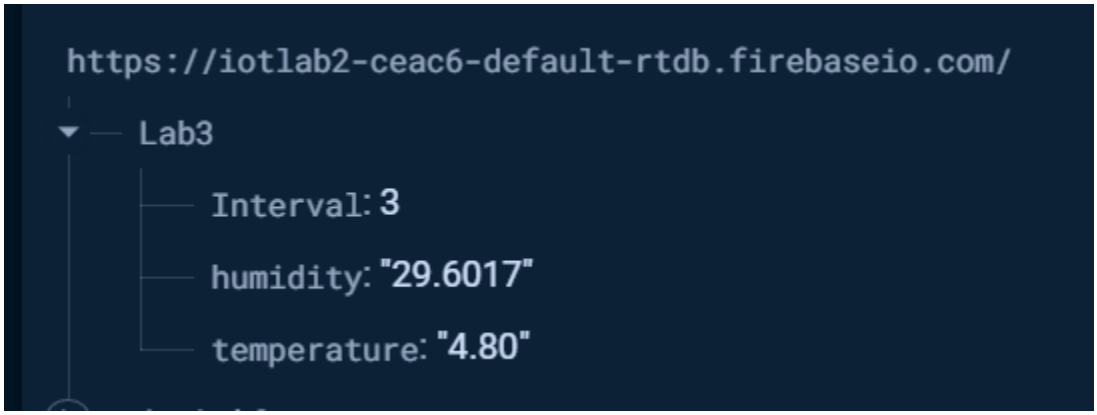
Internet of Things: Lab3 - Report

Brandon Cano
Ian Kuk

Screenshots:

```
Temperature Received: 17.20
Updated database with: Temperature: 17.20
New Interval: 3 seconds
Updated database with: Humidity: 28.4700
Temperature Received: 3.60
Updated database with: Temperature: 3.60
Updated database with: Humidity: 29.6017
Sent: 3
```

```
10:42:45.248 -> Temp: 3.60
10:42:46.360 -> [Recv] 3
10:42:46.360 -> Temp: 4.80
10:42:49.429 -> Temp: 9.60
10:42:52.561 -> Temp: 19.60
10:42:55.633 -> Temp: 20.40
10:42:58.773 -> Temp: 18.80
10:43:01.874 -> Temp: 4.00
10:43:04.970 -> Temp: 9.60
```



Our Lab 3 objective was to modify Lab 2 by adding temperature data collection over Bluetooth from our Arduino Nano 33 BLE while also adding the ability to control the interval at which the temperature and humidity data are harvested. We used Environmental Sensing Service (ESS) and UART service to communicate between the two boards

Initially we struggled with getting even the basic provided examples to work. Our PI refused to connect to our arduino and would always say “Terminated by local”. Because of this we struggled to get a good start to the lab. After struggling for many days the solution seemed to be time, because one day it just decided to work out of the blue. Another struggle is two of our group mates in the larger IoT groups had a broken arduino. We lent them ours so they could complete the lab but this also delayed us more.

Our setup started with getting the PI to connect to the Arduino via the Mac address, and then getting our PI to connect to firebase. Our previous labs were pivotal in helping us to get the proper sensor data and connections to firebase.

We used the ESS to monitor and transmit temperature data from the Arduino. This data was sent using custom BLE characteristics within the ESS, that were then formatted to send the proper temperature values. We also implemented the UART service to communicate between the Arduino and the PI. This service facilitated the communication of the temperature data and allowed us to properly send the data to firebase.

The IoT aspects of this lab came from the connection of two devices communicating and sharing information between each other. That data would then be harvested and sent to a database, of which the database could also change the collection time on one of the devices. It was the interconnectivity of three devices that made this lab incorporate a lot of IoT principles.