Title: IOT Based Fire Department Alerting System

Aim

The aim of this project is to build an IoT-based system that can **automatically detect a fire incident** and **instantly alert the fire department** through the internet, allowing faster response and saving lives and property.

Objective

- To detect fire automatically using multiple sensors.
- To send real-time alerts to the fire department using IoT.
- To reduce the time delay in manual fire reporting.
- To increase the chances of timely evacuation and rescue.

Working

This system uses a **fire sensor** to detect flames and a **PIR sensor** to detect human presence. If both sensors detect abnormal readings, the system uses a **temperature sensor** to reconfirm the fire outbreak. Once confirmed, the **Arduino Uno** processes the data and sends the alert to a web-based IoT platform using a **Wi-Fi module**. The platform (IOTGecko) receives the alert and displays the location (based on device ID or flat/area name) on the interface. At the same time, an alarm buzzer is triggered in the fire department's system to alert personnel for immediate action.

Hardware Components Used

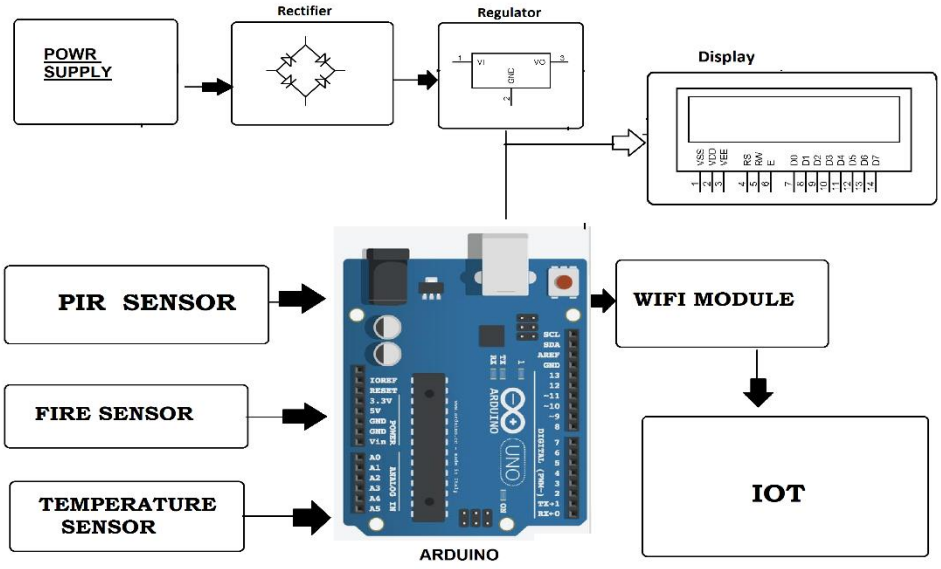
- **Arduino Uno** – Main microcontroller for data processing
- **Fire Sensor** – To detect fire or flame
- **PIR Sensor** – To detect motion or human presence
- **Temperature Sensor** – To confirm the fire outbreak
- **Wi-Fi Module** – For sending data to IoT platform
- **LCD Display** – To display sensor status and alerts

- **Alarm Buzzer** – To provide sound alert
- **Rectifier & Voltage Regulator** – For stable power supply
- **Power Supply Components** – Adapter, transformer, etc.
- **Wires, PCB, and Connectors** – For building circuit

Software Used

- **Arduino IDE** – To write and upload code to Arduino
- **Programming Language:** C
- **IoT Platform:** IOTGecko – For web-based alert monitoring

Block Diagram :



Advantages

- Fully automatic fire detection and alert system
- Sends real-time alerts to fire department

- Can be accessed remotely from anywhere
- Low-cost and easy to maintain
- Helps in reducing loss of life and property

Disadvantages

- Requires continuous internet connection
- May give false alerts if sensors are not calibrated properly
- Hardware damage can affect performance
- Limited range if Wi-Fi signal is weak

Applications

- Residential apartments and buildings
- Commercial complexes and malls
- Schools, colleges, and offices
- Hospitals and old age homes
- Industrial warehouses and factories

Future Scope

- Integration with GPS for precise location tracking
- Adding camera module for live fire footage
- Using GSM module for SMS alert in no-internet zones
- Connecting system to city's central fire command
- App notification system for residents

Conclusion

The **IoT Based Fire Department Alerting System** is a smart and efficient way to **detect and report fire incidents** in real-time. By automating the alert process and using online platforms, this system ensures a faster response from fire personnel, minimizing the loss of life and damage to property. It is highly suitable for modern urban safety systems.