Lab 0: Arduino Nano Every

General Information

The Arduino Nano Every is a new version of the Arduino Nano that takes advantage of the ATMEGA4809 microcontroller instead of the previously ubiquitous ATMEGA328. This package features 2 LEDs on either side of the micro-USB connector, one for power (green) and another internally connected to pin 13 (red). If you consider the USB port to be the 'up' of the board, these LEDs fall on the port's right and left, respectively. One of the most impactful differences between this board and boards used in previous semesters is the lack of pin numbering on the board itself. To the end, it will be helpful

Figure 1. The Arduino Nano Every with pins

to reference the Arduino Nano Every pinout. While a new chip is used on this board, we don't see many changes in capability over the previous boards used in ECE 206. Programming and the speed of the microcontroller are configured to function similarly to that of previous boards. Although the board is set up to run the same way by default, there are ways to increase the clock speed to 20 MHz (compared to the standard 16 MHz), although this does require greater input power stability. This increased need for stability becomes a problem when large ripples in voltage supply from components with significant power draw, such as motors.
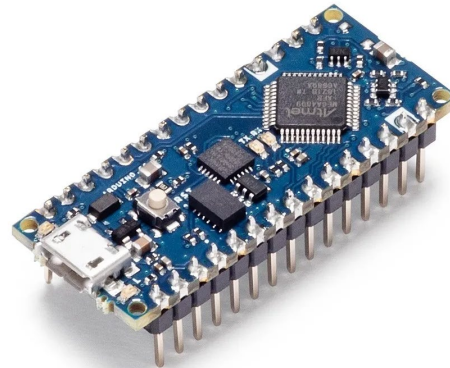
Installing the Arduino Libraries

This semester for ECE 206, we are using the Arduino Nano Every. As mentioned in the above section, it leverages a chip that requires a different board file than the previous Arduino boards. Therefore, to access this new board, you will have to download the "Arduino megaAVR Boards" board file in the "Boards Manager," see Fig. 2. below for the steps to do this. While this has been completed on the lab computers, for personal computer installations, follow the detailed steps.

Pinout:

Again, as mentioned above, this semester, we're using the Arduino Nano Every, which has a different pinout from the Arduino Uno and Red Board. The pinout for the Nano Every is similar to that of the regular Nano and can be seen below in Fig. 3.

Introduction Breadboard Setup

For ECE 206, we will be using a breadboard and Arduino Nano Every. To use the full breadboard, it is recommended to wire the power and ground busses together. These busses are on either side of the breadboard and should also be connected to the Nano Every, as shown below in Fig. 4. This allows for easier access to power and ground as you make your circuits and doesn't result in the USB cable covering parts of the breadboard. Although wiring from the digital and analog pins does become harder, and at the least, more congested, tweezers are recommended for bending wires and resistors to help make these circuits.
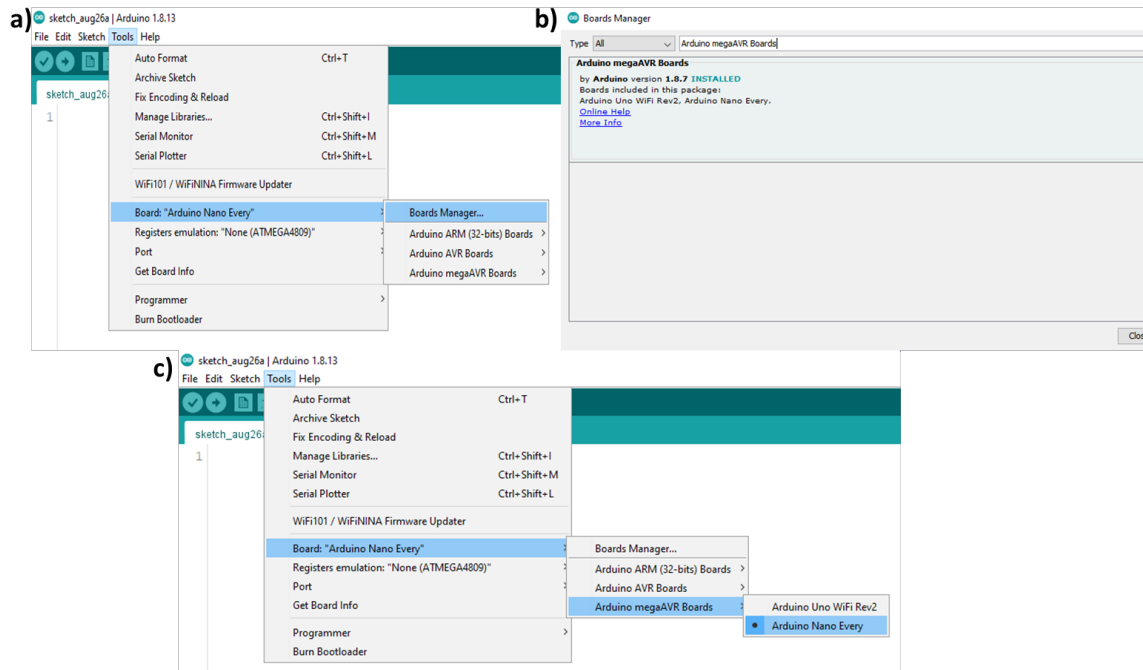
Figure 2. a) The path of the "Boards Manager" window. b) The "Boards Manager" window with the required board library for ECE 206. c) The location of the board file for the Arduino Nano Every.
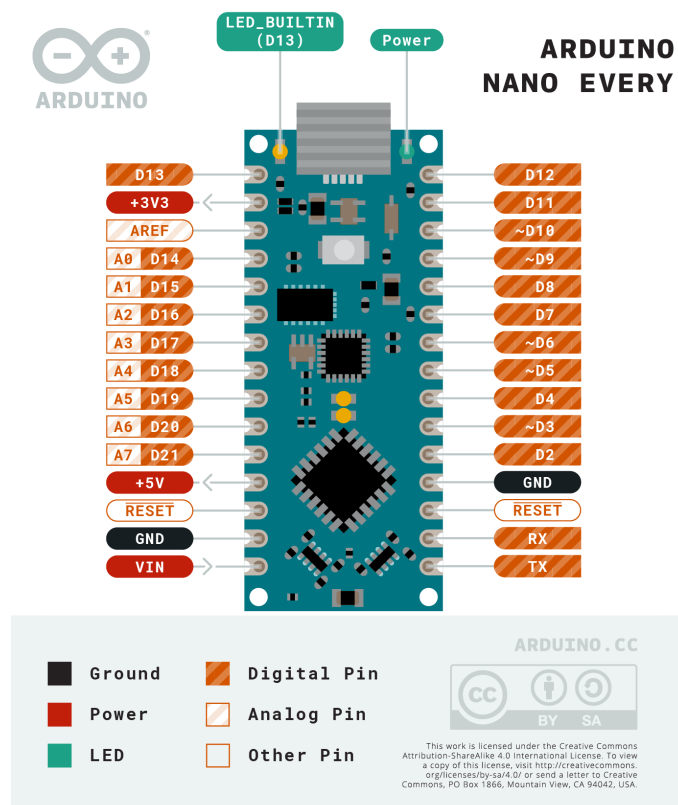

Figure 3. The relevant pinout for the Arduino Nano Every. Tildes (~) indicate PWM capable pins. A0-A7 indicate pins connected to analog-to-digital converters (ADCs) and may be used with the "analogRead()" function as well as normal digital IO.
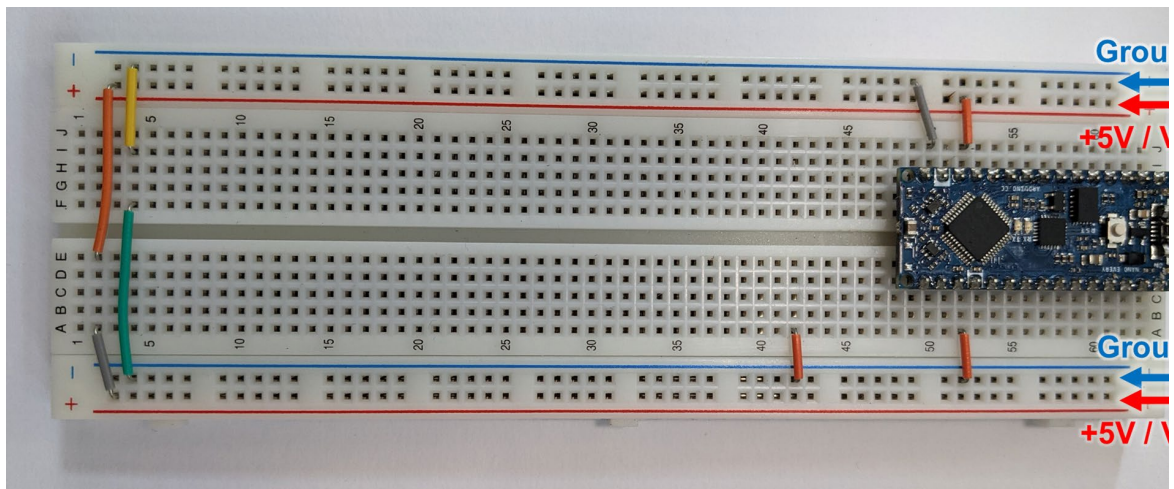
Figure 4. A recommended approach to setting up a breadboard for ECE 206 that provides 5V (aka V_{cc} or 'power') and ground over the full breadboard.