Wireless Sensor Network-Based Smart Healthcare Monitoring System

Isha Jangir (202211031)
Rajat Kumar Thakur (202211070)

Project Overview:
This project focuses on designing and implementing a Wireless Sensor Network (WSN) for Smart Healthcare. The system will use wearable sensors, and environmental sensors to monitor patients' health, track movement, and ensure safety in smart homes or hospitals. Data from sensors will be transmitted wirelessly to a central monitoring system for real-time analysis and alert generation.

Project Objectives:
1. Deploy a Wireless Sensor Network (WSN) for continuous health monitoring.
2. Monitor physiological parameters using wearable sensors.
3. Develop a data transmission system using Bluetooth, or Wi-Fi.
4. Provide real-time alerts based on sensor readings.

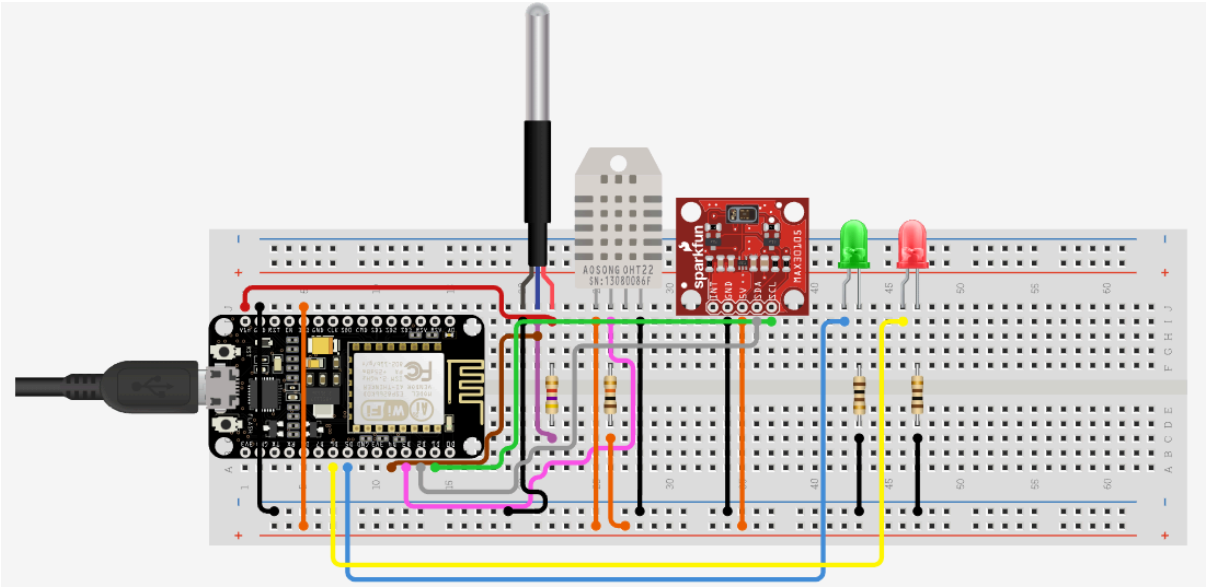
Sensors in this project:
Temperature sensor (e.g., DS18B20)
SpO2 sensor (e.g. MAX30100)
Temperature & Humidity Sensor (e.g. DHT22)

Wireless Communication System:
1. Bluetooth: Connectivity to mobile devices.
2. Wi-Fi: For real-time data transmission to a central system.

Data Collection & Processing:
1. Microcontroller (e.g., Node MCU): Collects and processes sensor data.
2. Local Storage or Cloud: Data logging for health records.
3. Web/App Interface: Displaying real-time sensor readings.

Expected Outcomes:
1. Real-time patient health monitoring using WSN.
2. Remote tracking of elderly or patients in hospitals.
3. Improved emergency response with sensor-based alerts.
4. Energy-efficient and scalable healthcare solution.

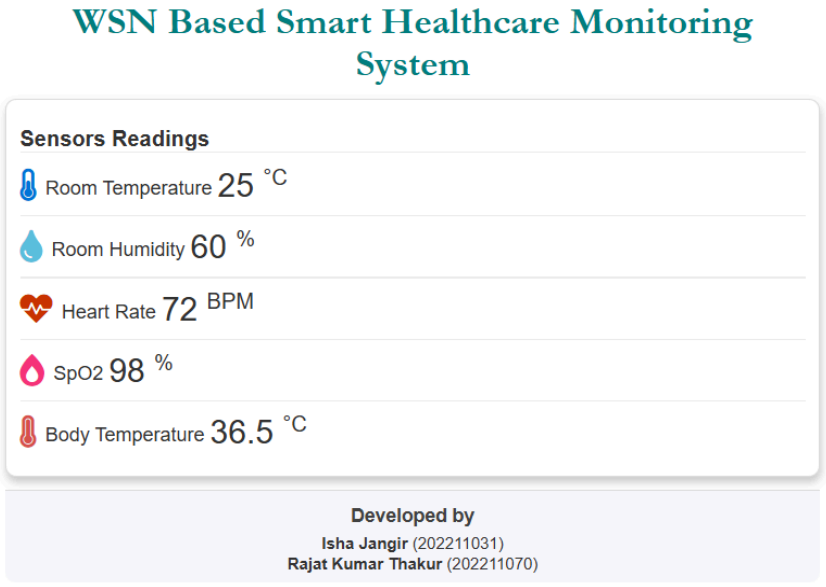
References:
Wireless Sensor Networks for Smart Healthcare.pdf
A_Comprehensive_Review_on_Wireless_Healthcare_Monitoring_System_Co…
Smart Healthcare Monitoring System Based on.pdf



Proposed Circuit Diagram (online simulator)

S. No.	Component Name	Link	Quantity
1.	Temperature sensor (e.g., DS18B20)	link	1
2.	SpO2 sensor (e.g. MAX30100)	link	1
3.	Temperature & Humidity Sensor (e.g. DHT22)	link	1

Initial Responsive Web Page for data monitoring:



Github Repo : Smart-Healthcare-Monitoring-System

Project Updates:

Work progress for the WSN project (version 2):

- **Circuit Diagram Implementation:**
  - Designed and implemented the circuit diagram using an online simulator.
  - Verified that the circuit integrates all necessary components (sensors and microcontroller).

- **Web Page Development:**
  - Developed a responsive web page for real-time data display.
  - Coded all the necessary front-end elements to monitor and visualize sensor data.

- **Completed Work:**
  - Circuit diagram finalized in the simulator.
  - Web interface built and running for initial data monitoring.

- **Tasks Remaining:**
  - Develop and code the firmware for the Node MCU.
  - Connect the Node MCU to the web server, enabling seamless data transmission.
  - Integrate sensor data acquisition from the Node MCU with the web display.