Project Report

Title: Simulation of Smart Home Management System

Course: CSE323

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Introduction

Our project idea is similar to what we are familiar with as a smart home management system nowadays. Our goal is
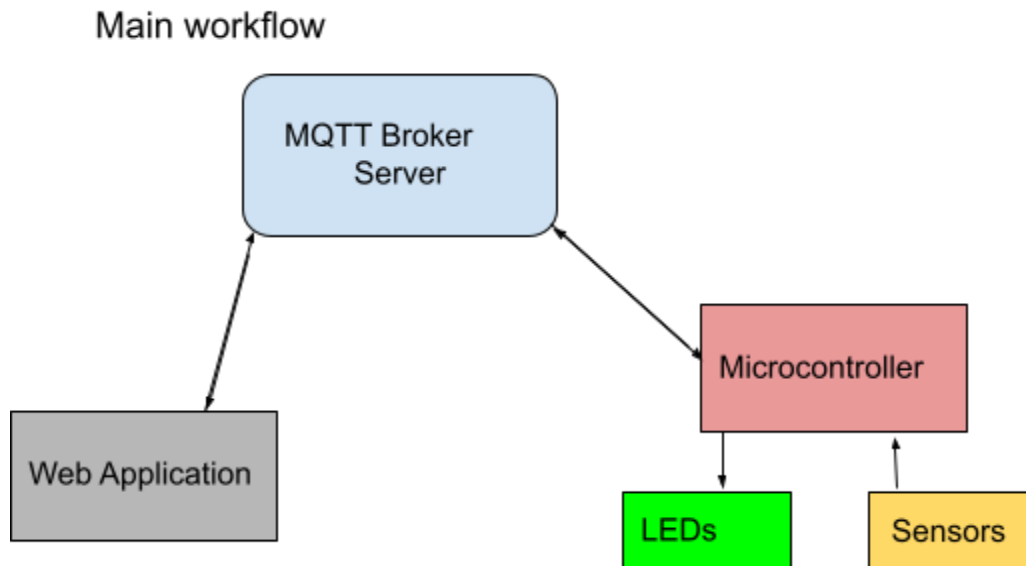1. Sending user commands to devices
2. Getting information from the devices.

To simulate our idea, we choose to turn on/off lights by user commands from a webpage and get the temperature and humidity from the device to the user.
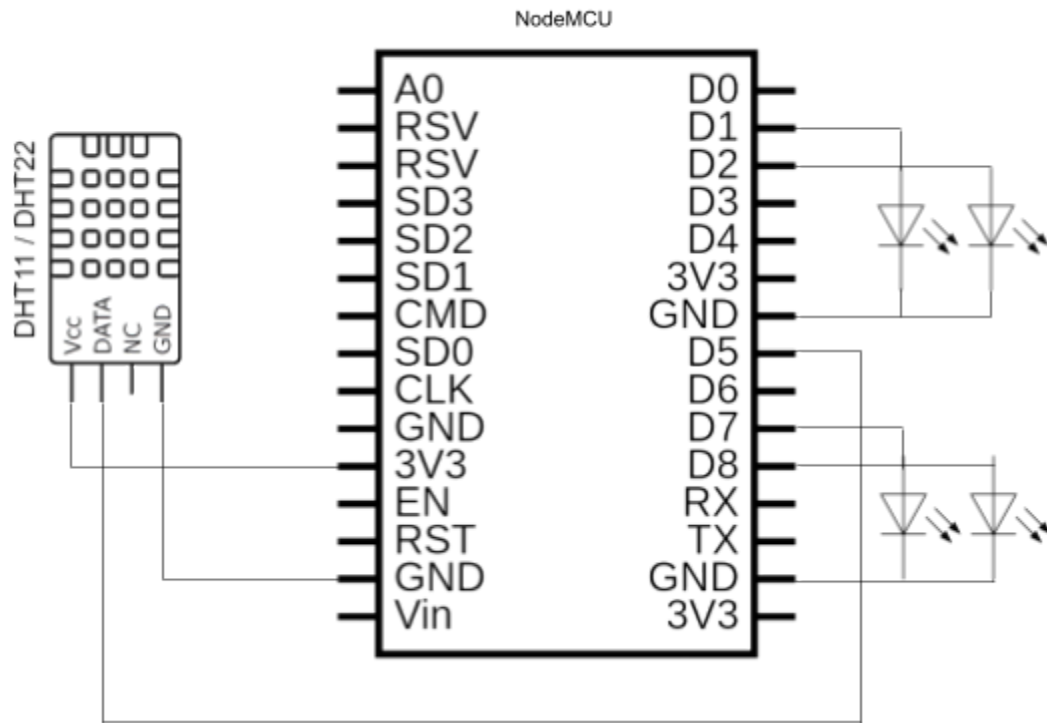
In the web application, the user can turn on or off 4 LED lights attached to the microcontroller. There is a dashboard for visualizing temperature and humidity around the device.

To establish the connection between user applications and devices, we have created a custom webpage and used a public MQTT broker server.
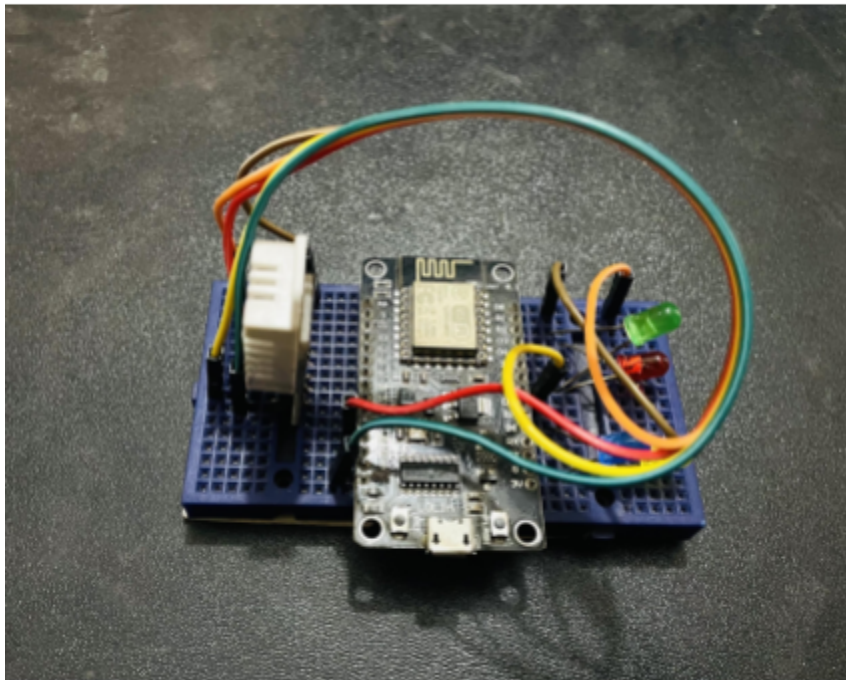
Working Diagram

Circuit Diagram

NodeMCU

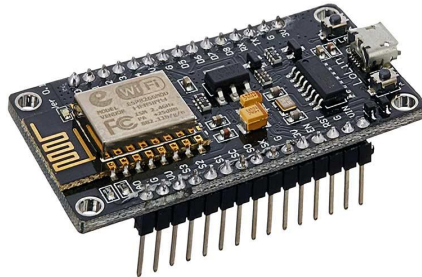| DHT11 / DHT22		NodeMCU	
Vcc	A0	D0	
DATA	RSV	D1	
NC	RSV	D2	
GND	SD3	D3	
	SD2	D4	
	SD1	3V3	
	CMD	GND	
	SD0	D5	
	CLK	D6	
	GND	D7	
	3V3	D8	
	EN	RX	
	RST	TX	
	GND	GND	
	Vin	3V3	

Working Device

Components

- **NodeMCU**: We used NodeMCU(ESP8266) as our microcontroller. This microcontroller is very capable and lower in cost compared to others. The most significant benefit of using nodeMCU is its built-in WiFi module.

- **DHT22**: To measure the temperature and humidity of the surroundings, we have used a DHT22 sensor. This sensor is very useful and easy to use since it has its library for the Arduino programming interface.
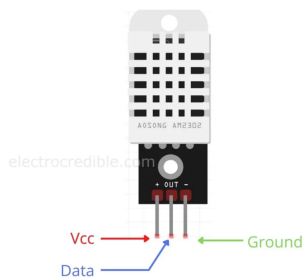

- **LED**: Mini LEDs are used to simulate light bulbs.

- **Breadboard**: Breadboard for making the circuit and connecting everything.
- **Wires**: to connect components with the microcontroller.
- **Software:** To program the NodeMCU, we used ArduinoIDE. And created a user interface with web technologies. We used the MQTT (Message Queuing Telemetry Transport) protocol instead of the commonly used TCP/IP protocol to establish the communication channel.
- Web Application: **https://withtahmid.github.io/323/**

Result- Data

This image shows the microcontroller is not connected to the internet.
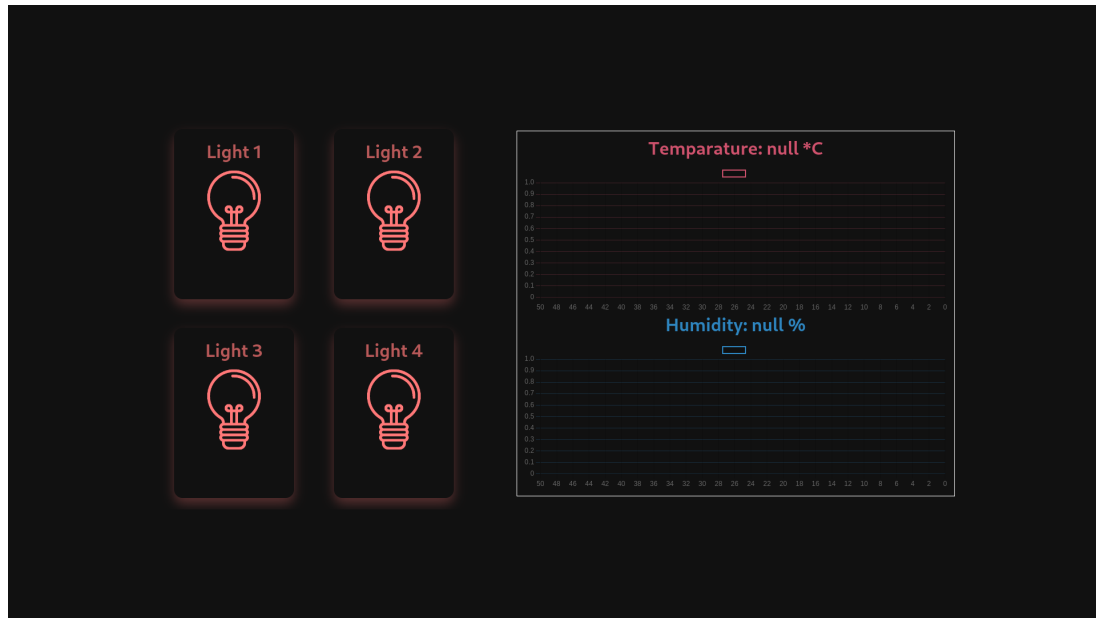
This image shows the microcontroller is connected to the internet. Temperature is 29.2 degrees Celsius, humidity is 64.7%, and two LEDs are currently on.