Project Name: TBD

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Project Motivation and Overview:

As myself and many around me have developed an interest in gardening, I have found that it can be tough to keep up with everything required to grow healthy plants and produce. It's not quite as simple as Water + Sun = Plant. I thought it would be good to have a device that collects and tracks as many data points as possible from the garden or greenhouse and publish the data locally and to the cloud to be viewed and parsed.

Minimum Features:

- Local environmental and soil conditions
- PH sensor (manual deployment)
- Light levels
- Publish data to Node Red (WiFi for prototype, LoRa or BLE to another device for implementation)
- Solar/battery power

Desired Features:

- Automated reminders (water, fertilize, etc)
- Some sort of control from Node Red dashboard
- Keypad input to change reminder schedule, input optional data (manually collected nutrient data)

Stretch Goal Features:

- Automated watering
- Automated soil PH testing (see Concerns and Considerations)
- Some form of nutrient monitoring (see Concerns and Considerations)
- Runoff collection for further analysis

Anticipated Components:

- Much of what we used on other projects (BME, OLED, perhaps dust and AQ sensors)
- PH Sensor (water PH sensor for manual deployment, or soil PH sensor if practical)
- Solar components
- Ambient Light Detection (photosensor? Something else?)

Concerns and Considerations (Project Risks and Potential Mitigations)

- I initially wanted to be able to monitor PH and nutrient levels from sensors in the soil. From my research, that appears to be pretty much impossible for nutrients (there are products that claim to do it, but the consensus seems to be that those are scams).
- There are also products that claim to test soil PH and can be inserted into the soil. Their accuracy and consistency (particularly while remaining in the soil) are in question. Given enough time, I would love to test one of these products and attempt to implement it, but this may not be the time.
- It seems I won't be able to use a sensor for nutrient levels in soil, so I may include some form of runoff collection and test strips for that water to keep track of nutrient levels. If I do this (and time permitting), I may create a way to input these values into the device to be sent to the cloud.
- If I ultimately decide I need to use a water PH sensor, it can be manually deployed on both runoff water and water that has not entered the soil yet. You can also more directly check soil PH with a soil/water mixture. If I end up with a ton of extra time, I may attempt to automate some form of this soil/water mixing/testing process.
- Automated watering/feeding is an option, but may be difficult to implement on a large enough scale for most gardens.

Other Information:

Project ImplementationTimeline:						
Tasks	12-APR	19-APR	26-APR	3-May	10-May	17-May
Project Plan	X					
Drawings		X				
Flowcharts		X				
Fritzing			X			
Designs			X			
Coding/Testing				X		
Fabrication					X	
Finalizing						X
Documentation						X
CreatePresentation						X
CapstonePresentation						X