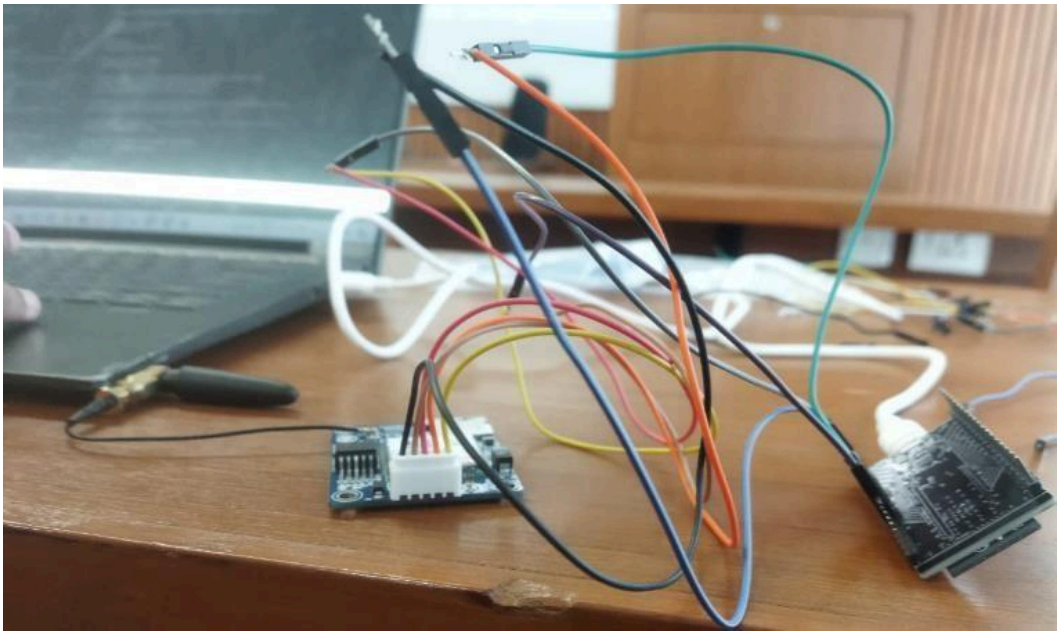
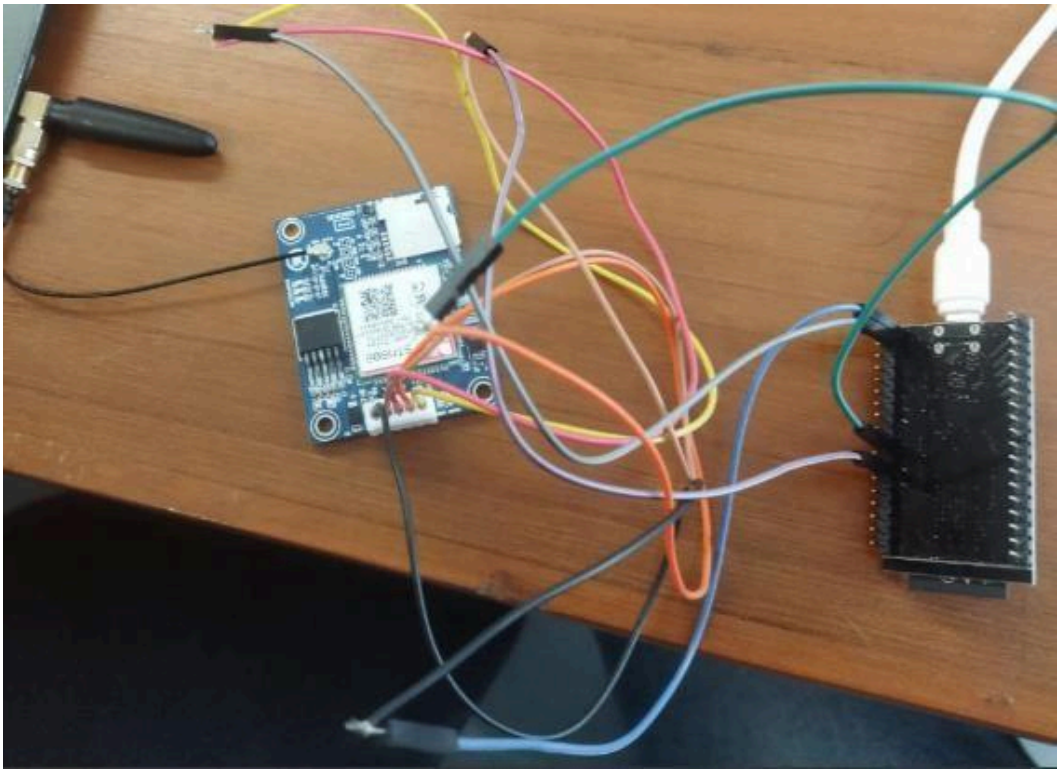
Part A
Class B Tech CSE 4th Year **Sub: Internet of Things Lab**
Aim: Study and Interfacing of GSM, and Bluetooth modules with Arduino/ ESP board
Prerequisite: Basics of programming, microcontrollers and basic electronics
Outcome: 1. Learning of GSM network. 2. Working with GSM modules and so cellular network 3. Connect the Bluetooth of the ESP board with your mobile phone's Bluetooth network to control the LED on/ off.
Theory: **1. Study of ESP32 and nodeMCU microcontroller board (ESP8266)** **2. Study of GSM and Bluetooth.** **3. Interface microcontroller Arduino/ ESP with GSM module and perform send/Receive, and call functions.** **4. Connect with Bluetooth of the ESB board with your mobile phone to control LED on/off**

Part B (Write for an individual)
Steps: 1. Insert the SIM card into the GSM module and connect its VCC and GND to the 5V/3.3V and GND pins of the Arduino/ESP board, respectively. 2. Connect the GSM module's TX to the Arduino/ESP RX and RX to the Arduino/ESP TX. 3. Connect the Bluetooth module's VCC and GND to the Arduino/ESP board's 5V/3.3V and GND pins. 4. Connect the Bluetooth module's TX and RX to the Arduino/ESP digital pins, such as D2 and D3. 5. Ensure all connections are secure before powering the circuit.
Output:





Observation & Learning:

The GSM module successfully registered on the network, as shown by the correct AT command responses. SMS messages were sent and received accurately, with confirmations displayed on the Serial Monitor. The Bluetooth module paired successfully with a smartphone, and data was exchanged between the Arduino/ESP board and the Bluetooth device, with communication visible in the Serial Monitor.

Through this experiment, you learned how to interface a GSM module with Arduino/ESP, using AT commands to manage SMS communication. You also understood the importance of proper voltage levels and connections for successful network registration and communication. Additionally, you gained hands-on experience in setting up a Bluetooth module and

establishing wireless communication between the Arduino/ESP board and a Bluetooth-enabled device, along with developing skills in writing and modifying code for serial communication and data transmission using the Bluetooth module.

Conclusion:

In conclusion, the experiment successfully demonstrated the interfacing of GSM and Bluetooth modules with an Arduino/ESP board. The GSM module was effectively used for SMS communication, and the Bluetooth module enabled seamless wireless data exchange with a Bluetooth-enabled device. This experiment provided practical experience in serial communication, reinforced the importance of correct wiring and voltage levels, and deepened understanding of integrating wireless communication modules with microcontroller boards.