**System Overview**

This IoT smart room system allows users to turn ON/OFF their TV and fan remotely using a web-based interface. The NodeMCU (ESP8266) is used as the main controller, while the 2-channel relay module acts as a switch to control both devices.

Required Components

1. NodeMCU (ESP8266) – Acts as the main microcontroller and Wi-Fi module.

2. 9V Battery – Provides power to the circuit.

3. 7805 Voltage Regulator – Converts 9V to 5V for NodeMCU and relay module.

4. 2-Channel Relay Module – Controls TV and fan.

5. Jumper Wires – For connections.

**Circuit Connection**

• 9V Battery → 7805 → NodeMCU & Relay Module

o 9V Battery positive to Vin of 7805.

o 7805 Output (5V) to VCC of NodeMCU and relay module.

o Ground (GND) common to all components.

• NodeMCU to Relay Module

o D1 (GPIO5) → Relay 1 IN (TV)

o D2 (GPIO4) → Relay 2 IN (Fan)

o GND → Relay Module GND

o 5V → Relay Module VCC

• Relay Output Connections

o Relay 1 (NO, COM) → TV power connection.

o Relay 2 (NO, COM) → Fan power connection.

**How It Works**

1. Power ON the system using the 9V battery.

2. NodeMCU connects to Wi-Fi using credentials.

3. A web server is created to control TV and fan.

4. Users access the webpage on a browser (using the NodeMCU's IP address).

5. Clicking "Turn TV ON" or "Turn Fan ON" activates the relays, switching the respective devices ON.

6. Clicking "Turn TV OFF" or "Turn Fan OFF" deactivates the relays.

**Enhancements**

• Voice Control: Integrate with Alexa/Google Assistant using IFTTT.

• Scheduling: Add timers to turn off devices automatically.

• Mobile App: Develop an Android app instead of a webpage.

1. Controlling TV & Fan via a Website (Web-Based Control Panel)

We will set up a NodeMCU web server, allowing users to control the TV and fan through a webpage accessible from any device (phone/laptop).

**🛠 Required Components**

NodeMCU (ESP8266)

9V Battery + 7805 Voltage Regulator

2-Channel Relay Module

TV & Fan (as appliances)

Wi-Fi Connection