**Gas Leakage Detection System using IoT**

The Gas Leakage Detection System using IoT is a smart embedded solution designed to detect harmful gases such as LPG, Methane, or Carbon Monoxide and alert users in real-time. This system leverages sensors, a microcontroller, and network connectivity to provide fast and reliable alerts via a buzzer, LED indicators, and/or mobile notifications.

**Components Used :**

- ESP8266 NodeMCU (IoT-enabled microcontroller)

- MQ-2 or MQ-5 Gas Sensor (for detecting gases)

- Buzzer (for audio alert)

- LED (for visual alert)

- Power Supply (Battery or USB)

- Wi-Fi Network (for IoT connectivity)

**Working Principle :**

1. The gas sensor constantly monitors the environment in industries, homes, or other areas.

2. When gas leakage is detected, the sensor outputs a signal to the ESP8266 controller.

3. The ESP8266 reads this signal and performs the following actions:

- Switches on the water sprinkler.

- Activates the buzzer and LED for local alerts.

- Sends data to an IoT platform for remote monitoring (e.g., mobile, laptop).

4. Users can receive alerts on their smartphones or dashboards, enabling quick actions like switching off lights and taking other precautionary measures to avoid fire hazards.

**Applications :**

- Home kitchens and gas stoves

- Industrial gas storage and supply units

- Hotels, restaurants, and laboratories

- Public transport and vehicle garages

This IoT-based gas leakage detection system ensures safety and preventive monitoring in areas prone to gas hazards. With easy scalability and real-time alerts, it is a reliable tool in smart safety systems.