

Heater plugged into extension cord
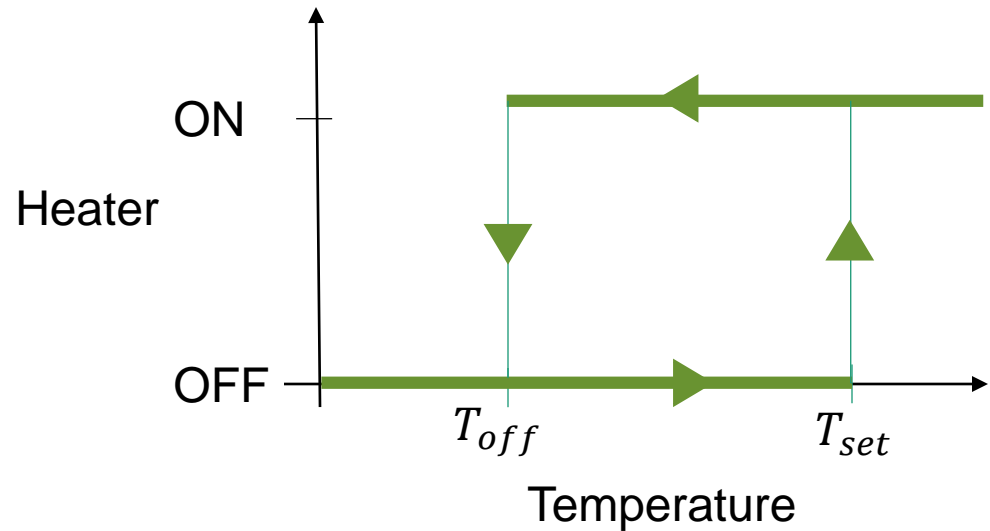
Extension cord going through relay

Temperature Sensor

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Thank you!

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Hysteresis (Schmitt Trigger)

- Implemented in the code

- Keeps device from continuously turning on/off

Heater

ON

OFF

T_{off}　　　　T_{set}

Temperature

Electronic Schematic

Microcontroller

60.0 Hz
10.0 V
0.00 V

Photoresistor

"Kettle" handle
LED

"Kettle"
heater coil

60.0 Hz
10.0 V
0.00 V

"Heater"

Relay

Room Temperature
Sensor