Medicine Reminder System

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Problem overview

- Many people struggle to remember to take their medication on time, which can lead to negative health consequences and decreased quality of life.
- Existing reminder systems can be unreliable or difficult to use, especially for older adults or people with cognitive impairments.
- A new solution is needed to help people stay on track with their medication regimens and improve their health outcomes.

Proposed solution

- Our proposed solution is a medicine reminder system using Argon and RPI.
- The system consists of two devices: one to detect which medication has been taken and remind the user which medication to take next, and another to provide auditory reminders at regular intervals.
- The system uses Ultrasonic Distance sensors, LEDs, and a buzzer to detect and indicate medication status.

Technical details

- The Ultrasonic Distance sensors detect the presence of medication containers and send data to the first Argon particle board.
- The first Argon board uses the distance data to determine which medication has been taken and which medication to remind the user to take next.
- The LEDs on the first board indicate which medication to take, while the second board provides auditory reminders via a buzzer.
- The device will send message to IFTTT, then IFTTT will remind user to eat medicine and which medicine the user ate.
- Two devices communicate with MQTT.

Feature of the project

- The system is in the real time system
- The system only operate on the time when user need to eat medicine
- The buzzer will reminder the user no matter the user how far away from the medicine box.
- The message will also send to the phone or smartwatch.

Hardware require

Device: RPI, particle argon

Sensor: ultrasonic sensor hc-sr04

Others: LED, buzzer, medicine box, breadboard, jumper wires.

Software requires

- IFTTT
- Particle IDE
- Python IDE
- MQTT

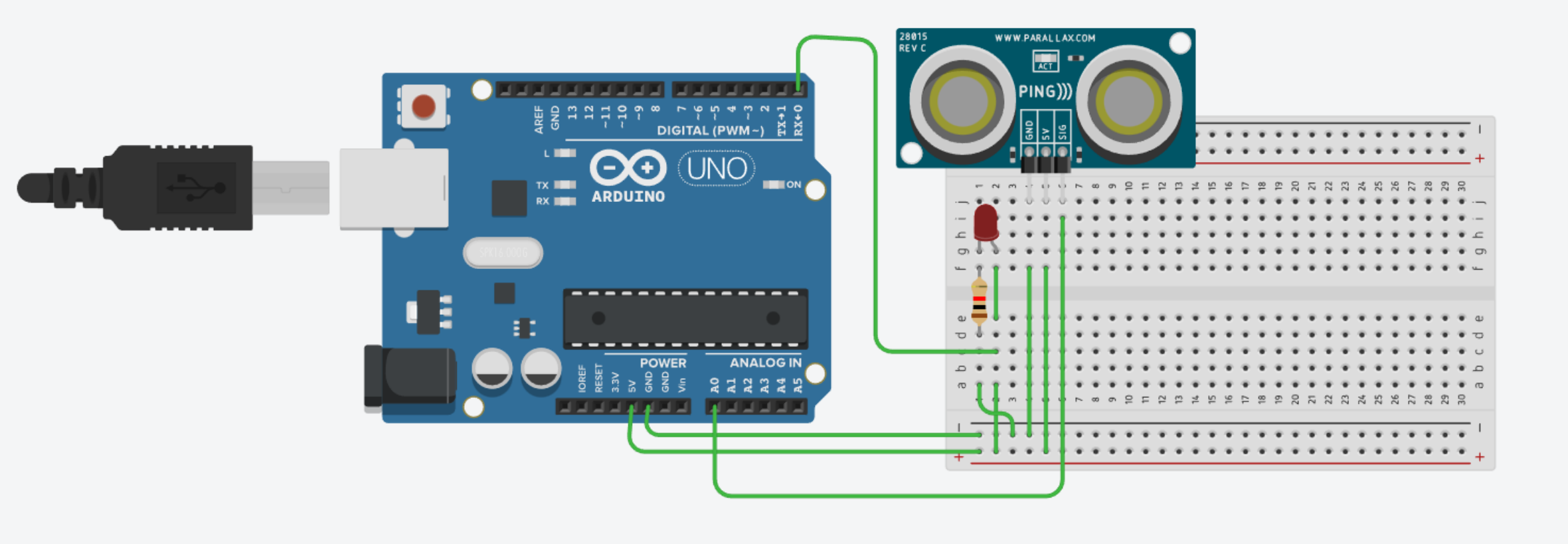
The flow of the system

1. Keep checking the time, the system is off until the reminding time.
2. Send message to MQTT, phone(IFTTT).Also the sensor is on.
3. The buzzer at RPI will turn on to remind user.
4. Once the action detected, it will send message to MQTT.
5. The buzzer at RPI will turn off.
6. The system will wait until the next reminding time.

fault tolerance

- To avoid the wrong operating , I turn off the sensor until the certain time.
- To avoid the wrong reminding , I set the lock for 12 hr.
- To avoid the wrong trigger, I set the max distance to trigger.
- To avoid the fault connection with MQTT, I set another reminding which is the phone reminding.

Device 1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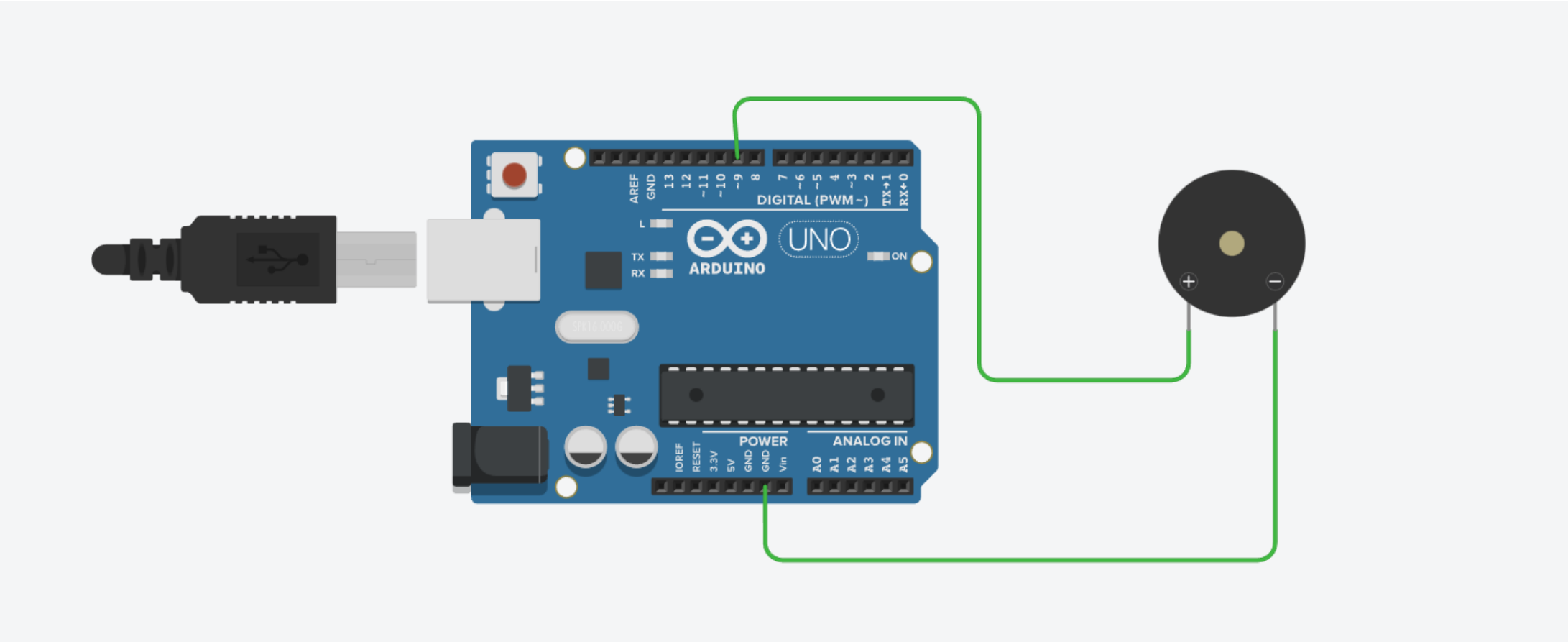
Device 2



Link of Code

- https://github.com/lexlam1524/Project-Artefact.git

Testing approach

During the testing, I usually test each device is working or not.

1. Testing serial monitor: test the Serial.println() work or not
2. HC-SR04 sensor testing: test the sensor working or not
3. Test IFTTT: use Particle.publish() to test the email function.
4. Test LED: use templete to test LED work or not
5. Test MQTT: use the client.publish to test is the connection work or not.
6. Test real time: use Serial.println(Time.hour()) to test the time function

User Manual

1. Copy the code of sensing part and apply to particle argon.
2. Connect the pin of sensor and LED based on the pin in code.
3. Open MQTT website and create a connect and create a topic , name it as “SIT210/medicine”
4. Edit the desiredHour and desiredMinute as you want.
5. Connect the buzzer to RPI as the pin in code.
6. Run the code with “python RPI.py” on RPI.
7. It should be work on the reminding time.

Conclusion

In conclusion, the Medicine Box Reminder IoT project provides a simple and effective solution for medication reminders. During the development process, the main challenge may arise from the hardware connections and configuring the MQTT broker.

If given a second chance, some improvements can be made:

Enhancing the user interface by incorporating an LCD display to show medication details and status.