# **IoT-Based Gas Leakage Detection System**

**January 2024 – March 2024**  
 **Role: Developer & System Integrator**

**Problem Statement:**

Gas leaks pose a critical threat to both residential and industrial environments. Traditional gas detection methods are manual, delayed, and often hazardous. This project leverages IoT technologies to provide real-time alerts, enabling proactive action and preventing disasters.

# **Project Highlights:**

Key features:

* MQ2/MQ135 Sensors: Detect presence of combustible and toxic gases.
* NodeMCU ESP8266: Wireless microcontroller for cloud connectivity.
* GSM Module (SIM800L): Sends SMS alerts and live updates during critical leaks.
* Mobile Notifications: Remote users receive real-time alerts.
* Buzzer & LED System: On-site audible and visual alarms for immediate awareness.

**My Contributions:**

* Integrated MQ2 & MQ135 gas sensors with NodeMCU.
* Developed Arduino-based logic to monitor gas thresholds and trigger alerts.
* Configured GSM SIM800L module to reliably send SMS alerts.
* Designed and soldered a compact, stable hardware layout.
* Calibrated sensor accuracy for indoor gas detection scenarios.

**Technologies Used:**

**MQ2 Sensor | MQ135 Sensor | NodeMCU ESP8266**

**GSM SIM800L | Arduino IDE | Buzzer | LED | IoT**

**Challenges & Learnings:**

* Fine-tuned sensor calibration to minimize false positives.
* Optimized signal strength handling for SMS delivery in low-coverage areas.
* Understood hardware-software integration with real-time responsiveness.

**Outcome:**

A compact and responsive IoT gas detection system capable of providing instant alerts locally and remotely, enhancing safety in vulnerable environments.