Smart Plant Monitor
Proof-of-Concept Prototype

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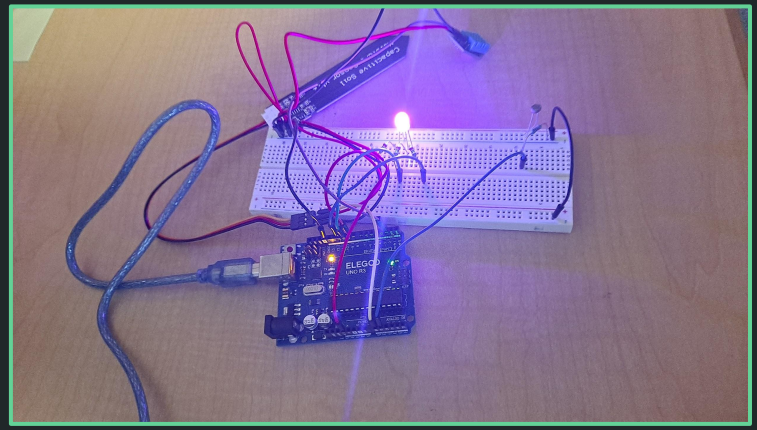


The Smart Plant Monitor

What our project is supposed to do when complete

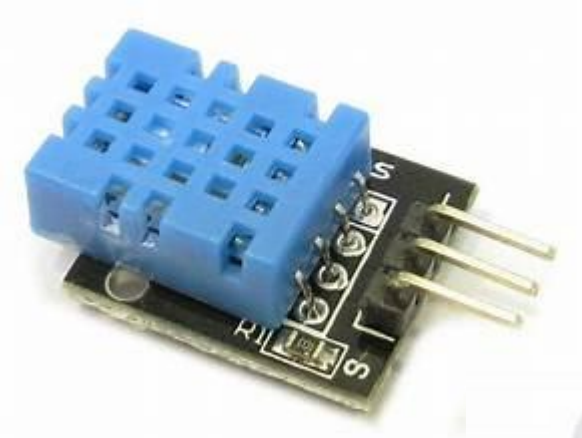
- The Smart Plant Monitor will be a simple, portable device that aims to monitor temperature, soil moisture and sunlight levels to keep plants healthy.
- The sensors will collect environmental data and give the user continuous feedback through the use of an RGB LED.
- The use of the project will make it easier to take care of plants.

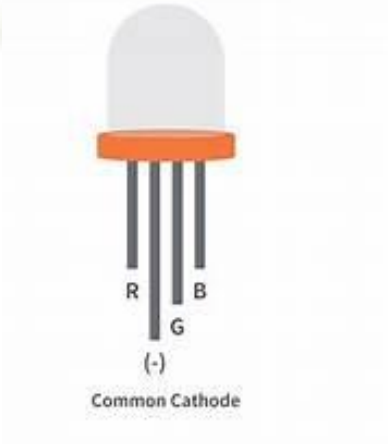
The Smart Plant Monitor

Proof-of-Concept Prototype:

- Our project is able to measure and read the current temperature, soil moisture level and light level.
- Working Components:
  - Soil Moisture Sensor
  - Photoresistor
  - DHT11 Temperature Sensor
  - RGB LED
  - Serial Input (to set optimal ranges)

The Smart Plant Monitor





The Smart Plant Monitor

How it works:

- User is prompted to enter the optimal ranges for temperature and the minimum level for the soil moisture and light level
- *Note: These are entered through the serial monitor since the input device isn't set up yet*

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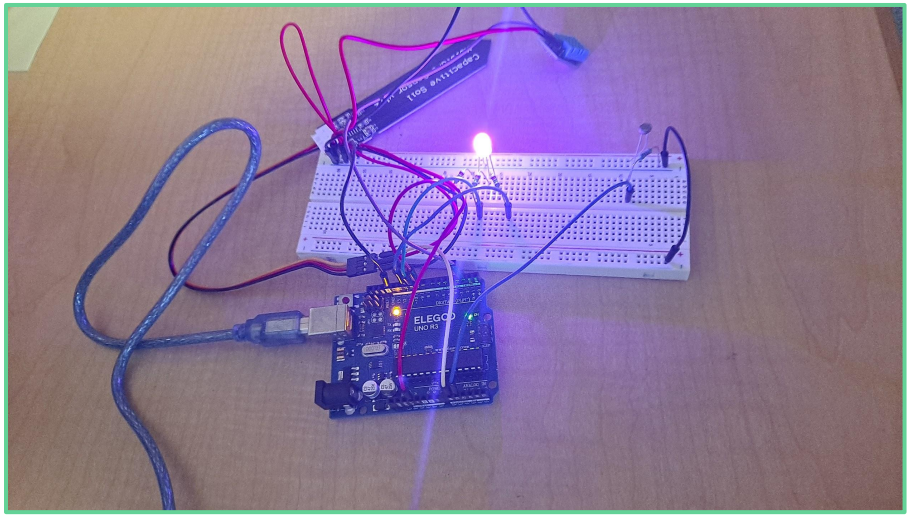
Smart Plant Monitor with RGB LED Alerts (°F)
Enter the minimum (LOWER) soil moisture level (0-100):
Enter the LOWER optimal temperature (°F, 0-100):
Enter the UPPER optimal temperature (°F, 0-100):
Enter the minimum optimal light level (0-1023):
```

The Smart Plant Monitor

How it works:

- Sensors measures and reads the temperature, soil moisture and light level every 10 seconds.
    - *Note: 10 seconds can be changed to any duration of time*
- Based on the user's optimal ranges that were entered, the system determines whether or not if the current measurements fit into the ranges



The Smart Plant Monitor

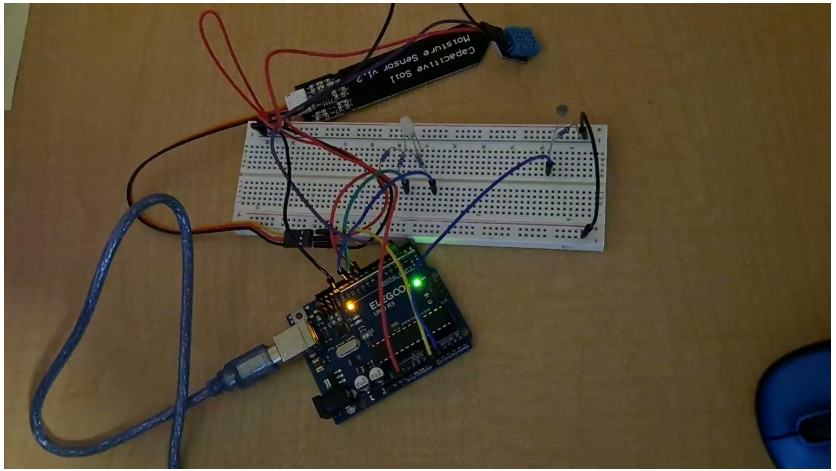
How it works:

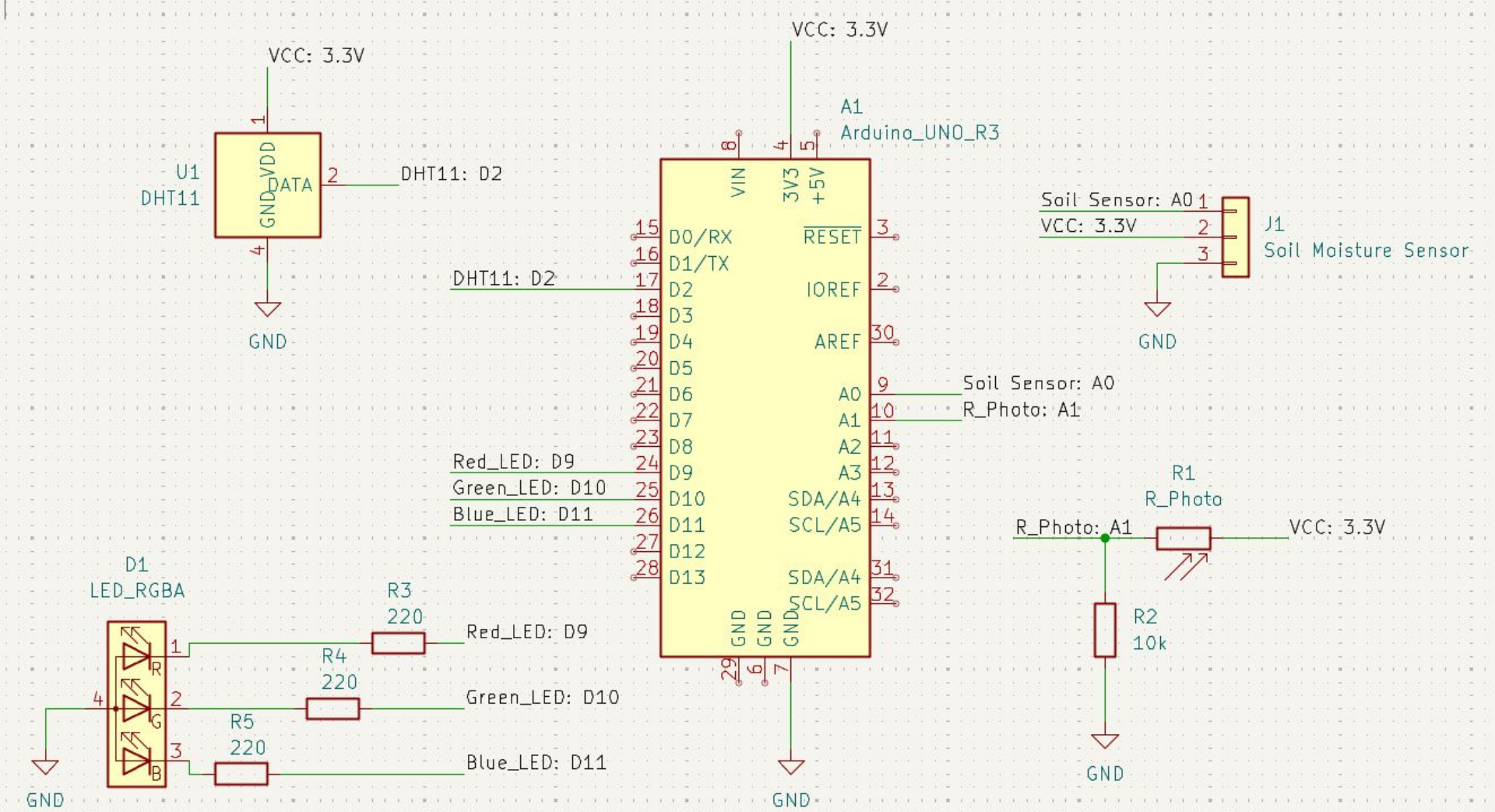
Everything is in Optimal Range	RGB LED is off
Current Temperature is too hot	RGB LED turns red
Current Temperature is too cold	RGB LED turns blue
Current Soil Moisture is too dry	RGB LED turns yellow
Current Light Level is too dark	RGB LED turns purple

The Smart Plant Monitor

How it works:

- If there is more than one measurement that is out of the optimal range, the RGB LED will instead blink in sequence.
  - For example if the current temperature is too cold, the soil is too dry and it is too dark, the RGB LED will blink Blue, Yellow, Purple




VCC: 3.3V
U1
DHT11
VDD
DATA
GND
1
2
4
DHT11: D2
GND
VCC: 3.3V
A1
Arduino_UNO_R3
VIN
3V3
+5V
8
4
5
15
16
17
18
19
20
21
22
23
24
25
26
27
28
D0/RX
D1/TX
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D13
DHT11: D2
Red_LED: D9
Green_LED: D10
Blue_LED: D11
RESET
IOREF
AREF
A0
A1
A2
A3
SDA/A4
SCL/A5
SDA/A4
SCL/A5
3
2
30
9
10
11
12
13
14
31
32
Soil Sensor: A0
R_Photo: A1
GND
GND
GND
29
6
7
Soil Sensor: A0
VCC: 3.3V
1
2
3
J1
Soil Moisture Sensor
GND
R1
R_Photo
R_Photo: A1
VCC: 3.3V
R2
10k
GND
D1
LED_RGBA
R
G
B
1
2
3
4
R3
220
R4
220
R5
220
Red_LED: D9
Green_LED: D10
Blue_LED: D11
GND

The Smart Plant Monitor

What still needs to be worked on:

- User Input Component
  - Remote Control/IR Receiver
  - Originally wanted to use rotary encoder
- Clock for Photoresistor
  - To prevent the photoresistor from detecting low light during nighttime, a clock feature can be added to the code. This would allow the user to define specific night hours, ensuring the photoresistor is inactive during that period.
- Resistor Values
  - To balance the brightness of the different colors in the RGB LED, each color should have a specific resistor value
- Display
  - LCD1602
  - Can be used to help guide the user when entering the optimal ranges
- Reset Button
  - Used to reset the optimal ranges entered at the beginning

Live Demo of the Proof-of-Concept Prototype

Any Questions??