

GitHub-Based QA Documentation & Problem Solving based on Electronics/Cross Domain Projects

Embedded System GitHub Activity Report

Title: Temperature Monitor using Arduino

Team Members:

- Kamlesh Pawar
- Suryansh Ambekar
- Mayank Soni

Submitted by:

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Course: Project Management(2307476T)

A. GitHub Repository Link

 https://github.com/Kamleshpawar2704/Embedded_Temperature_Monitor_Arduino

 https://github.com/Kamleshpawar2704/Embedded_LED_Blink_Arduino

This project demonstrates real-time temperature monitoring using an Arduino UNO and an LM35 Temperature Sensor.

It reads analog data from the LM35 sensor, converts it to Celsius, and displays results through the Serial Monitor and LED alerts.

B. Brief Description of Code

This project demonstrates how to **monitor temperature in real-time** using an **LM35 sensor** and an **Arduino UNO**.

The LM35 is an analog temperature sensor that provides a linear voltage output proportional to temperature in Celsius. The Arduino reads this voltage via its analog input, converts it into temperature, and displays the readings on the **Serial Monitor**.

Additional features include LED alerts and visualization via the **Serial Plotter**.

Code Variants

1. **temp_basic.ino** – Reads and displays temperature in °C.
2. **temp_with_led_alert.ino** – Adds LED alerts for temperature thresholds.
3. **temp_with_serial_plot.ino** – Outputs data suitable for Arduino Serial Plotter visualization.

Hardware Components

Component	Quantity	Description
Arduino UNO	1	Main microcontroller
LM35 Sensor	1	Temperature sensor
Red LED	1	High temperature indicator
Green LED	1	Normal temperature indicator
Breadboard	1	Circuit base
Jumper Wires	—	For connections

Pin Connections

LM35 Pin	Arduino Pin	Description
VCC	5V	Power supply
OUT	A0	Analog signal input
GND	GND	Ground connection

C. QA Issues Logged

Issue No.	Title	Description	Status
#1	Temperature fluctuates	Readings unstable due to sensor noise	Open
#2	LED not responding	Incorrect pin mode configuration	Resolved
#3	Serial output delay	Delay too short for smooth serial print	Closed

Resolution Notes:

- Added small capacitor near sensor to stabilize readings.
- Fixed LED pins configuration and tested alerts.
- Adjusted delay to 1000ms for consistent serial output.

D. Collaboration Summary

Team Members:

- Kamlesh Pawar (Developer)
- Suryansh Ambekar (Tester)
- Mayank Soni (Reviewer)

Summary of Contributions:

1. **Kamlesh Pawar:** Implemented main Arduino code and documentation.
2. **Suryansh Ambekar:** Logged and tracked QA issues for LED alerts.
3. **Mayank Soni:** Suggested delay optimization and verified results.

All members collaborated through GitHub Issues, comments, and commit messages to ensure transparency and teamwork.

E. Learning Outcome

- Interfaced LM35 Temperature Sensor with Arduino.
- Gained experience in analog-to-digital conversion (ADC) and calibration.
- Learned to implement real-time monitoring using Arduino Serial Plotter.
- Understood GitHub features like Issues, Pull Requests, and Commit History.
- Enhanced project presentation and reporting skills for embedded systems.

F. Conclusion

This activity successfully demonstrated the use of Arduino for real-time environmental monitoring. It combined hardware interfacing, signal processing, and version control documentation into one cohesive embedded project.

The GitHub-based QA tracking improved the project's reliability and professional workflow, reflecting real-world embedded system development practices.