Ahmedabad University

ENR305 Sensors, Instruments and Experimentation

Temperature and Humidity Sensor with Bluetooth Feature

Section 1 Monsoon Semester 2021

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Group - 16

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LIST OF FIGURES

1   OBJECTIVES

The objectives of our project are:

- To design a portable device that can measure the temperature and humidity of the surrounding environment using DHT11 Sensor.
- To construct a wireless connection which can provide the handy information about variation in measurements of temperature and humidity.
- To improve productivity by balancing the environment.
- To utilise it in situations when air conditions are extreme or need to be managed for a variety of reasons.
- Temperature and humidity are important parameters in various fields, such as the biomedical industry for drugs and cell methods, food, paper mills, metrological, semiconductors, and so on. Thus, the objective is to improve productivity by balancing the environment.

2   OUTCOMES

An application that displays the temperature and humidity measurement has been created on the MIT-App inverter. It is connected with the circuit through a bluetooth module (HC-05 module). The user can download the app and connect it via Bluetooth to see temperature and humidity measurements. The circuit is also connected to an LCD screen, which allows the user to see the measurements on the screen. Temperature and humidity are important parameters in various fields, such as the biomedical industry for drugs and cell methods, food, paper mills, metrological, semiconductors, and so on.

3   COMPONENTS

- Arduino Uno
- DHT11 temperature and humidity sensor
- HC-05 Bluetooth module
- Jumper wires
- Resistor- 4.7k
- Resistor 1k

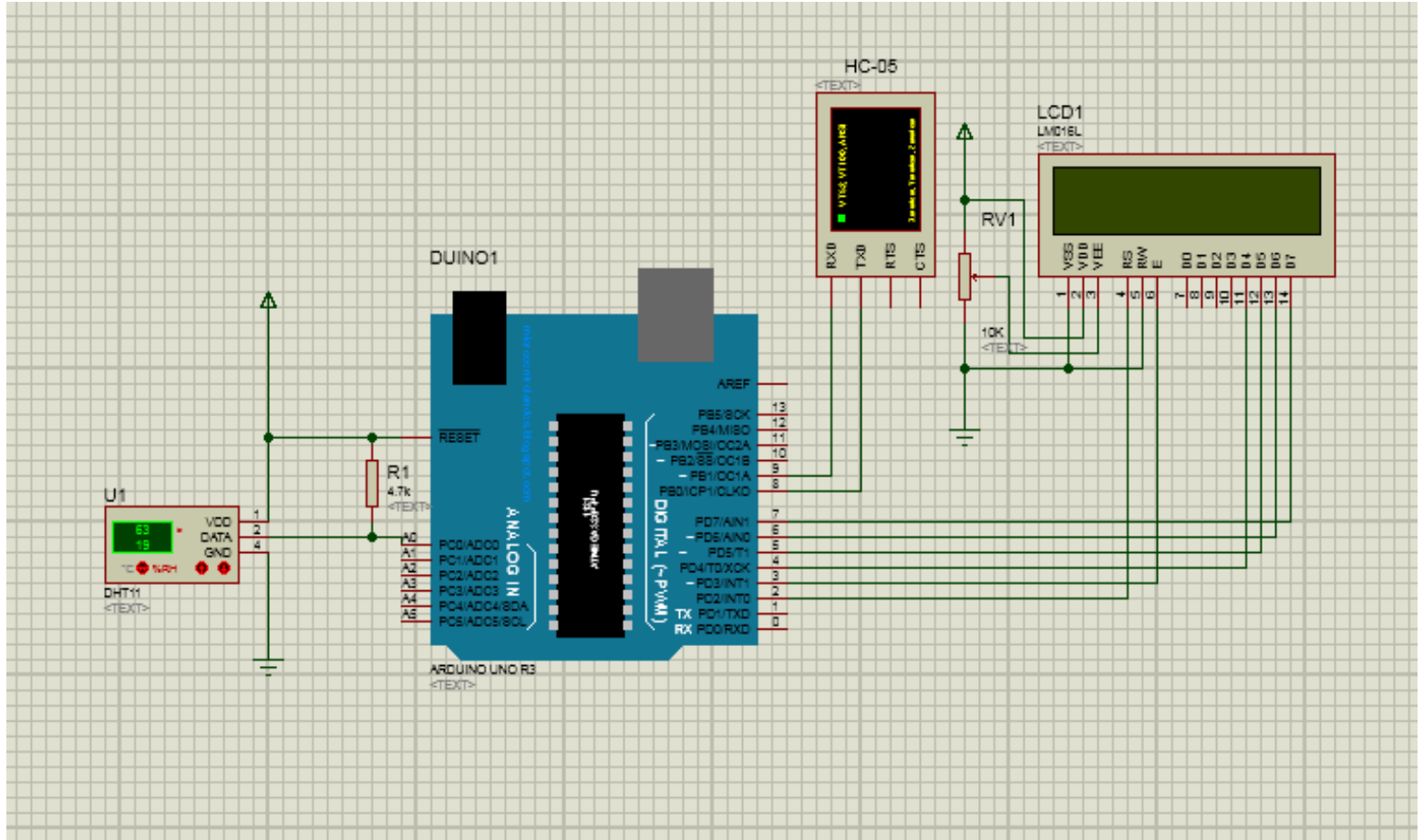- 16x2 LCD display

4   CIRCUIT DIAGRAM

Figure 1: Circuit diagram for temperature and humidity sensor
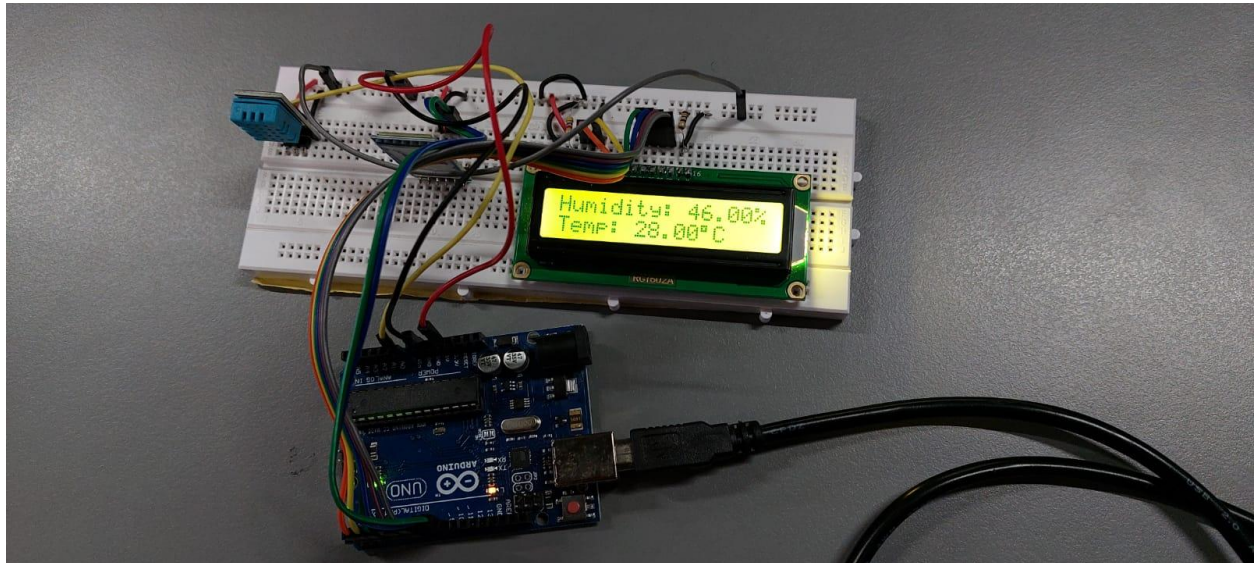
5   CODE

6   IMAGES

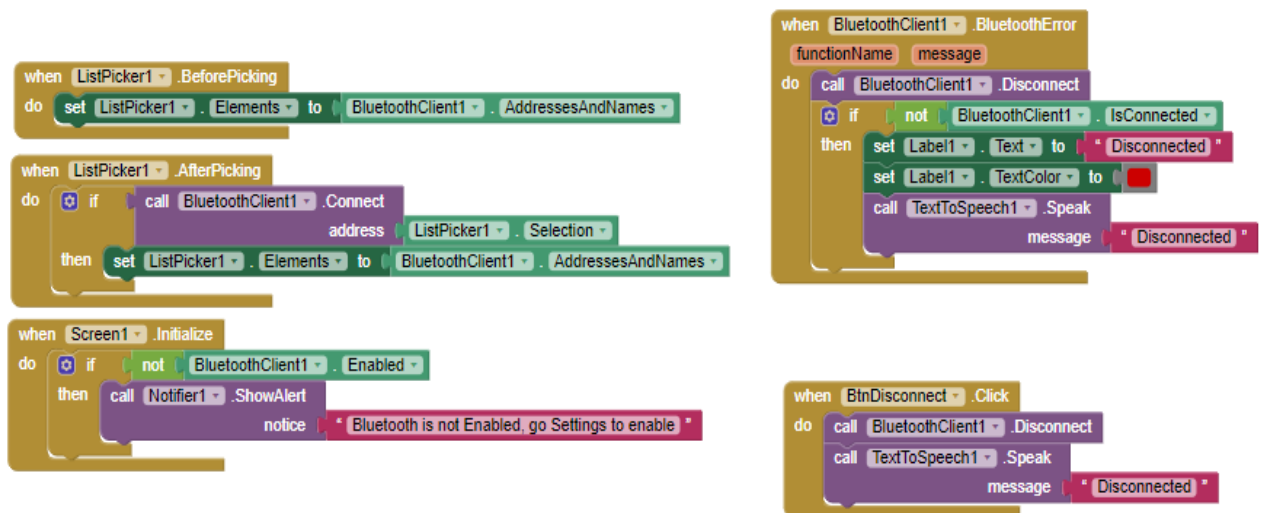*Figure 2: Wiring DHT11 Sensor, HC-05 module and LCD Display to Arduino Uno*

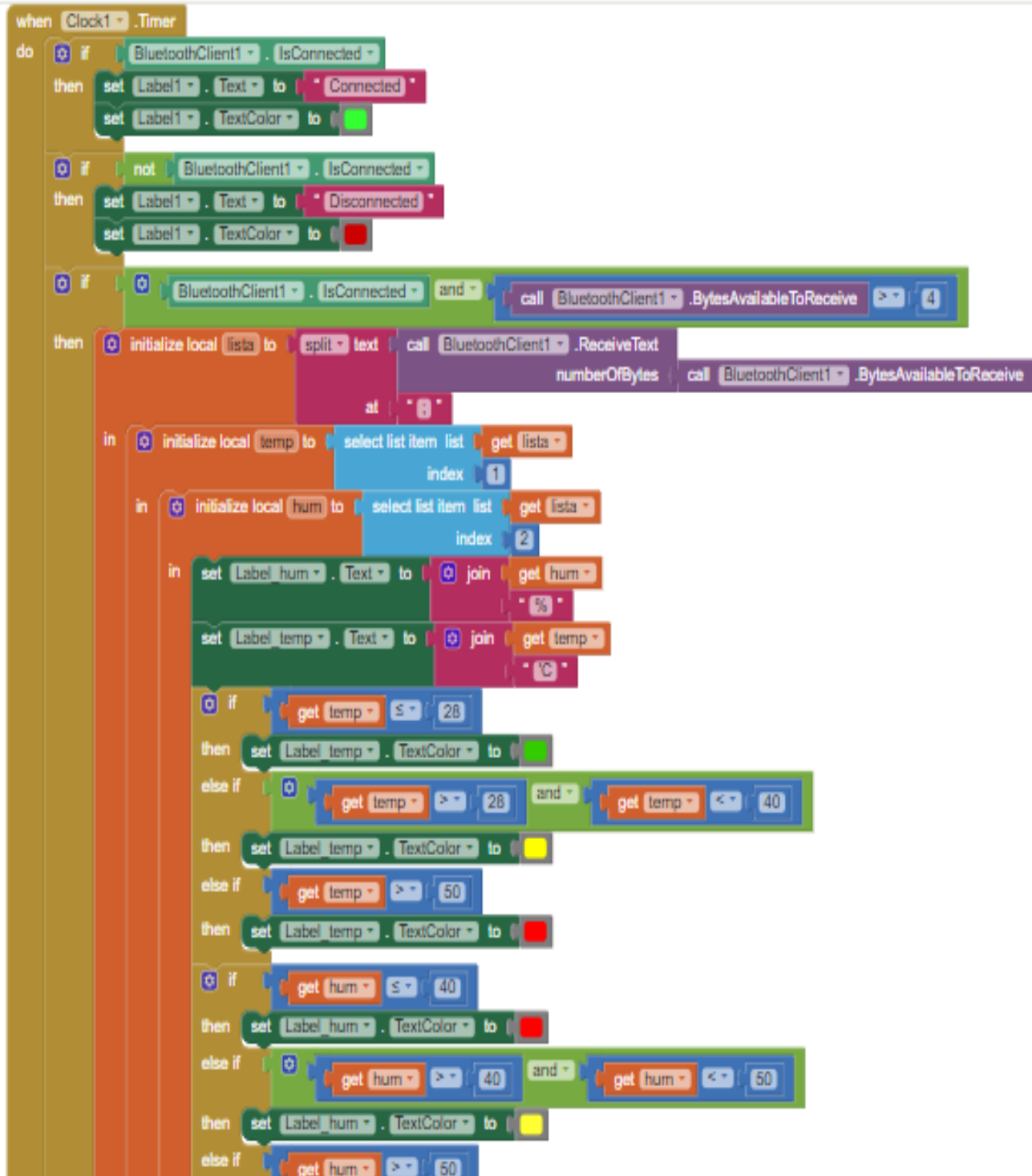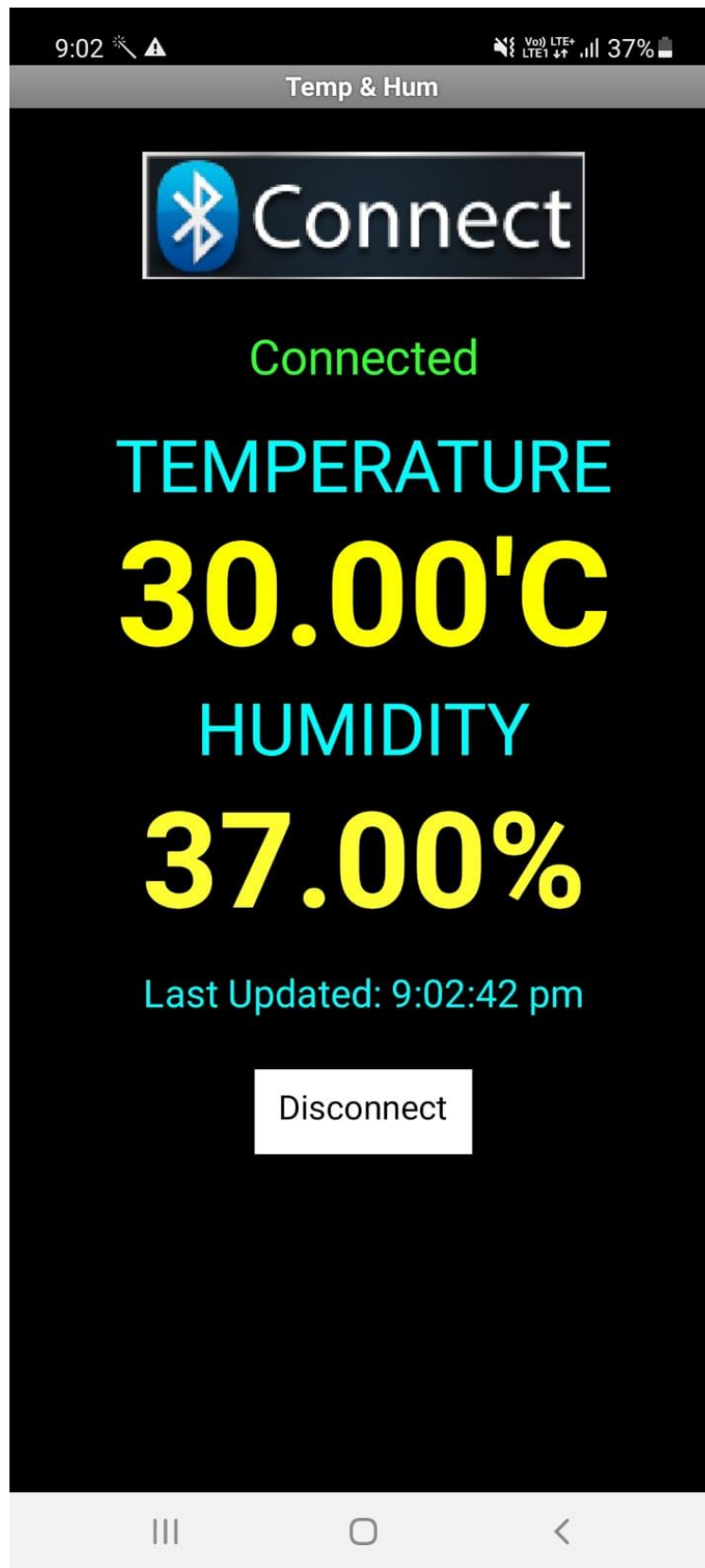*Figure 3: Block Code for application I*

Figure 4: Block Code for application II

Figure 5: Screenshot of home screen of the application

7 Setup/Connection

Figure 2 shows the DHT11 sensor, which has three pins namely Vcc, Data out and Ground. In our circuit, the Vcc pin of the DHT11 sensor is connected to the positive of the breadboard and the ground pin is connected to the negative of the breadboard respectively. The Data Out pin of the DHT11 sensor is connected to the Analog pin A0 of Arduino Uno.

Similarly, the HC-05 module has six pins namely State, RX, TX, Vcc, GND, EN. The Vcc pin and the ground pin are connected to the positive and negative of the breadboard respectively. TX (Transmitter) pin is connected to the digital pin "8" and RX (Receive) pin is connected to the digital pin "9" of Arduino respectively.

Connections in LCD Screen:

LCD pins   **Arduino Pins**

Pin D7   ->   Digital pin "7"

Pin D6   ->   Digital pin "6"

Pin D5   ->   Digital pin "5"

Pin D4   ->   Digital pin "4"

Pin E   ->   Digital pin "3"

Pin R/W   ->   Ground

Pin RS   ->   Digital pin "2"

Figure 3 and 4 shows the block code required in the front-end environment. We have added non-visible components such as Bluetooth Client, Notifier, Clock for displaying the real time. We have also added the features of changing the colors based on the range of temperature and humidity i.e.,

- if temperature < 28, then the output value will be displayed in green color

- if temperature is between 28 to 40, then the output value will be displayed in yellow color
- If temperature > 40, then the output value will be displayed in red color
- If humidity < 30, then the output value will be displayed in red color
- If humidity is between 30 to 50, then the output value will be displayed in yellow color
- If humidity > 50, then the output value will be displayed in green color

8   Working

Sensor

HC-05 Module

9   References

https://www.theseus.fi/bitstream/handle/10024/142235/Dangi_Nagendra.pdf?sequ

https://www.researchgate.net/publication/320852964_Temperature_and_Humidity_Measurement_System

https://www.electronicsforu.com/tech-zone/electronics-components/humidity-sensor-basic-usage-parameter

https://www.comptus.com/blog/the-importance-of-temperature-and-humidity-sensors/

https://www.electronicwings.com/sensors-modules/bluetooth-module-hc-05-

https://d1wqtxts1xzle7.cloudfront.net/57037472/IRJET-V5I5297-with-cover-page-v2.pdf?Expires=1636819465&Signature=gclp-C~bVyLbBhjt9BMaIMx16uVMW0kcEUUbda1HlJFS7ilJnR5O0b7KPqYfKQvopv~vX2hP0CgBIoggrZtgA5013gd8Xm2~fihrjrN6eZHgdHNQnIo7biB5~CNA~JkfQ0hypB7ZUIadeiuM4bwc3C0Pvz2SFNtoqLlp9PisdR3httEwfLd1yIvRUqJcGNAMsGCPfqnIi41HHSiZtthsAPQdXQp4M2XSTlZrehdYSV3R4P

pSYn1dxBybQX4qhEp~WVP5ow-PL6f3tz784jPiQQovgijPILxlHNWJ~ZHxE~HmwW7LgPRPl5b47ejdYa9eV7fcSUu3wndMs945bCOgFQ__&Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA