

SMART HOME AUTOMATION

1. **NODEMCU ESP32:** Acts as the central controller and Wi-Fi chip. It's chosen for its affordability, ease of use, and ability to connect various sensors and appliances.
2. **DHT11 Temperature and Humidity Sensor:** Used for sensing temperature and humidity values. The inclusion of humidity sensing helps in detecting conditions like fire outbreaks.
3. **Google Assistant with IFTTT:** Enables voice command functionality for the system. Google Assistant takes voice input from the user, and IFTTT triggers appropriate actions based on the input.
4. **5V 4-channel Relay Module:** Allows control of appliances with large currents. It's used to interface with various household appliances for remote control.
5. **Android Application:** Developed using Android Studio, the app serves as the user interface for interacting with the smart home system. It provides control over lights, temperature/humidity monitoring, and alerts for gas leaks or fire outbreaks.
6. **Firestore Database:** Facilitates communication between the hardware components and the Android application. It stores data such as temperature, humidity, and alerts, allowing the app to retrieve and display real-time information.
7. **Functionality:**
 - **Lights Control:** Users can control individual room lights or all lights simultaneously. An "Away" mode automatically adjusts lighting and other appliances at predefined times.
 - **Temperature and Humidity Monitoring:** Users can check the status of temperature and humidity in the house through the app.
 - **Gas Leak Alert:** The system detects sudden increases in voltage from the MQ5 sensor, indicating a potential gas leak, and notifies the user.
 - **Voice Control:** Users can use Google Assistant commands to control switches via Blynk.
8. **Advantages of Smart Home:**
 - Reduces physical effort, especially for the elderly or disabled.
 - Saves time by allowing remote operation.
 - Saves energy by managing appliance usage more effectively.
 - Decreases workload, particularly for professionals.
 - Overall, the system provides convenience, safety, and energy efficiency benefits for users.