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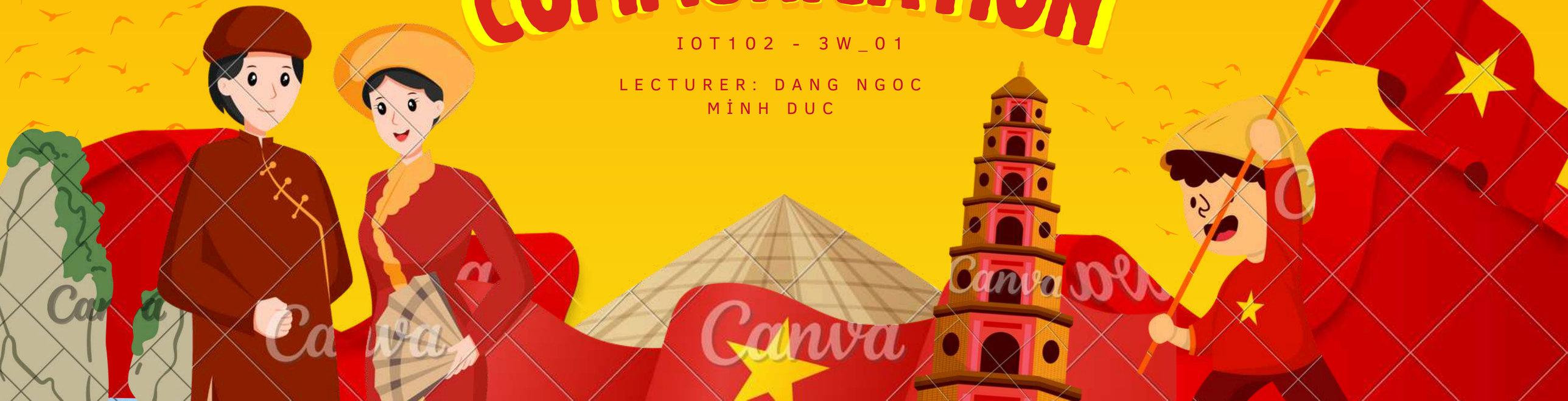
FINAL PROJECT

PRESENTED BY GROUP 8

SMART LED MATRIX DISPLAY WITH BLUETOOTH COMMUNICATION

IOT102 - 3W_01

LECTURER: DANG NGOC MINH DUC



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01 INTRODUCTION

- This project uses an 8X32 LED matrix display to display time, temperature and date or custom messages.
- The system is controlled remotely via Bluetooth, allowing users to update and manage content easily from their smartphones, and can customize the display style such as stationary, vertical/horizontal scrolling, etc.

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02 KEY FEATURES

1. RTC Clock: Shows real-time using the DS1307 clock module.
2. Temperature: Reads the room temperature with the LM35 sensor
3. Bluetooth Communication: Send messages via HC-05
4. Display Effects: Scrolling and Static
5. Data Storage: Saves messages in EEPROM.

03 BLOCK DIAGRAM

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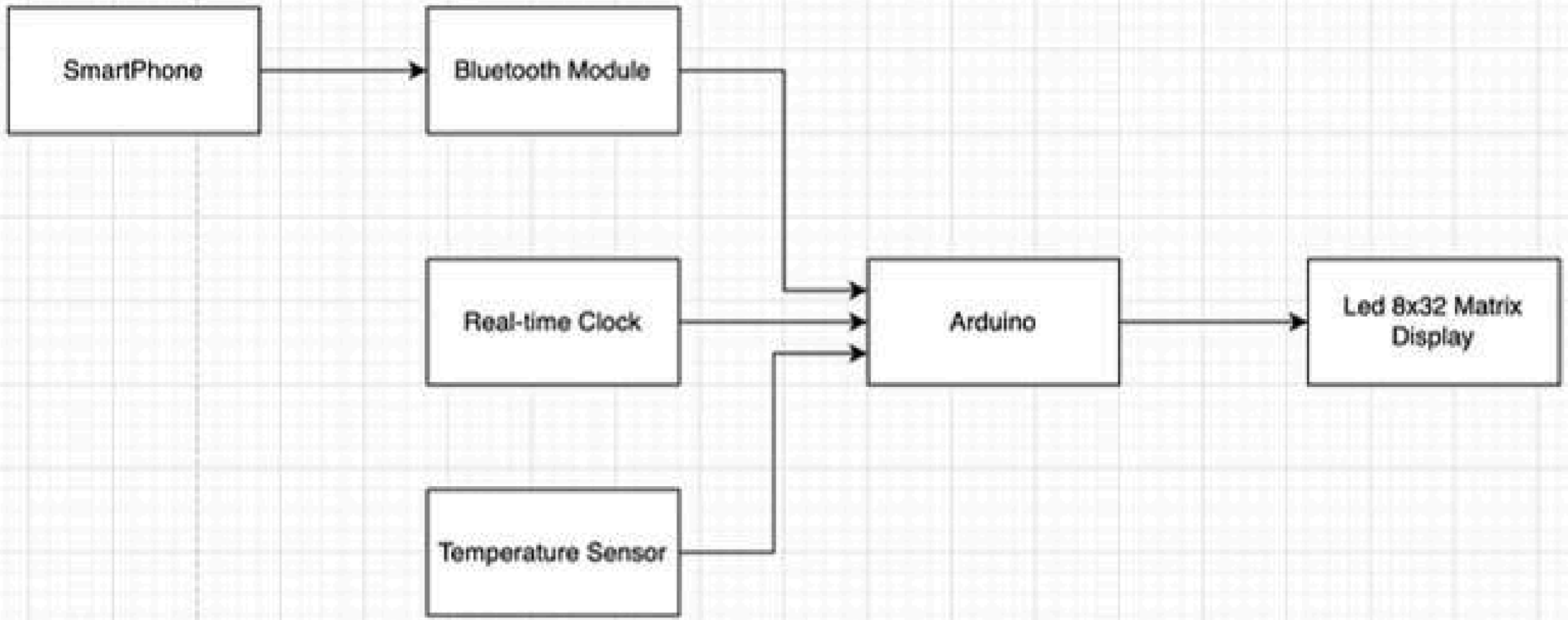
Block Diagram:



04 ELECTRONIC COMPONENTS

DS1307 – Real-time clock (RTC) module for accurate timekeeping.

HC-05 – Bluetooth module for wireless control via smartphone or PC.

LED Matrix Display – Displays time, temperature, and messages with effects.

Microcontroller (Arduino) – Controls the system and processes data.

EEPROM – Stores messages and settings to retain data after power loss.

LM35 – Analog temperature sensor for measuring ambient temperature.

04 ELECTRONIC COMPONENTS

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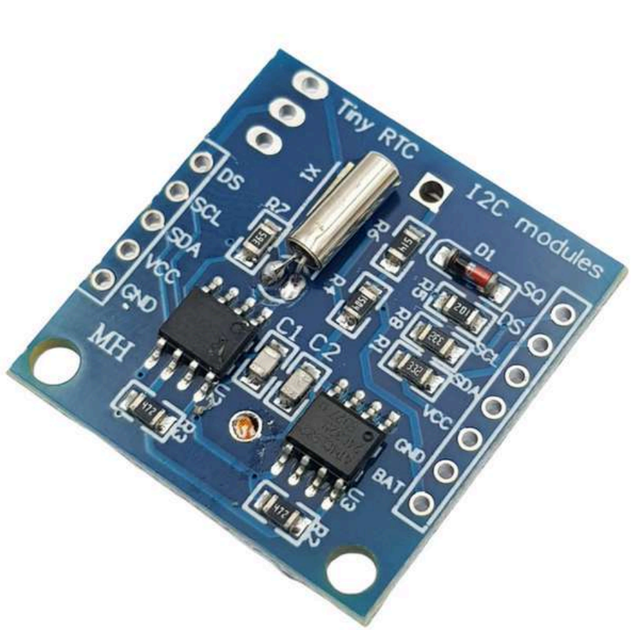

DS1307 – REAL-TIME CLOCK (RTC) MODULE FOR ACCURATE TIMEKEEPING.

04 ELECTRONIC COMPONENTS

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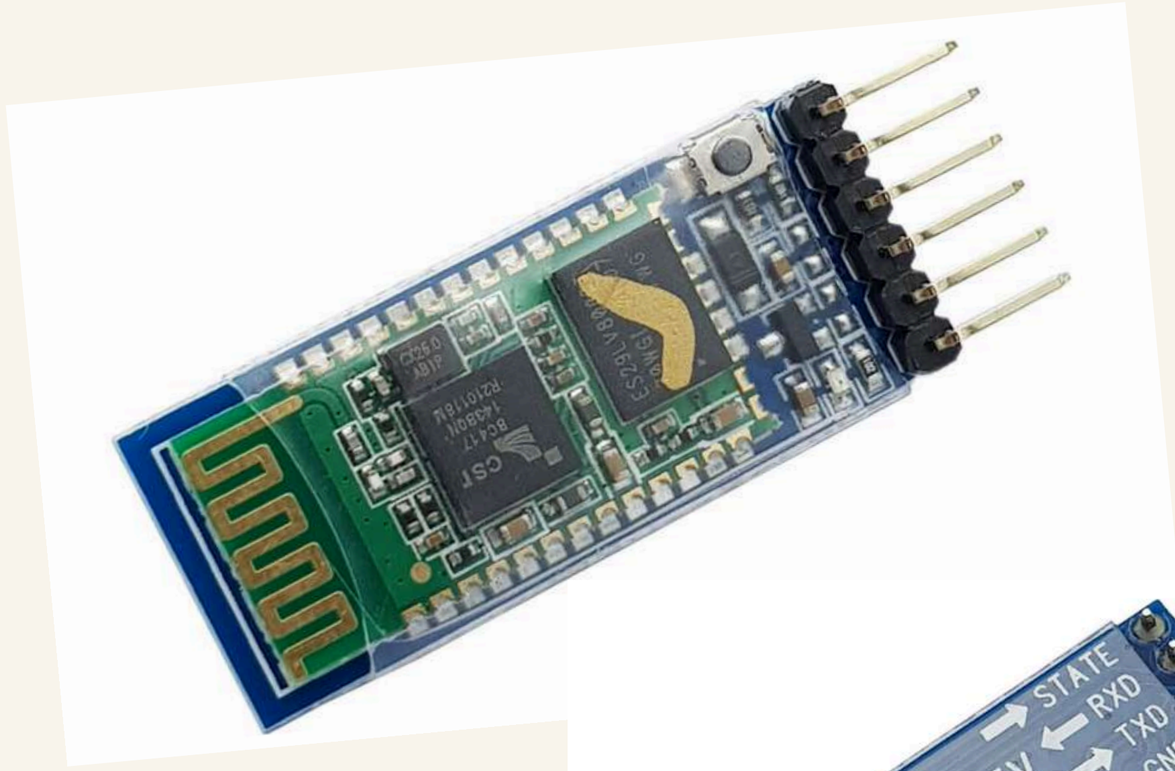
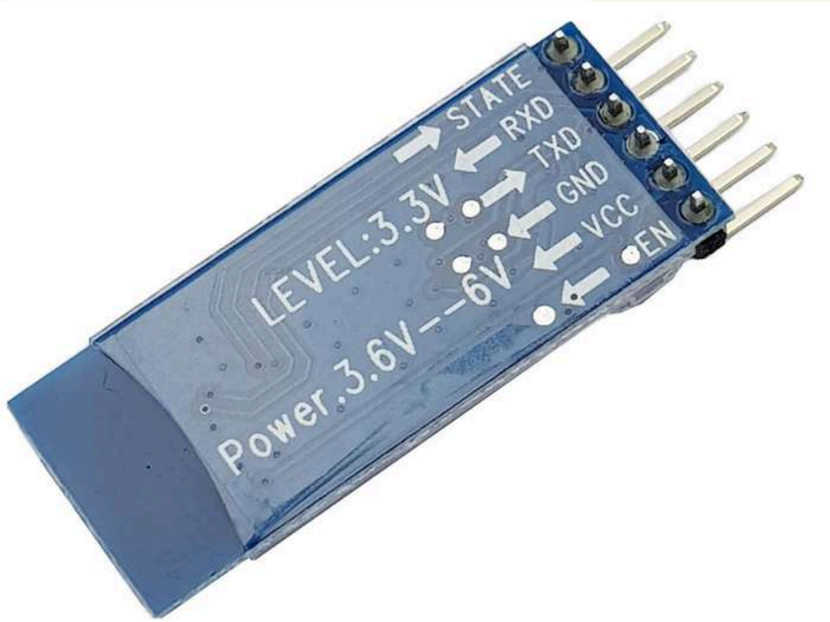
HC-05 – BLUETOOTH MODULE FOR WIRELESS CONTROL VIA SMARTPHONE OR PC.





04 ELECTRONIC COMPONENTS

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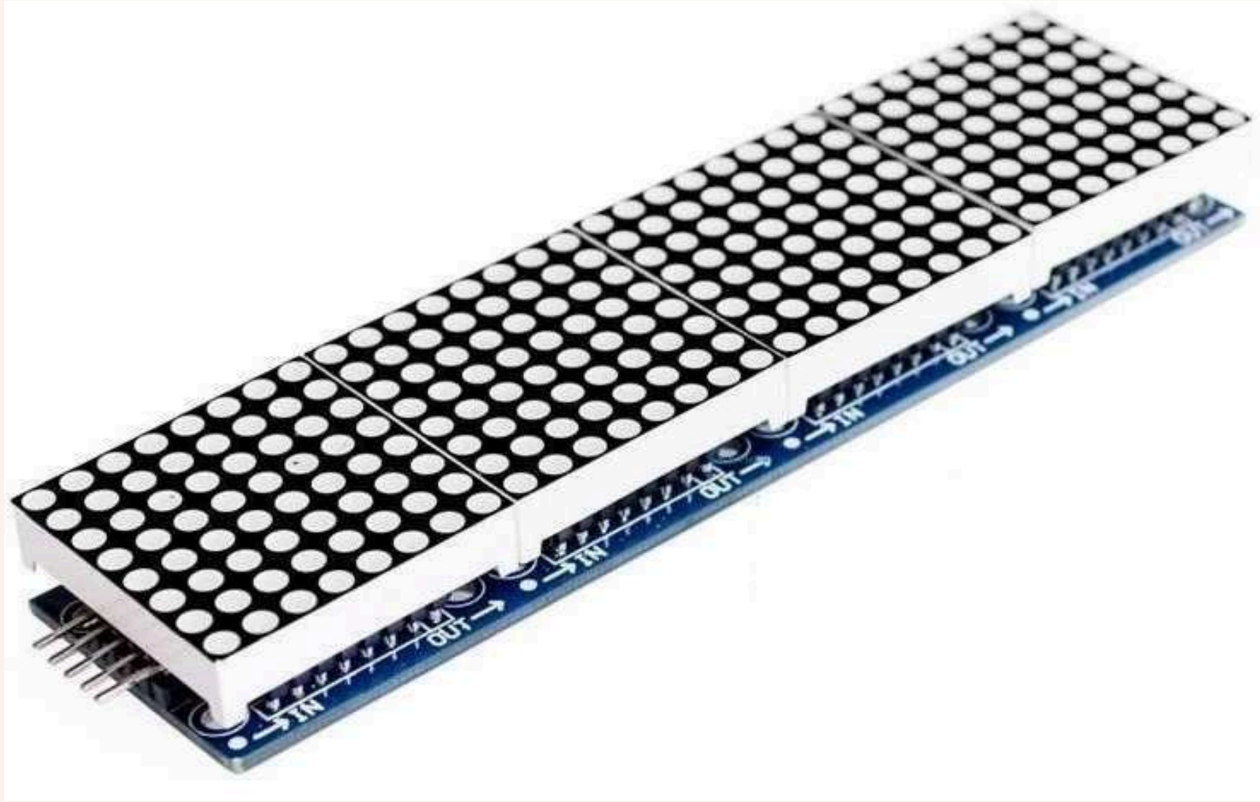
LED 8X32 MATRIX DISPLAY – DISPLAYS TIME, TEMPERATURE AND MESSAGES WITH EFFECTS



04 ELECTRONIC COMPONENTS

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MICROCONTROLLER (ARDUINO) – CONTROLS THE SYSTEM AND PROCESSES DATA.

EEPROM – STORES MESSAGES AND SETTINGS TO RETAIN DATA AFTER POWER LOSS

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04 ELECTRONIC COMPONENTS

LM35 – ANALOG TEMPERATURE SENSOR FOR MEASURING AMBIENT TEMPERATURE.

04 ELECTRONIC COMPONENTS

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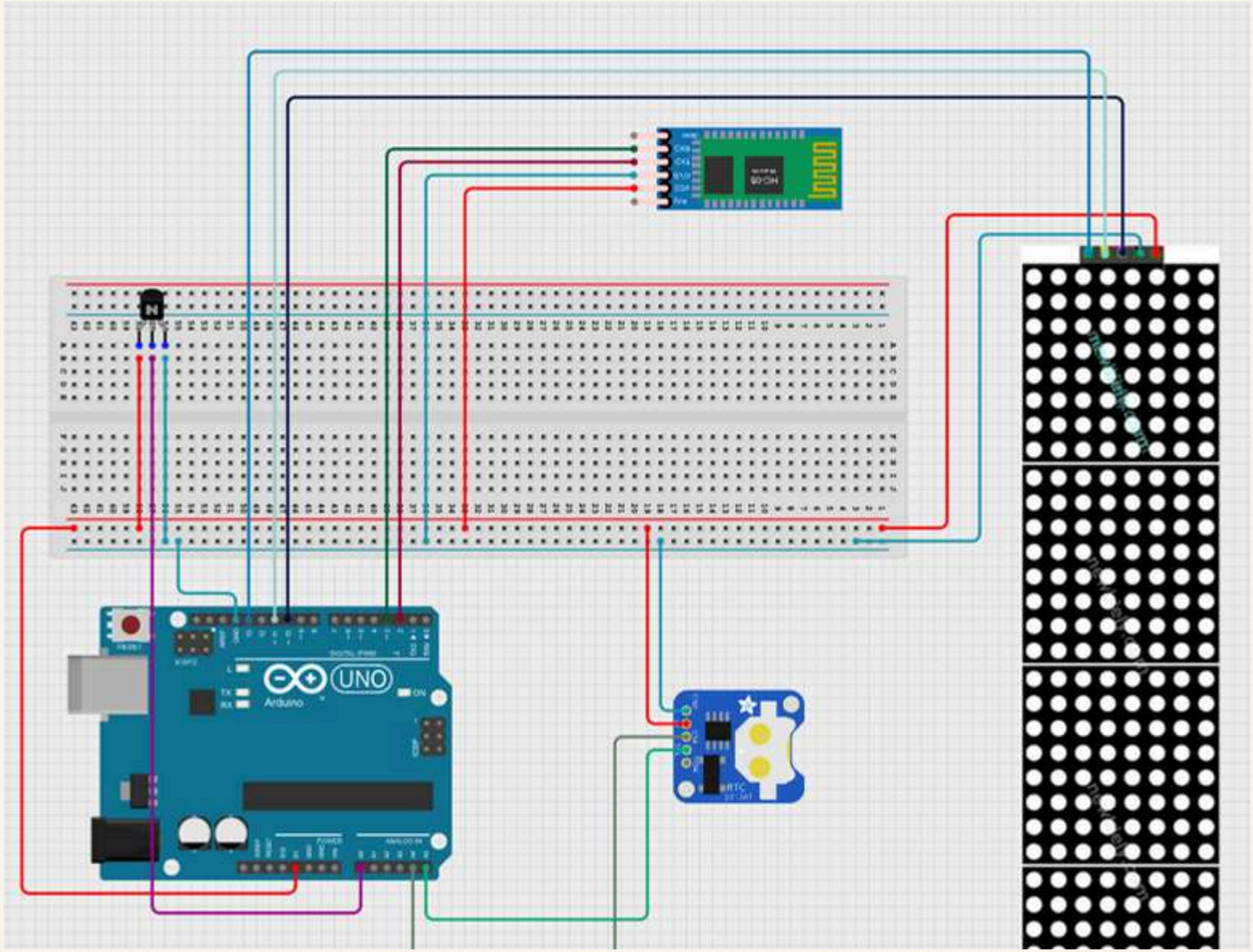
CIRCUIT SCHEMATIC



04 ELECTRONIC COMPONENTS

HARDWARE INTERFACING

Arduino Uno	Bluetooth Module (HC-05)	RTC DS1307	8x32 matrix LED	LM35
GND	GND	GND	GND	GND
5V	VCC	VCC	VCC	VCC
D2	TX			
D3	RX			
A4		SDA		
A5		SCL		
D10			CS	
D11			DIN	
D13			CLK	
A0				OUT

05 PROGRAMMING FLOWCHART

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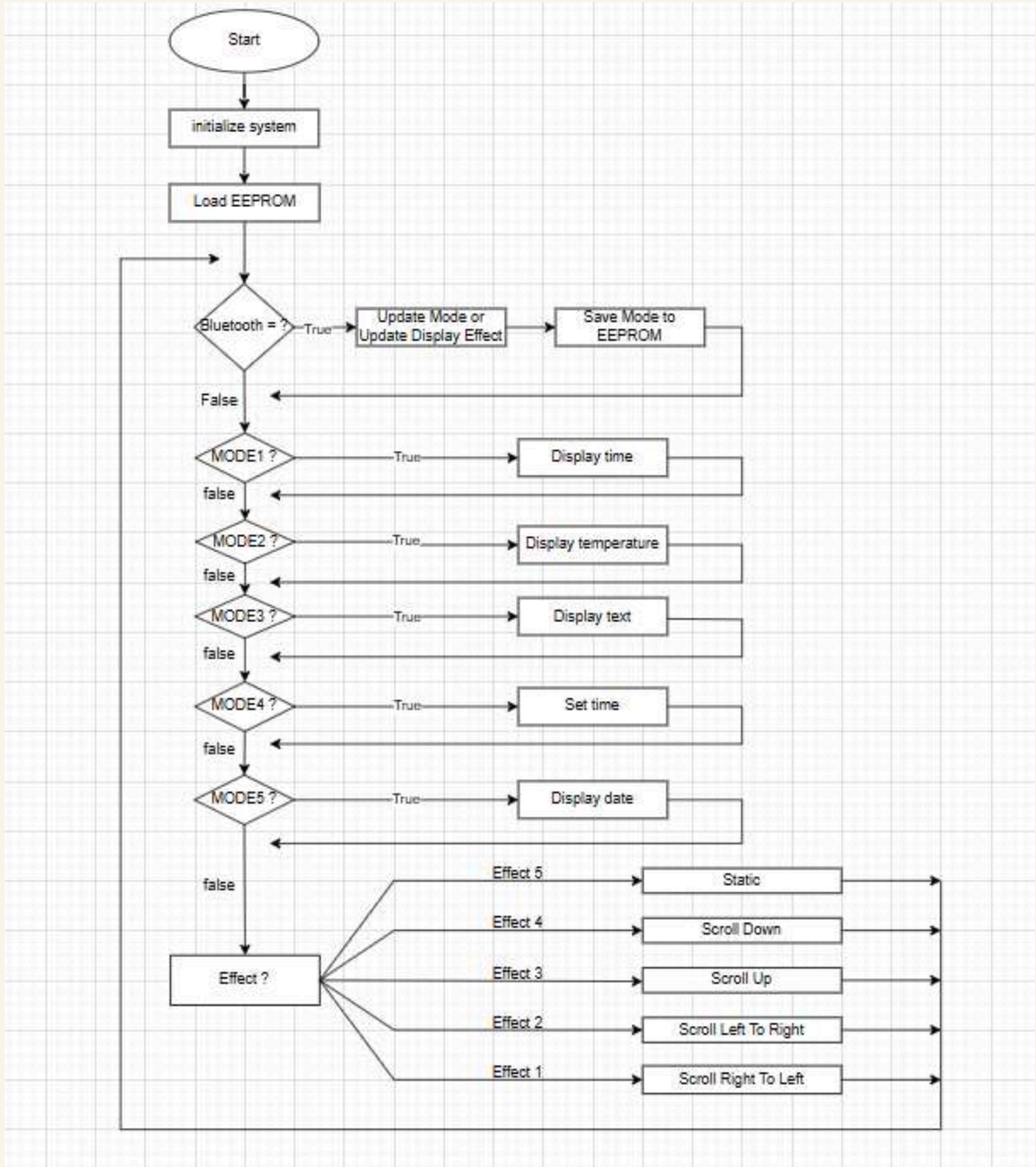
LINK: FLOWCHART.



06 DEMO CLIP

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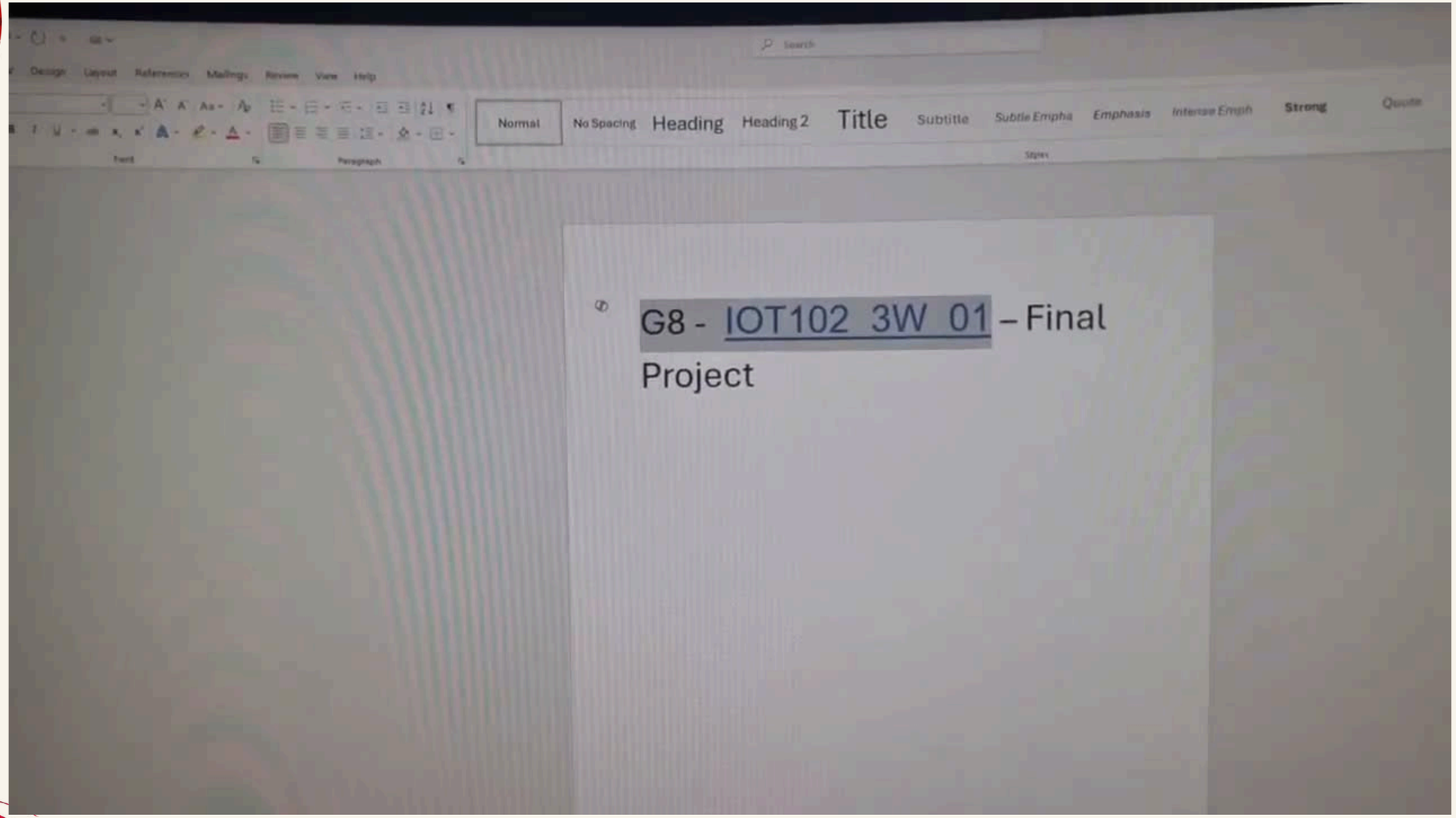

07 FUTURE WORK

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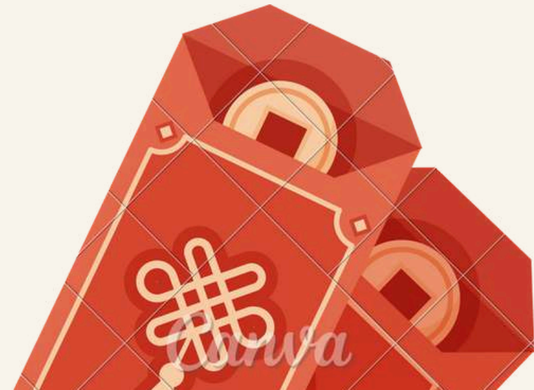
- Expand the LED matrix to display more information at once.
- Adding new sensors like DHT11 (humidity) for real-time humidity sensing
  Piezo to warn if temperature gets too high



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08 CONCLUSIONS

This project enables real-time displays of time, temperature, and custom messages, all controlled remotely via Bluetooth. It supports various display effects and uses EEPROM for reliable data storage, making it a flexible.

09 Q&A

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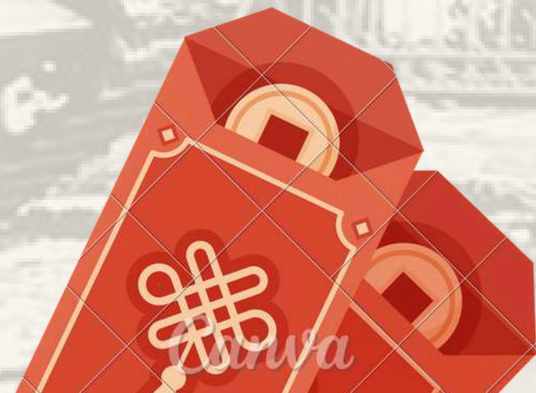
IF YOU HAVE ANY QUESTIONS, PLEASE DON'T HESITATE TO ASK US.



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THANK YOU