# Web-Based Temperature Alert System

Name: Obua Janan Jandy

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## Introduction

The Web-Based Temperature Alert System is an IoT-based health monitoring project designed to measure and monitor temperature levels remotely using an ESP32 microcontroller. The system focuses on real-time temperature monitoring, alert generation, and online accessibility of data through a local web server. This project targets scenarios where constant temperature observation is essential, such as monitoring patients' body temperature in health facilities or individuals at home.

## Background

Monitoring temperature is a key aspect of preventive healthcare and timely intervention. High body temperature is often an indicator of infections or other medical conditions that require immediate attention. Traditional thermometers provide readings at a specific moment, but they lack continuous monitoring and remote accessibility. With IoT technology, it is possible to measure and display temperature data in real time, and alert the concerned person automatically when it exceeds a set threshold.

## System Components

The system consists of the following main components:

1. ESP32 Microcontroller - The core processing unit that reads temperature data and hosts the web server.
2. DS18B20 Temperature Sensor - A waterproof and highly accurate digital sensor for temperature measurement.
3. Buzzer - Provides an audible alert when temperature exceeds the set limit.
4. LED Indicator - Offers a visual signal for high-temperature alerts.
5. USB Power Supply - Powers the ESP32 and other components.

## System Operation

The DS18B20 sensor continuously measures the temperature and sends the data to the ESP32. The ESP32 processes this information and hosts a web page accessible over Wi-Fi, displaying the real-time temperature reading. If the temperature rises above the preset threshold (e.g., 37.5°C), the

system triggers both the LED and buzzer to alert nearby individuals. The web page background also changes color to indicate the alert state, allowing remote users to immediately identify abnormal readings.

## Advantages

- Real-Time Monitoring: Enables constant observation of temperature.
- Remote Accessibility: Users can check temperature data from any device connected to the same network.
- Immediate Alerts: Both visual and audible notifications for prompt action.
- Simple Power Source: Operates entirely from a USB supply without extra batteries.

## Applications

- Patient temperature monitoring in clinics and hospitals.
- Home healthcare for elderly or sick individuals.
- Remote monitoring in quarantine situations.

## Conclusion

The Web-Based Temperature Alert System provides a simple yet effective method for continuous health monitoring. By combining the ESP32's Wi-Fi capabilities with a DS18B20 temperature sensor, the project delivers accurate, real-time data and ensures immediate notification in case of abnormal readings. This system can significantly improve response time in medical situations, making it a valuable tool in both personal and professional healthcare environments.