Setting Up RTC

1. With DS3231 module, plug in the 3V lithium battery, with the engraving facing outward

2. Use female to female wires (unless you want to solder) in the following configuration

   DS3231 SCL → Jetson Nano Port 3 SCL

   DS3231 SDA → Jetson Nano Port 5 SDA

   DS3231 GND → Jetson Nano Port 9? GND

   *Note that because of the battery, we don't plug in VCC (you can if you want)

3. Connect Jetson Nano to internet to download packages and get current time(ethernet)
   a. Use USB to ethernet and configured port 4.1 062 D1 (Configured By Ted)
   b. OR Bring to your own home internet and plug into ethernet

4. Download package smbus2 With the following command
   a. sudo pip3 install smbus2 (might require installing pip)
      i. sudo apt install python3-pip (if needed for pip)

5. Test to see if the DS3231 is connected by running command in terminal
   a. sudo i2cdetect -y 1
   b. If done properly you should see 0x68 in output

6. Try running the python scripts created using python3
   a. rtc_read.py → will output the time on the rtc
   b. rtc_write.py → will place the time from the nano, onto the rtc device

7. Set sudo settings to allow changing device time without password
    a. sudo usermod -aG i2c username
        i. So that password not needed for i2c communication
    b. sudo visudo
        i. Once editor is open, insert line:
            1. ALL ALL=(ALL) NOPASSWD: /bin/date *, /sbin/hwclock *
        ii. This makes it so that no password needed for editing system time
        iii.

Notes:

- Remember to set your RTC time when connected to ethernet to get it setup
- Batteries supposedly last around 2 years, and are very cheap and easy to switch out

Scripts for rtc

The python scripts will be in the SSD->WALLE-2.0->rtc Folder.

1. python3 rtc_read.py → will output(read) the time on the rtc module
2. python3 rtc_write.py → will place the time from the nano, onto the rtc device
3. python3 nano_setTimeRTX.py → will place time from the rtc device onto the nano's system clock. This is the script that runs at the beginning of control_loop.py (on startup).

Manually Setting System Clock

The best way to set the nano's system clock is to simply plug it into ethernet. However, if that is not an option, you can choose to manually set it with this command

1. Open the terminal on your Jetson Nano.

Use the `date` command to set the time. The format for the `date` command is:

```
sudo date MMDDhhmm[[CC]YY][.ss]
```

2.
    - `MM` is the month.
    - `DD` is the day.
    - `hh` is the hour in 24-hour format.
    - `mm` is the minutes.
    - `CC` is the first two digits of the year (optional).
    - `YY` is the last two digits of the year (optional).
    - `.ss` is the seconds (optional).

For setting the time to 9 PM, you will need to specify the date and time. For example, if today's date is July 10, 2024, you can set the system clock to 9 PM as follows:

```
sudo date 07102100
```

This command sets the date to July 10 and the time to 21:00 (9 PM in 24-hour format).

3. (Optional) Apply your changes to the hardware clock, so the last seen time will be remembered when powered off and on. (Not needed with external rtc that we have).

$ sudo hwclock -w