

# Smart Home Automation Using Ai

## Abstract:

This project presents a **Smart Home Automation System** that enables seamless control of household devices through both **voice commands** and a **manual dashboard interface**. Designed for enhanced convenience, energy efficiency, and security, the system allows users to monitor and control devices like lights, fans, AC, doors, music systems, and televisions from a centralized web application.

The web interface is built using **HTML5**, **CSS3**, and **JavaScript**, offering an intuitive and responsive user experience. The backend is developed with **Python** using the **Flask** micro web framework, enabling efficient routing, state management, and device control. Voice recognition capabilities are integrated using the **Web Speech API**, allowing real-time command execution without physical interaction. The manual control interface is implemented with dynamic rendering using **Jinja2 templating**, which updates device status based on backend data.

The dashboard provides visual feedback through status indicators and animated device icons, which are dynamically updated using the current device state stored on the server. Device control logic is simulated for demonstration .

---

## Technologies and Tools Used:

- **Frontend:**
  - HTML5, CSS3
  - JavaScript
  - Jinja2 Templates
  - Web Speech API (Voice Commands)
- **Backend:**
  - Python
  - Flask Framework
- **Design & Visualization:**
  - Responsive UI with CSS Grid/Flexbox
  - Device icons and animations (PNG/GIF)