

## Smart Home Automation System

**Role:** Embedded Systems Engineer & Team Leader

**Team:** Led a team of 5 engineers working collaboratively on the project.

### Project Overview:

This project was undertaken as part of my Embedded Systems Diploma program at the Information Technology Institute (ITI). I led a team to create a functional smart home automation system with user-friendly controls and advanced features.

### My Contributions:

- **Leadership:** Led the team in all stages, defining project goals, dividing tasks, and ensuring project deadlines were met. Provided technical guidance to team members.
- **Hardware and Software Integration:** Selected, assembled, and programmed hardware components, including microcontrollers (ATmega32), LEDs, temperature sensors, LCD displays, keypads, and the ADC module.
- **Microcontroller Programming:** Programmed ATmega32 microcontrollers (Master & Slave) using AVR-GCC and Eclipse IDE. Implemented the SPI communication protocol.
- **User Interface Development:** Designed the user interface, creating intuitive menus and navigation using LCD displays and keypads. Implemented user roles (GUEST & ADMIN) with password authentication.
- **Code Development:** Developed drivers for components like the ADC, LEDs, SPI, and timers. Wrote core logic for temperature control, lighting management, and user authentication.
- **Simulation and Testing:** Used Proteus to simulate and test circuits and functionalities.
- **Documentation and Collaboration:** Documented the project and facilitated effective communication and collaboration within the team.

### Key Technical Skills Demonstrated:

- **Embedded Systems Programming:** Proficient in C programming for AVR microcontrollers.
- **Hardware Integration:** Extensive experience in connecting and configuring various hardware components.
- **Communication Protocols:** Expertise in SPI communication.
- **User Interface Design:** Ability to create user-friendly interfaces using LCD displays and keypads.
- **Simulation and Testing:** Proficient in using simulation tools (Proteus).
- **Team Leadership:** Proven ability to lead and motivate teams, delegate tasks effectively, and ensure project success.
- **Technical Communication:** Strong communication and documentation skills.

## Impact of the Project:

This project showcased my leadership and technical expertise in embedded systems development. It provided valuable practical experience in managing a team, coordinating efforts, and delivering a complex and functional system.

## Portfolio:

- I can provide you with the complete source code, circuit diagrams, and documentation for the smart home project upon request.
- I also have experience with other embedded systems projects, which I can discuss further.

## How this experience relates to the remote work program:

This project demonstrates my ability to work collaboratively and effectively on complex projects, even remotely. My experience with team leadership, independent work, time management, and clear communication makes me well-suited for a remote work environment.

## illustrative picture

