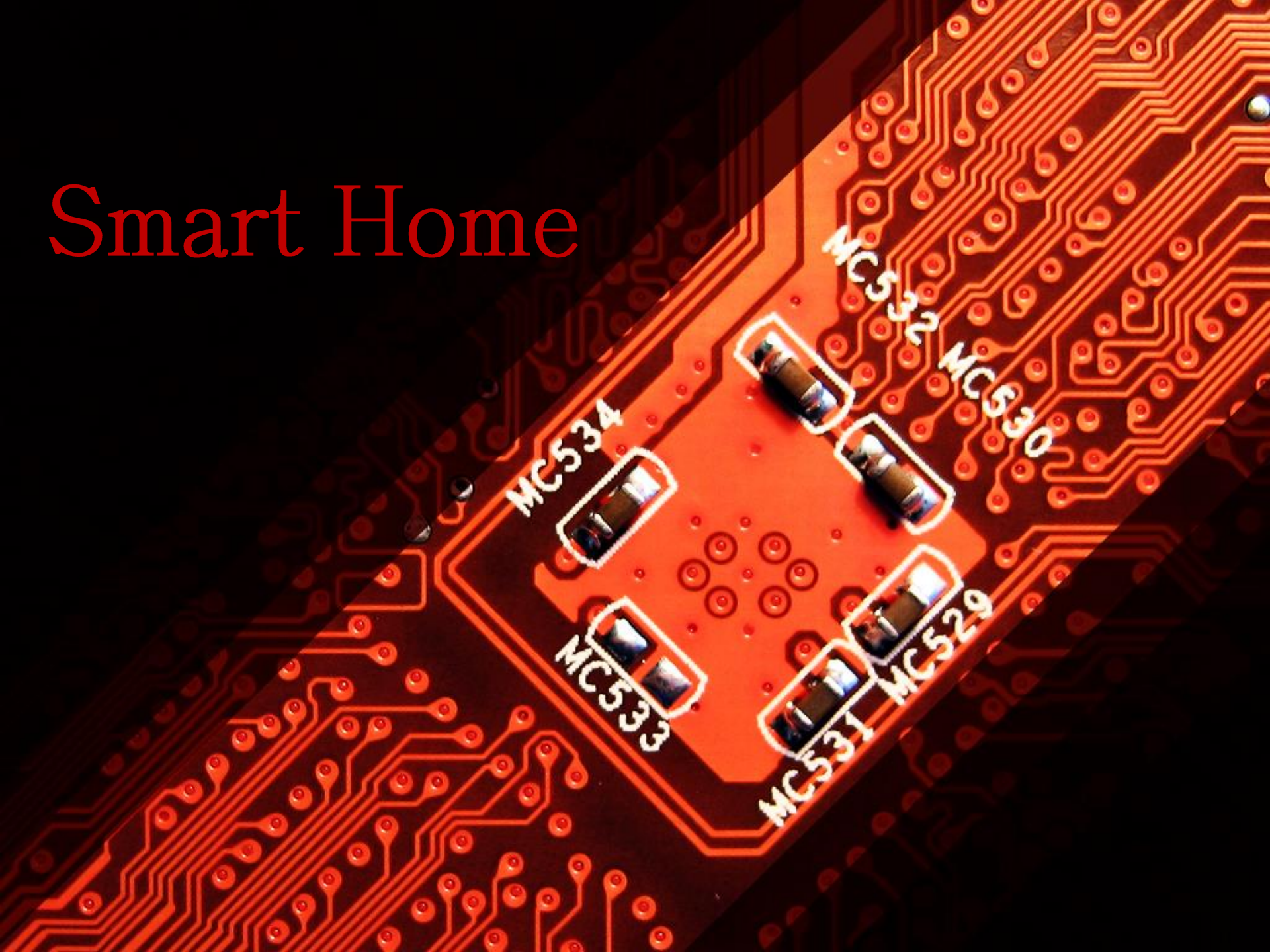
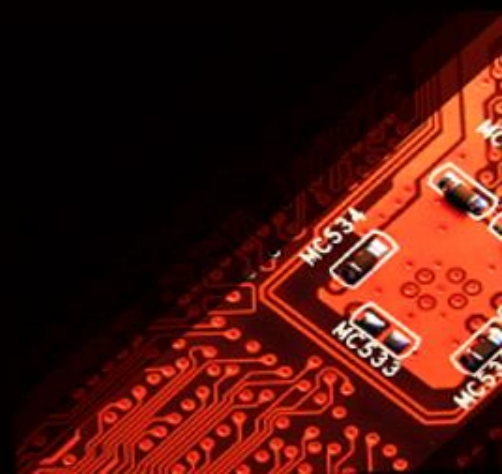
Smart Home



Smart Home

- **Home automation** is building automation for a home, called a **smart home** or **smart house**. A home automation system will monitor and/or control home attributes such as lighting, climate, entertainment systems, and appliances. It may also include home security such as access control and alarm systems. When connected with the Internet, home devices are an important constituent of the Internet of Things ("IoT").



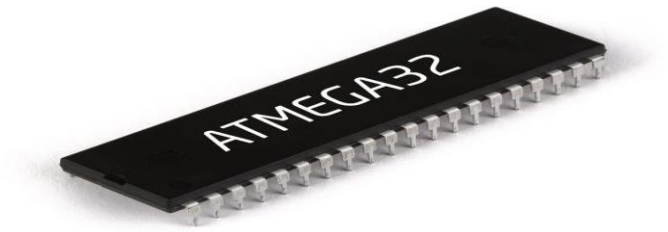
Used Components

- ATMega32 Microcontroller.
- LCD.
- Keypad.
- Servo motor (Door).
- DC Motor (Air Conditioner).
- EEPROM.
- Temperature Sensor.
- Buzzer (Alarm).
- LEDs.

Project Requirements

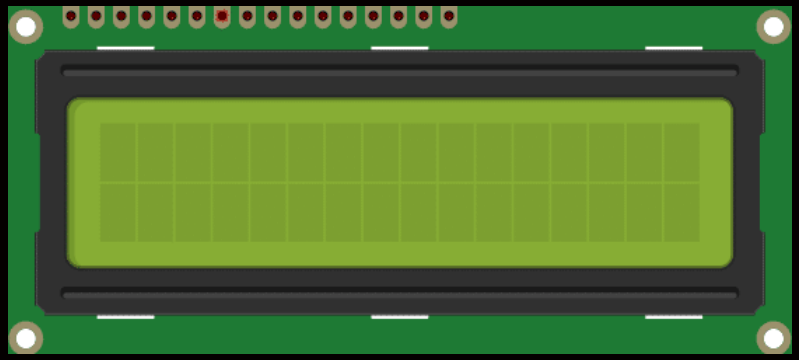
- Remoted controlled by mobile or lab top.
- For emergency cases or controlling without mobile or lap-top use LCD and Keypad “user mode only”.
- The controllable things are 6 lamps “5 on/off lamps, door, air-condition according to the ambient temperature.
- Login system admin and user “admin is remoted only”.
- Admin mode can register any user or remove.
- Usernames and password must be kept into memory even if the system is powered off.
- If admin or any user or passwords are entered wrong more than 3 trial, the system must break down and fire alarm until reset.
- Admin and user can access to all applies except user cannot control the door opening.

ATMega32 Microcontroller



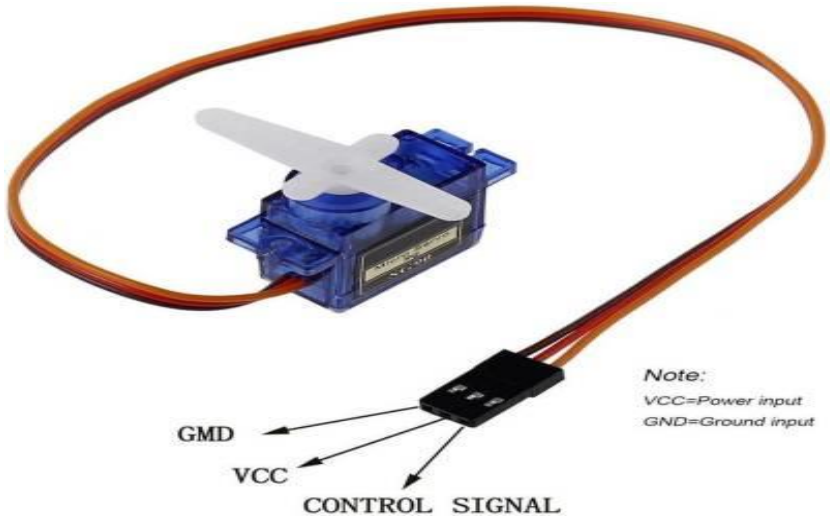
The high-performance, low-power Microchip 8-bit AVR® RISC-based microcontroller combines 32 KB ISP flash memory with read-while-write capabilities, 1 KB EEPROM, 2 KB SRAM, 54/69 general purpose I/O lines, 32 general purpose working registers, a JTAG interface for boundary-scan and on-chip debugging/programming, three flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a universal serial interface (USI) with start condition detector, an 8-channel 10-bit A/D converter, programmable watchdog timer with internal oscillator, SPI serial port, and five software selectable power saving modes. The device operates between 1.8-5.5 volts.

(LCD) & Keypad System



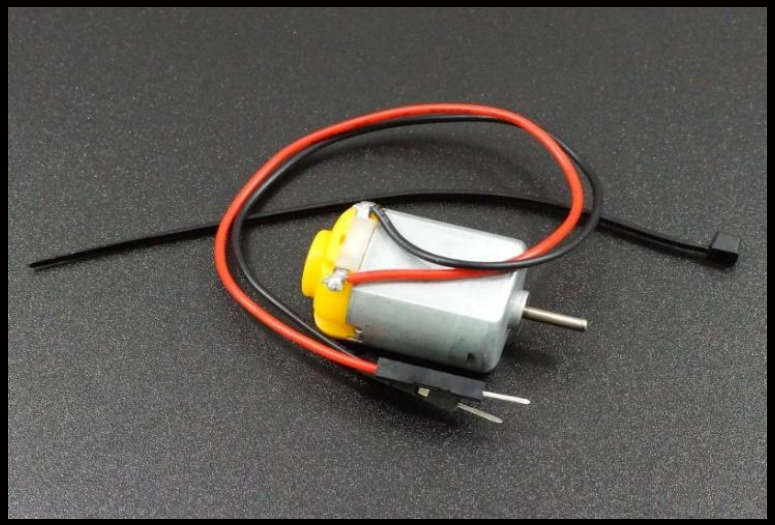
- If LCD & Keypad system is used then, Keypad is used to login to system and control all features except opening door as user only.
- If LCD & Keypad system is used then, LCD used to display the username and password.
- LCD used to display the running device if the LCD & Keypad system isn’t used.

Servo Motor (Door)



- Only in Admin mode , the door could be controlled .
- It rotates by 0 degree in case of closed , and by 90 degrees in case of opened .

DC Motor & Temperature sensor



- when temperature sensor reads above 28 degrees Celsius, The DC Motor which related to air conditioner automatically rotates which means that the air conditioner is on.

- when temperature sensor reads below 21 degrees Celsius, The DC Motor which related to air conditioner automatically stoppes which means that the air conditioner is off.

LEDs & Buzzer

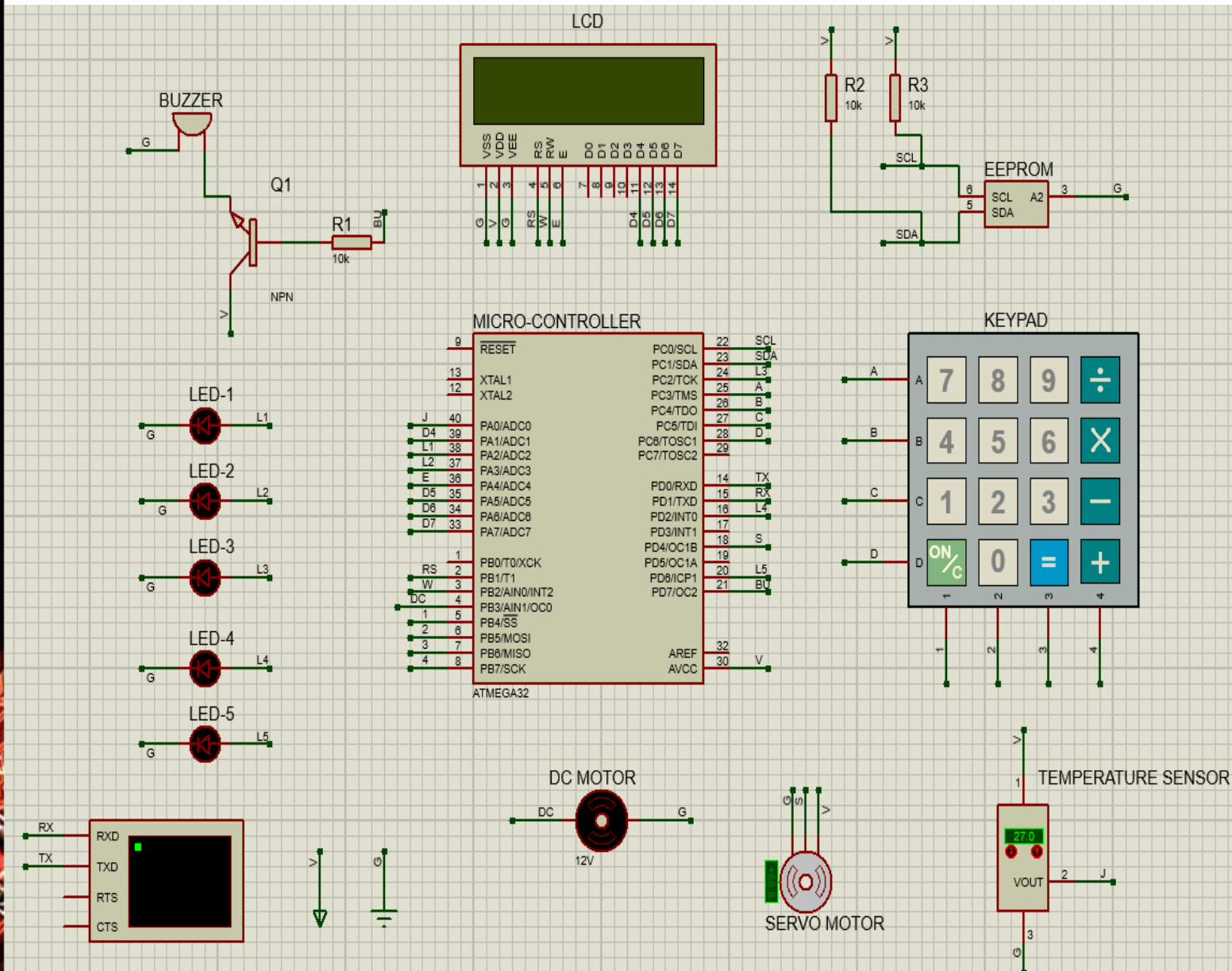
- LEDs are on when the Admin or User gives a command to turn light on all over the home .

- Buzzer will be turned on when the Admin or User write the wrong password or username more than three times.

EEPROM

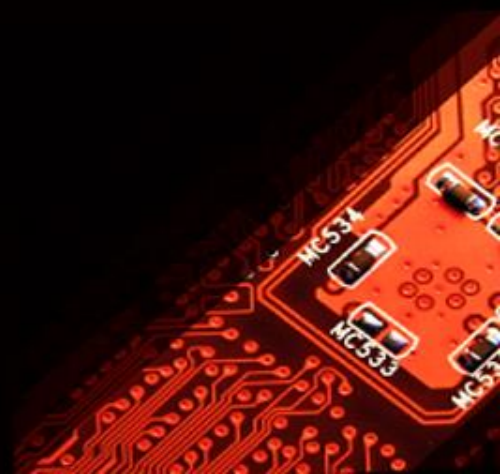
- It used to save or read the username and password.
- So, when admin only signed up, the controller would send new information to stored in EEPROM.
- In case of signed in for admin or user, the microcontroller would check if the information is right or wrong to control the system.

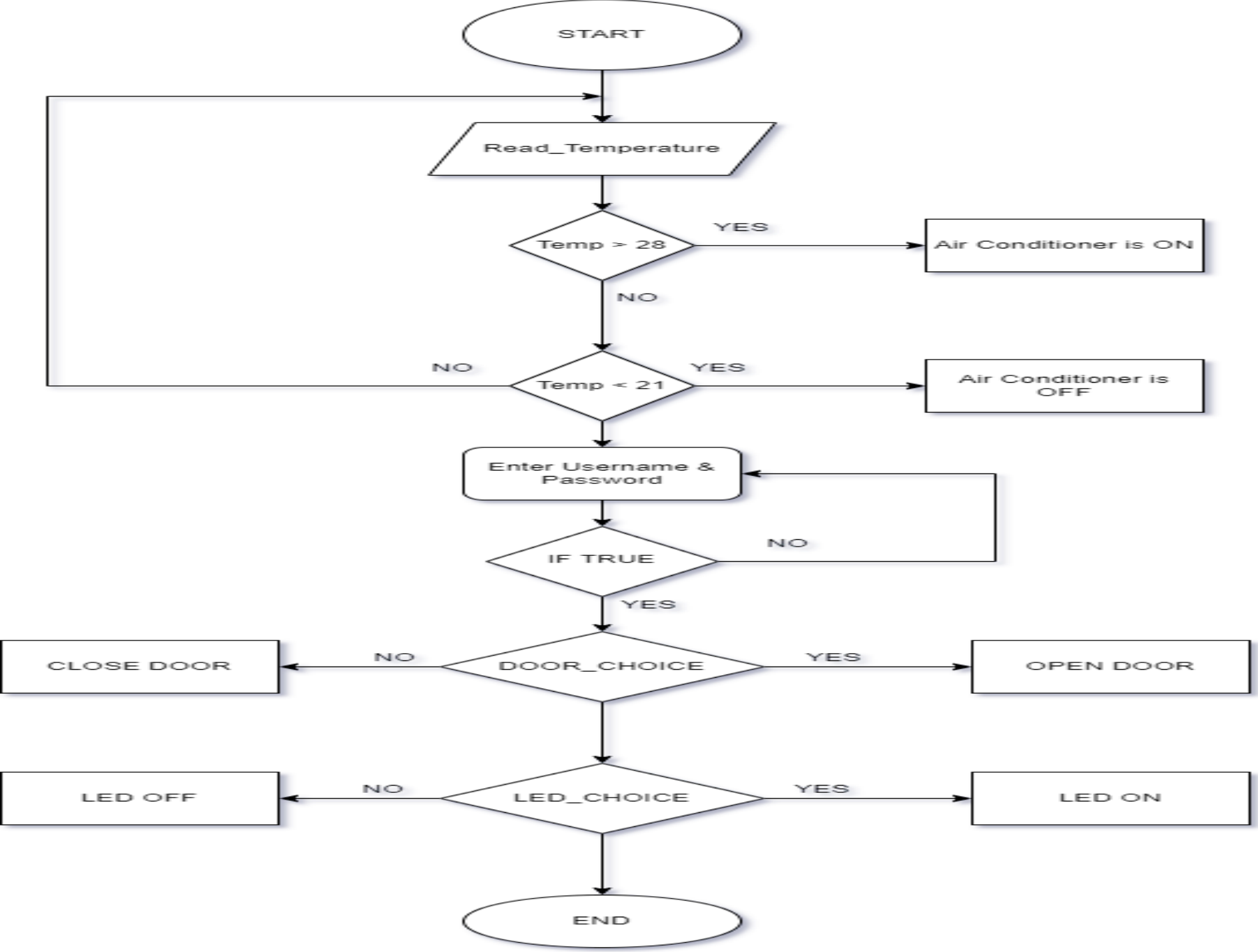
Proteus Simulation



Proteus Components

- ATMEGA32 (Microcontroller)
- BUZZER
- KEYPAD-SMALLCALC
- LED-GREEN
- LM016L (LCD)
- MOTOR
- MOTOR-PWMSERVO
- NPN (Transistor)
- RES (Resistor)
- LM35 (Temperature Sensor)
- VIRTUAL TERMINAL




START
Read_Temperature
Temp > 28
YES
Air Conditioner is ON
NO
Temp < 21
NO
YES
Air Conditioner is OFF
Enter Username & Password
IF TRUE
NO
YES
DOOR_CHOICE
NO
CLOSE DOOR
YES
OPEN DOOR
LED_CHOICE
NO
LED OFF
YES
LED ON
END

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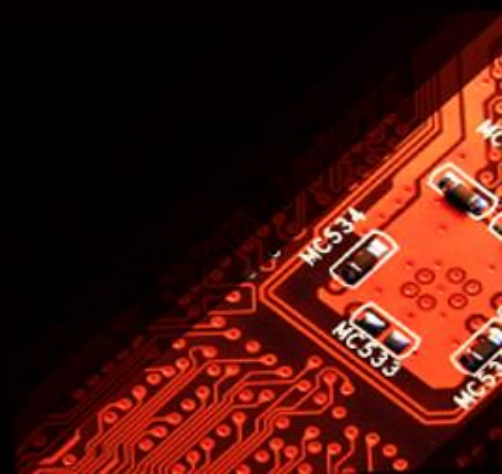

THANK YOU