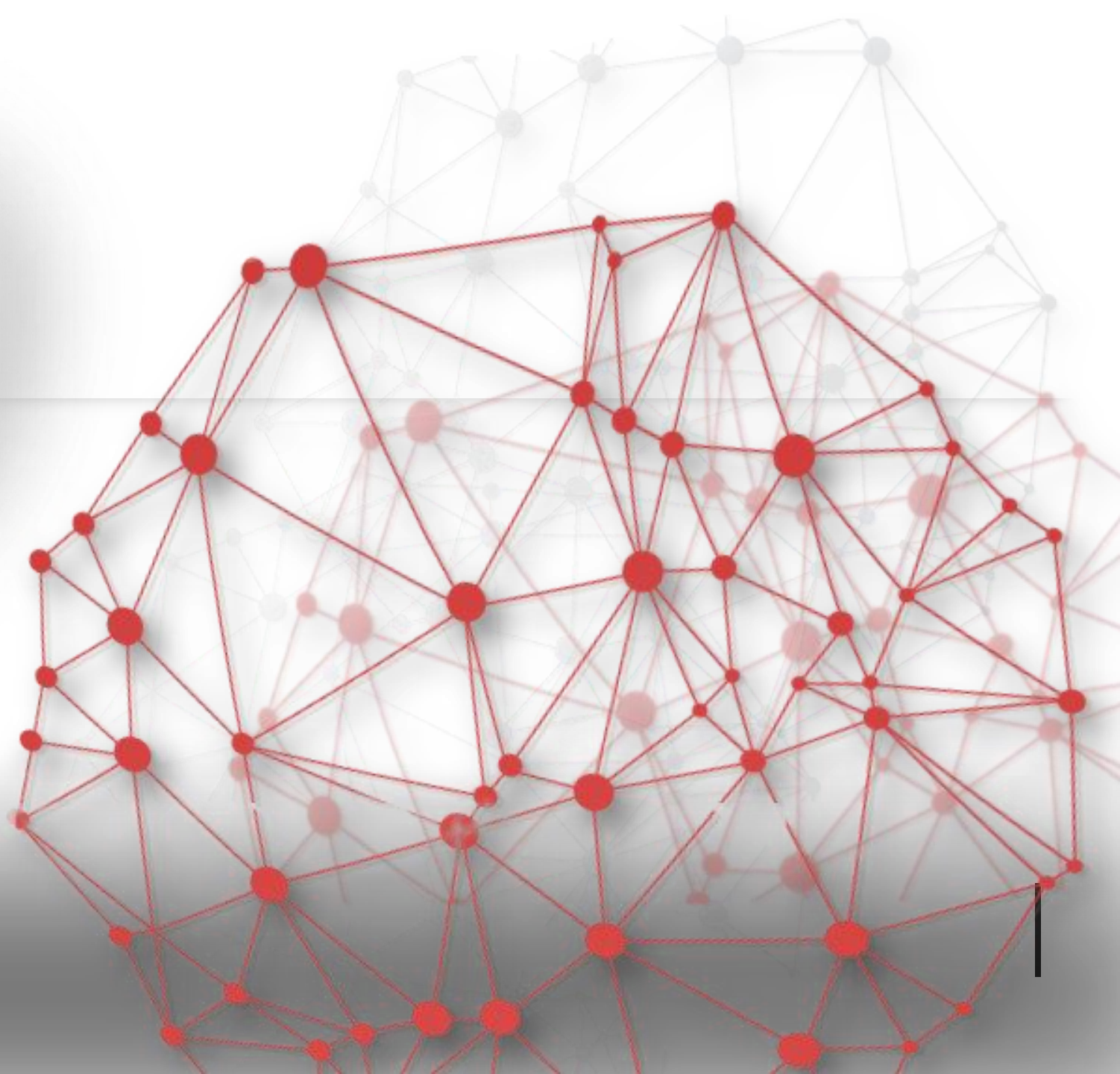


Smart Home



Team Members:

- ⑩ Omar Nagy ELghonamy .
- ⑩ Ahmed Mohamed Ebrahim .
- ⑩ Omar Waly .





Introduction

Smart home systems represent a burgeoning area of technology today, offering convenience and control over household environments. This project focuses on developing a **smart home automation application** designed to transform everyday objects into intelligent, easily controllable devices.

Objective

The primary goal is to create a system that seamlessly combines manual and remote control, increasing efficiency and comfort while maintaining high security standards. This project will:

- Allow control of devices like lamps, doors, and air conditioning via mobile or laptop.

- Provide an emergency interface using an LCD and keypad.

- Incorporate robust security via multiple user types with varying permissions.

- Improve energy usage via temperature-responsive controls.

Project Features

To implement the project, the following functionalities will be developed:

Remote and Local Control

- **Remote Access:**

Devices accessible via mobile phones or laptops.

- **Emergency Local Control:**

LCD and keypad allow user-level operations when remote devices are unavailable.

Controllable Components

- **Lighting Control:**

Six lamps—five with simple on/off functionality and one with adjustable brightness via a dimmer.

- **Door Management:**

Controlled through a servo motor, restricted to admin-only access.

Air Conditioning:

Managed based on ambient temperature using temperature sensors.

Multi-Level Login System**Admin Mode:**

Can register and remove users remotely.

User Mode:

Limited operational access, excluding door controls.

Security Features

All usernames and passwords are stored securely in memory, surviving power off.

System lockdown and fire alarm activation after three consecutive incorrect login attempts.

Admin has override authority during concurrent operations.

Detailed Specifications

LCD and Keypad

1. Allow users to log in to the system.
2. Exclude door control from user access.
3. Display device status during idle periods.
4. Ensure unique usernames separate from remote systems.

EEPROM

1. Store user data during registration.
2. Enable read/write operations in admin mode.
3. Permit read-only access for users.

Lamps, Relay, and Dimmer

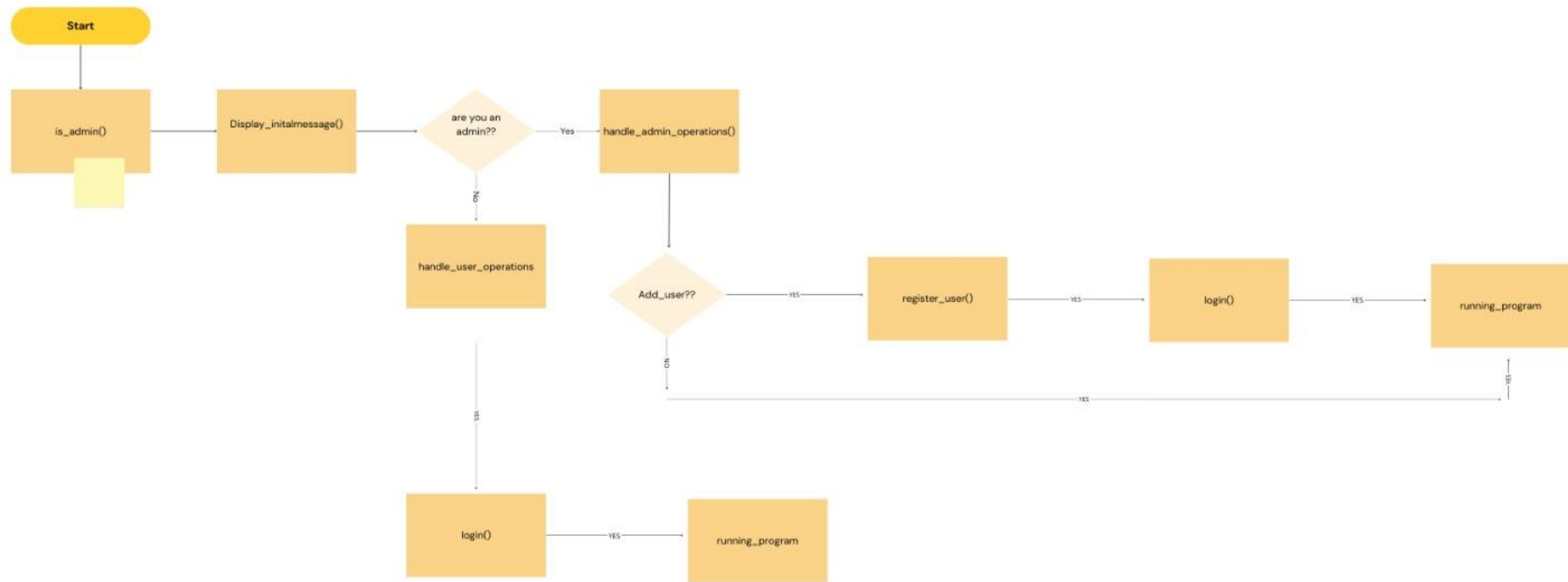
1. Isolate all lamps to handle high-power operation safely.
2. Use a dimmer circuit to modulate brightness based on input voltage (0–5V).

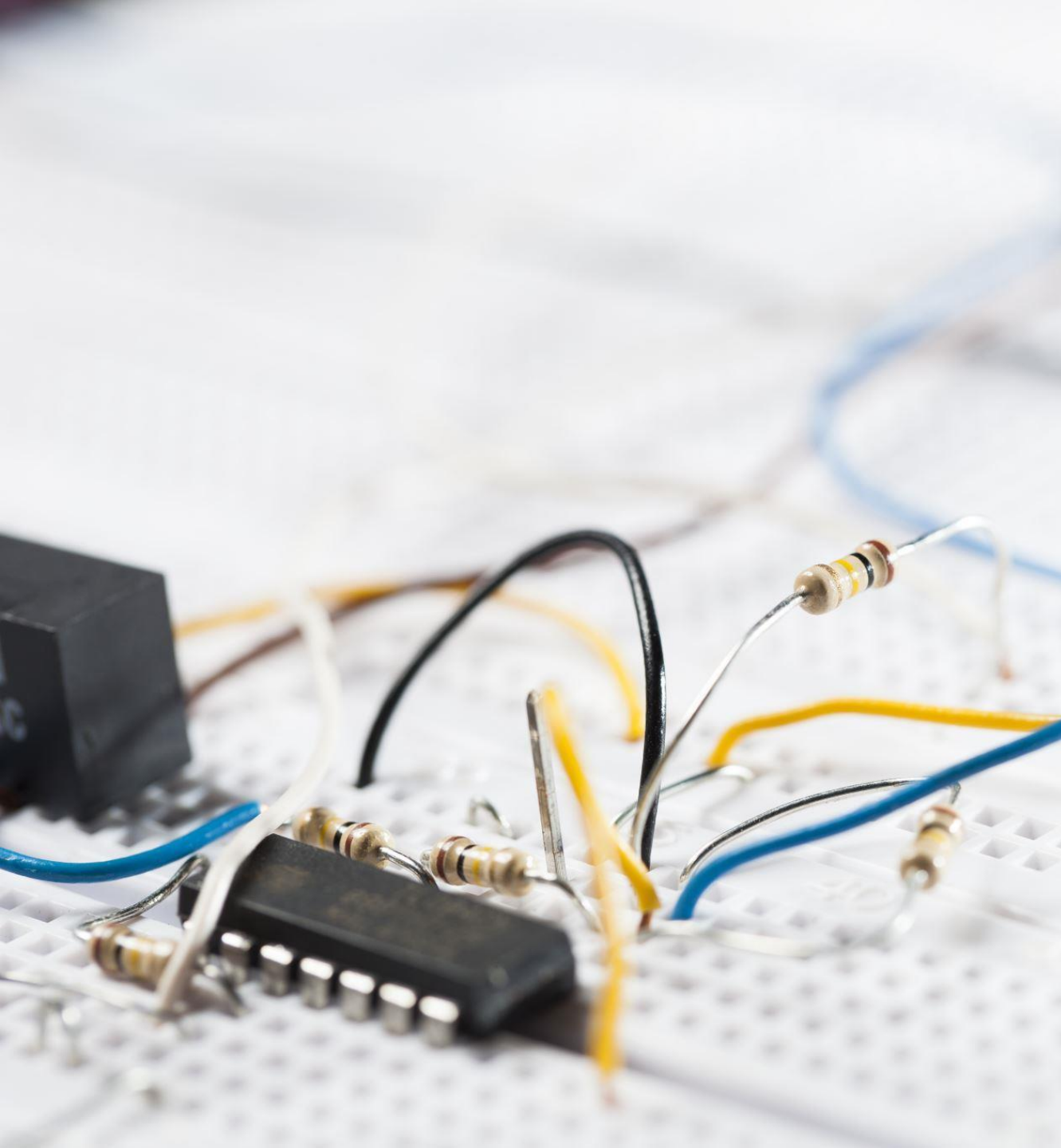
Temperature Sensor and DC Motor

1. Activate air conditioning via DC motor when temperature exceeds 28°C.
2. Deactivate air conditioning when temperature falls below 21°C.

Door Control

1. Implement door operations using a servo motor.
2. Restrict commands ('open'/'close') to admin users, transmitted through mobile or PC devices.





All Hard Ware :

1. **EEPROM:** Use 24C08 or equivalent internal memory.
2. **Bluetooth Module:** HC-05 or compatible TTL module (PL2003, CH340, or CP2102).
3. **Transistors and Relays:** Five for basic lamp control (replaceable with LEDs).
4. **Dimming Circuit:** Single transistor and solid-state relay.
5. **Temperature Sensor:** LM35 or equivalent.
6. **DC Motor:** Two NPN transistors for air-conditioner operation.