Ali Asadi
Github root directory: https://github.com/aliasadivet/Lab_Submition-.git

Final Project

YouTube link: https://youtu.be/rMDKvfpJc7s

For this project I used CC1350 and CC1352R.

CC1350 is configured as sensor which collects data Temperature and Humidity from Si702 Sensor connected via I2C interface.

CC1352R is configured as Collector which receives data from Sensor and send it out via serial port which is connected to BBB.

All python dependencies are download for BBB and python script is written to parse the incoming String and store it in an Excel format.

Python Script to Parse the incoming string:

```
import serial

import time

import csv


ser = serial.Serial('/dev/ttyACM0', 115200)

ser.flushOutput()

ser.flushInput()


while True:

    str = ser.read(256);

    tempPosition = str.find("Temperture = ");

    if tempPosition != -1:

        end = str.find(",", tempPosition)

        if end != -1:
```

Grading scheme: 30% Coding, 30% Documentation, 40% Execution/Video.

```
            temperature = str[tempPosition + 13 : end];
            print("Temperature : "+ temperature);
            with open("data.csv", "a") as f:
                writer = csv.writer(f, delimiter=",")
                writer.writerow([time.time(),"Temperature : ", temperature.strip()])
    humidityPos = str.find("Humidity = ")
    if humidityPos != -1:
        end = str.find(",", humidityPos)
        if end !=  -1:
            humidity = str[humidityPos + 11:end]
            print("Humidity : " + humidity);
            with open("data.csv", "a") as f:
                writer = csv.writer(f, delimiter=",")
                writer.writerow([time.time(),"Humidity    : ", humidity.strip()])
```

Received Stored Data in CSV Excel format:

1576499583.81213,Humidity   : ,51%

1576499589.803904,Temperature : ,30C

1576499589.804509,Humidity   : ,54%

1576499592.822611,Temperature : ,30C

1576499592.826445,Humidity   : ,59%

1576499598.81145,Temperature : ,30C

1576499598.819301,Humidity   : ,58%

1576499604.802647,Temperature : ,29C

1576499604.808734,Humidity   : ,53%

1576499607.82716,Temperature : ,29C

1576499607.828704,Humidity   : ,45%

1576499613.818687,Temperature : ,28C

1576499613.820592,Humidity   : ,39%

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1576499619.81072,Temperature : ,27C

1576499619.819391,Humidity : ,36%

1576499625.801801,Temperature : ,27C

1576499625.807387,Humidity : ,35%

1576499628.822603,Temperature : ,27C

1576499628.826451,Humidity : ,33%

1576499634.820282,Temperature : ,26C

1576499634.822395,Humidity : ,32%

1576499640.801789,Temperature : ,26C

1576499640.80843,Humidity : ,31%

1576499646.804355,Temperature : ,26C

1576499646.804954,Humidity : ,31%

1576499649.82264,Temperature : ,25C

1576499649.82423,Humidity : ,30%

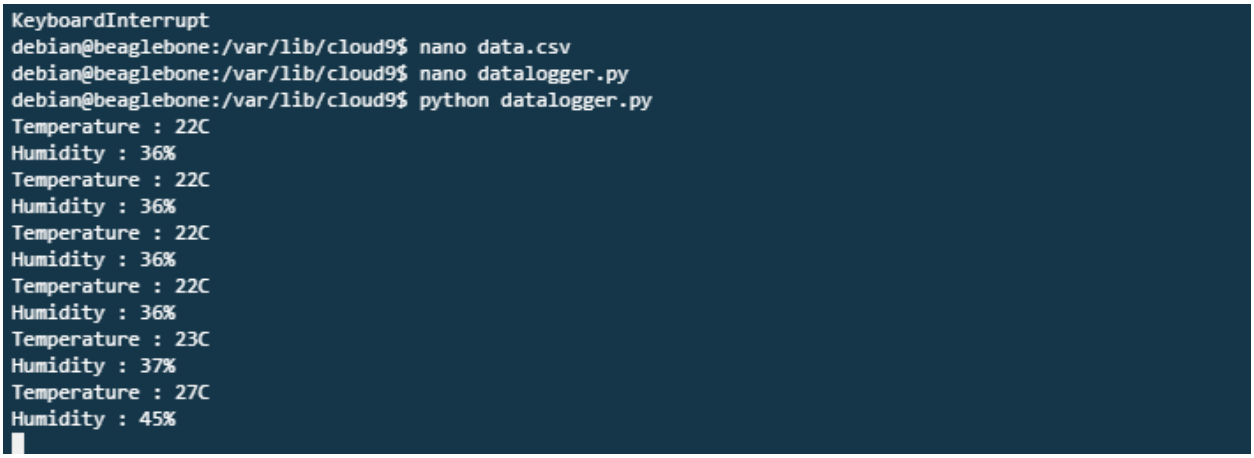
1576499655.810024,Temperature : ,25C

1576499655.810682,Humidity : ,30%

1576499661.8021,Temperature : ,25C

1576499661.808254,Humidity : ,30%

Screenshot of collected data



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Code to print received data

```
CUI_statusLinePrintf(csfCuiHndl, deviceStatusLine, "Sensor - Addr=0x%04x, Temperture = %dC, Humidity = %d%%, RSSI=%d", pSrcAddr->addr.shortAddr, pMsg->humiditySensor.temp, pMsg->humiditySensor.humidity, rssi);
```

Code to read Temperature and Humidity

```
int     sample;
float temperatureref = 0;
float humidity = 0;
/* Take 20 samples and print them out onto the console */
for (sample = 0; sample < 20; sample++) {
   txBuffer[0] = Si7021_TMP_REG;
   if (I2C_transfer(i2c, &i2cTransaction)) {
/*
* Extract degrees C from the received data;
* see Si7021 datasheet
*/
        int32_t temperature = (rxBuffer[0] << 8) | (rxBuffer[1]);
        temperatureref += (((175.72 * temperature)/ 65536) - 46.85);
   }
   txBuffer[0] = Si7021_HUM_REG;
   if (I2C_transfer(i2c, &i2cTransaction)) {
        /*
        * Extract degrees C from the received data;
        * see Si7021 datasheet
        */
```

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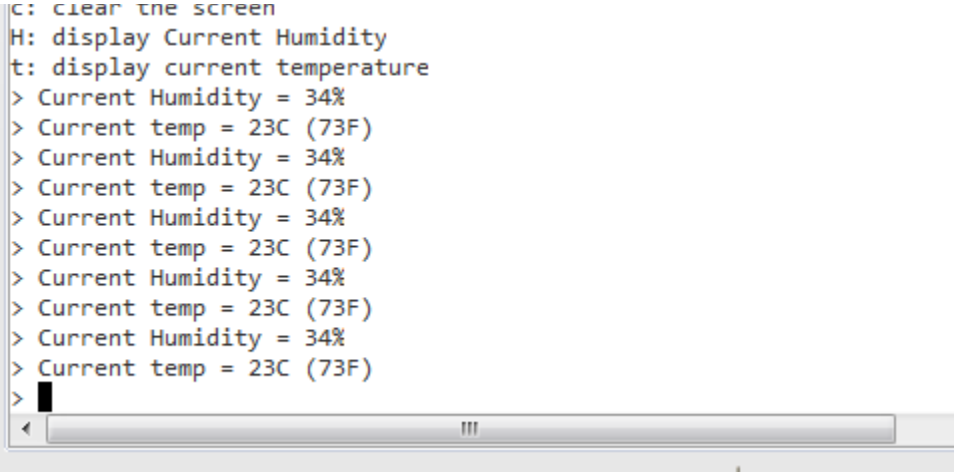
```
                int32_t humid = (rxBuffer[0] << 8) | (rxBuffer[1]);
                humidity += (((125 * humid)/ 65536) - 6);          }
    }
    pthread_mutex_lock(&temperatureMutex);
    Humidity = humidity/20;
    temperatureC = temperaturef / 20.0 ;
    temperatureF = (temperatureC * 9.0/5.0) + 32;
    pthread_mutex_unlock(&temperatureMutex);
```

Update Sensor data

```
static void readSensors(void)
{
   humiditySensor.temp = (int)temperatureC;
   humiditySensor.humidity = (int)Humidity;
}
```

Output from the sensor



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