Home Security System

United International University

Computer Networks Lab Project

Report: 1

Date: 27.05.2022

Name: Md.Saiful Islam **ID:011181292**
Name: Joyshree Sarkar **ID:011181169**
Name: Sreeja Dey **ID:011181164**
Name: Supti Saha **ID:011182050**

Section: C

Introduction

In this IoT project, I have shown how to make IoT-based Home Automation project using NodeMCU and new Blynk app to control a 4-channel relay module from the manual switch & smartphone.During the article, I have shown all the steps to make this Blynk home automation system. The circuit for this NodeMCU Blynk home automation project is very simple. Here I have used an active low 5V relay module. I have used the INPUT_PULLUP function in the code instead of connecting pull-up resistors with the push buttons.I have used a old 5V mobile charger to supply the circuit.

Related Works

1. Home Automation using NodeMCU & Alexa
2. Wifi & Voice Controlled Home Automation Using NodeMCU & Android
3. IoT Home Automation using ESP8266 Web Server
4. Home Automation using Google Firebase & NodeMCU ESP8266
5. **H**ome Automation with Arduino IoT Cloud & ESP32

Problem Statement

The main objective of this project is to develop a home automation systemusing an Arduino board with Bluetooth being remotely controlled by any AndroidOS smartphone....Modern houses are gradually shifting from conventional switchesto centralized controlsystem,involving remote controlled switches.Ever thought of a life where you could just command your home appliances to workas you need just by using your voice?Gone are the days where you have to be a billionaire like TonyStark to have an automated house which is voice activated.Inthis short tutorial I'm going to show you how you can control your electronicappliances like T.V,fans,light set cover the internet with your voice and that to undera low budget.You can follow this tutorial even if you have no prior knowledge aboutProgramming or NodeMCU.So lets begin learning HomeAutomation Using NodeMCU and GoogleAssistant.Home automation is anything that enables you to use your home's lighting, heatingand appliances more conveniently and efficiently. It can be as simple as remote orautomatic control of a few lights, or it can be a complete system that controls allmajor parts of your home. Custom set to your own personal preference.It focuses on wireless home automation technologies - these are easy to retrofit intoexisting homes now need for new wiring and no ripping up the carpets or drillingholes in the walls.Each technology has its own unique features and benefits that makes some moresuited to particular applications, whilst others can be seen for all general homeautomation installations.

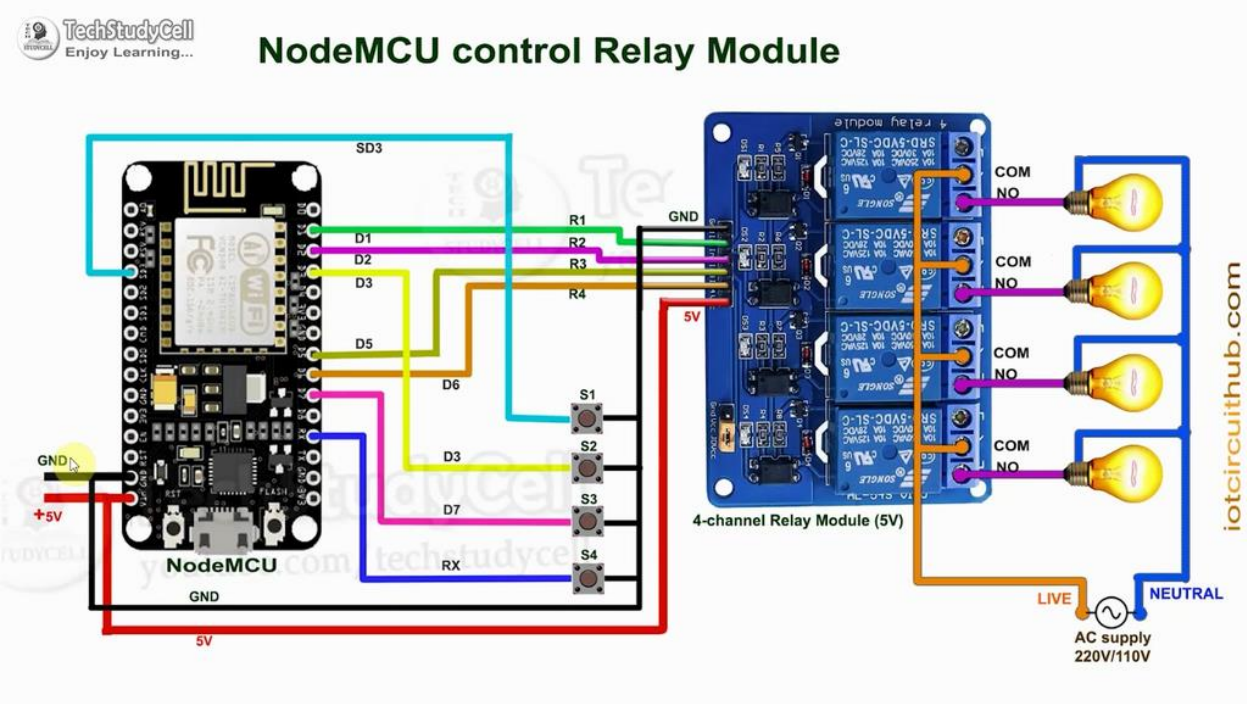
Possible Outcome

●It can operate anywhere through the world
●Security against burglars
●It is available at low cost.
●Voice control home function.
●Managing all of your home devices from one place. The convenience factorhere is enormous.
●Flexibility for new devices and appliances.
●Maximizing home security.
●Remote control of home functions.
●Increased energy efficiency.
●Improved appliance functionality.
●Home management insight

Proposed system and architecture

This is the complete circuit diagram for this home automation project. I have explained the circuit in the tutorial video.

The circuit is very simple, I have used the GPIO pins D1, D2, D5 & D6 to control the 4 relays. And the GPIO pins SD3, D3, D7 & RX are connected with push buttons to control the 4 relays manually.I have used the INPUT_PULLUP function in Arduino IDE instead of using the pull-up resistors.
I have used a 5V mobile charger to supply the smart relay module.
The D3 pin should not be connected with GND during the booting process of NodeMCU.



Experimental Setup and Results

Need Components

1.Bread board
2.ESP8266
3.Relay
4.Connecting wires
5.DC fan
6.LED
7.Mobile phone with Google assistant
8.Blynk app
9.Arduino IDE
10.Wi-Fi router or mobile Hotpost

Result:

The Home Automation System is operating with NodeMCU ESP8266 controller andthe command is given by the Blynk application in a mobile phone using the WiFinetwork. The NodeMCU ESP8266 has an inbuilt WiFi module and the devicesconnected with Home Automation System. Both WiFi is connected with anauthentication token.The heart of today's

project is the WiFi enabled board that needs no introduction tothe ESP8266 based NodeMCU_development board. It is an open source platformfor developing WiFi based embedded systems and it is based on the popularESP8266 WiFi module, running the NodeMCU firmware. NodeMCU was born outof the desire to overcome the limitations associated with the first versions of theESP8266 module which was not compatible with breadboards. It was difficult to power and even more difficult to program. The NodeMCU board is easy to use.Low cost and that quickly endeared it to the heart of makers and it is one of the most popular boards today. For this project two channel relay modules are added to theESP8266 board

Conclusion and Future Work

Using this system as a framework. The system can be expanded to includevarious other options which could include home security features like capturing the photo of a person moving around the house and storing it onto the cloud. This willreduce the data storage that using the CCTV camera which will record all the timeand stores it. The system can be expanded for energy monitoring or weather stations.This kind of a system with respective changes can be implemented in the hospitalsfor disable people or in industries where human invasion is impossible or dangerousand it can also be implemented for environmental monitoring.Future scope for the home automation systems involves making homes even smarter.Homes can be interfaced with sensors including motion sensors, light sensors andtemperature sensors and provide automated toggling of devices based on conditions.Home automation offers a global standard for interoperable products.The home automation market is primarily driven by growing need for effectivesolutions in various domestic applications such as lighting, safety and security,energy management, entertainment, heating, ventilation, and air conditioning

Conclusion

The Home automation using Internet of Things has been experimentally proven to work satisfactorily by connecting simple appliances to it and theappliances were successfully controlled remotely through internet. The designedsystem not only monitors the sensor data like temperature, gas, light, motion sensor but also actuates a process according to the requirement. For example, the switchgets dark. It also stores the sensor parameters in the cloud (Gmail) in a timelymanner. This will help the user to analyse the condition of various parameters in thehome anytime anywhere.The home automation using Internet of Things has been experimentally proven towork satisfactorily by connecting simple appliances to it and the appliances weresuccessfully controlled remotely through Internet. Home automation is undeniablya resource which can make a home environment automated. People can control theirelectrical devices via these home automation devices and set up controlling actionsthrough mobile. In future this product may have high potential for marketing.Further it can be demonstrated from computer instead of mobile phones forcontrolling appliances of any large places like industries, hospitals, institutions etc.

Reference

1. **https://iotcircuithub.com/nodemcu-esp8266-blynk-home-automation/**
2. **https://www.instructables.com/ESP8266-Home-Automation-Project-Using-NodeMCU-and-/**
3. **https://how2electronics.com/iot-home-automation-using-blynk-nodemcu-esp8266/#:~:text=In%20this%20Home%20Automation%20System,smartphone%20wirelessly%20through%20the%20internet.**
4. **https://www.academia.edu/42640653/Home_automation_using_NodeMCU_Google_assistant**
5. **https://srituhobby.com/how-to-make-a-home-automation-system-using-the-nodemcu-esp8266-board-and-the-new-blynk-app/**