TED UNIVERSITY

2023 Fall

CMPE 453 Embedded Systems

LAB REPORT # 3

Lab Name: BUTTON CONTROLLED I2C DATA TRANSFER

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Section: 2

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I.   Tasks

The steps followed to fulfill the tasks required in this laboratory can be listed as follows. Firstly, a working physical circuit was established with Arduino Uno, Arduino Base Shield, Grove Button, and Grove LCD Screen.

- Arduino base shield connected to Arduino-Uno with pins.
- Grove Button connected to D2 digital port on base shield.
- Grove LCD Screen connected to any I2C port on base shield.

Then, microcontroller was programmed in C programming language with Arduino IDE to display a "Hello" message on LCD screen initially. Also, number of button presses keeped tracked and displayed on LCD. If there is 5 presses in 3 second, the number on LCD display is set to 0.

II.   Hardware Implementation

Connections were made as per the provided instructions. In the image below, you can observe that, base shield has connected to Arduino Uno. After that, Grove Button and Grove LCD screen connection has been established with digital port D2 and any I2C port respectively.
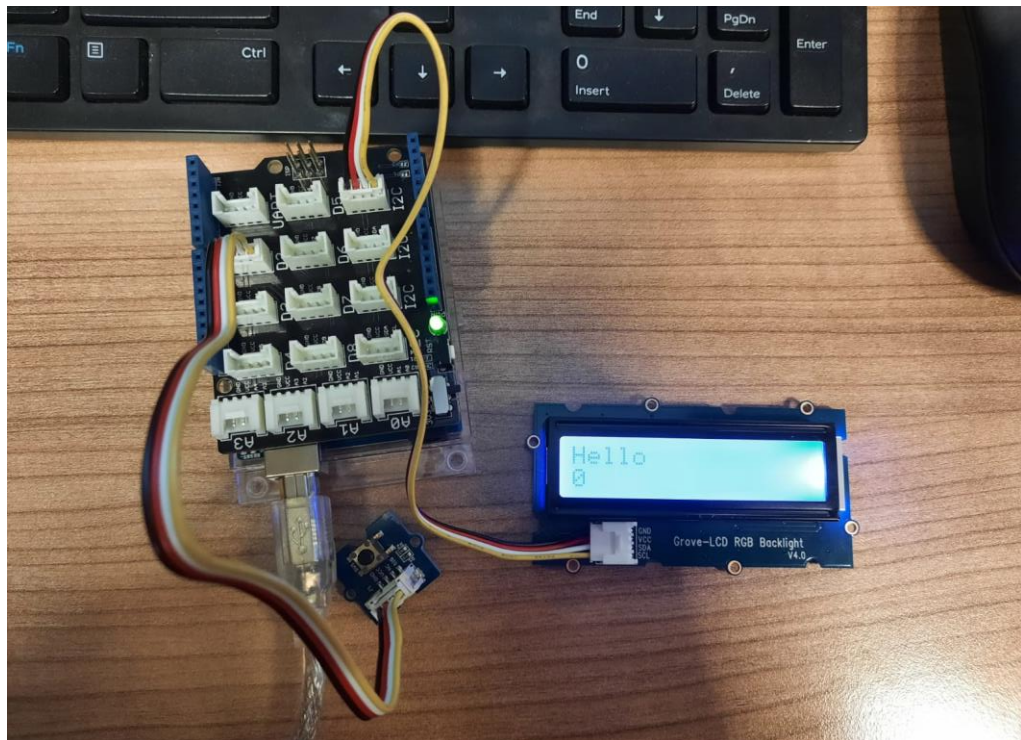

Figure 1 – Arduino, Arduino base shield, Grove button and Grove LCD screen with the necessary connections provided and working as desired. (October 20, 2023 Lab-3)

III. Code

- *pinMode(2, INPUT):* Configures digital pin 2 as an input.
- *lcd.begin(16, 2):* Initializes the RGB LCD with 16 columns and 2 rows.
- *lcd.setRGB(colorR, colorG, colorB):* Sets the initial color of the LCD.
- *lcd.print("Hello"):* Prints the "Hello" message on the LCD.
- *init_time = millis():* Records the initial time using the *millis()* function
- *int button_state = digitalRead(2):* Reads the state of the button connected to digital pin 2.
- If the button is pressed *(button_state == HIGH):* Increments *button_counter.*

This code counts button presses and displays the count on an RGB LCD. If there are more than 5 button presses within a 3-second window, it resets the LCD display to 0.

IV. Critical Analysis / Conclusion

In conclusion, the laboratory tasks were successfully accomplished, resulting in a functional button-controlled I2C data transfer system. The successful display of the "Hello" message and the accurate tracking of button presses demonstrate the proper functioning of the program. Overall, this laboratory provided valuable hands-on experience in embedded systems programming.