**I2C (Inter-Integrated Circuit):**

* Only requires two lines, SDA and SCL
  + SCL = Clock Signal
    - Generated by the Master to communicate with the Slaves
  + SDA = Data Signal
    - Needs proper addressing and an acknowledge bit before data can be communicated btwn the Master and the Slaves
* One or more Master chips can handle multiple Slave chips, roughly up to 1008 of them
* Most of the type of sensors we wanted to implement support I2C so I2C was a natural choice

**Piping:**

* Only in Linux or Unix systems
* A pipeline is a sequence of processes chained together by their standard streams, i.e. the output of one process is sued as the input of another process.
* We used a named or FIFO pipe, which you write and read from and, in our case, we had our information written and read from a file in memory so as to avoid wearing out our microSD Card
* We did this so we can send information from our sensors handled in Python to our group members so the information can be sent over a server
* Our Python file writes to the pipe and our group members who send the information over the server read from the pipe in Javascript

**Timing:**

* We have our timer handled via a thread, that acts as a function or task, contained within processes, and corresponds to an object. When we initiate our timer, it creates a thread and then repeats the task within the timer function after a second is passed

**TSL2561 (Digital Luminosity/LUX/Light Sensor):**

* Range – 0.1 to 40,000 LUX
* Uses I2C and has three different addresses
  + GND = 0x29
  + VCC = 0x49
  + Floating = 0x39
* Built in ADC so it can be used on any microcontroller, even those without analog inputs
* Low current draw (0.5 mA when actively sensing)
* Two photodiodes, one for full spectrum light and the other for infrared light
* Has a voltage regulator so input voltages above 3.3 V will be stepped down

**Si7021 (Temperature & Humidity Sensor):**

* Humidity Range – 0 to 80% +/- 3%
* Temperature Range – -10 to +85\*C +/- 0.4\*C
* Has a voltage regulator so input voltages above 3.3 V will be stepped down
* Uses I2C and has an address of 0x40
* The calibration data is stored in an on-chip non-volatile memory
* Uses industry-standard CMOS and low-K dielectrics as a sensor

**PIR Sensor:**

* Has a 3.3V voltage regulator but the ideal input voltage is at least 5V
* Sensitivity Range – Up to 20 feet, 110\* x 70\* detection range
* Small trimmer potentiometers to adjust the sensitivity or the timeout for how long the digital output remains high
* It has a digital high of 3V when motion is detected and a digital low of 0V when idle
* It has a PIR sensing element, RE200B, a decoder chip for the PIR sensing element, BIS0001, and a lens to help with the detection area, NL11NH
* The PIR sensor has a detecting area through two slots that see out past some distance. When the sensor is idle, both slots detect the same amount of IR, but, when a warm body, like a person, passes by, it intercepts one half of the PIR sensor, which causes a positive differential change between the two halves. When the warm body leaves the sensing area, it causes a negative differential change. These change pulses are what lead to the low and high digital output signals