

Name of the Students:	Roll No.	Date:
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Experiment No.-7

WEB BASED HOME AUTOMATION

Title: Web based Home Automation

Introduction:

SMART home technology uses devices connected to the Internet of things (IoT) to automate and monitor in-home systems. SMART home technology allows users to control and monitor their connected home devices from SMART home apps, smartphones, or other networked devices. Users can remotely control connected home systems whether they are home or away. This allows for more efficient energy and electric use as well as ensuring your home is secure. SMART home technology is now being used to create SMART cities.

Theory:

Home automation or domestic building automation for a home, called a smart home or smart house. A home automation system will control 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.

A home automation system typically connects controlled devices to a central hub or “gateway”. The user interface for control of the system uses either wall-mounted terminals, tablet or desktop computers, a mobile phone application, or a Web interface, that may also be accessible off-site through the Internet.

Hardware:

1. NodeMCU
2. Connectors
3. Router
4. Relay Board

Software:

1. Arduino IDE

CircuitDiagram:

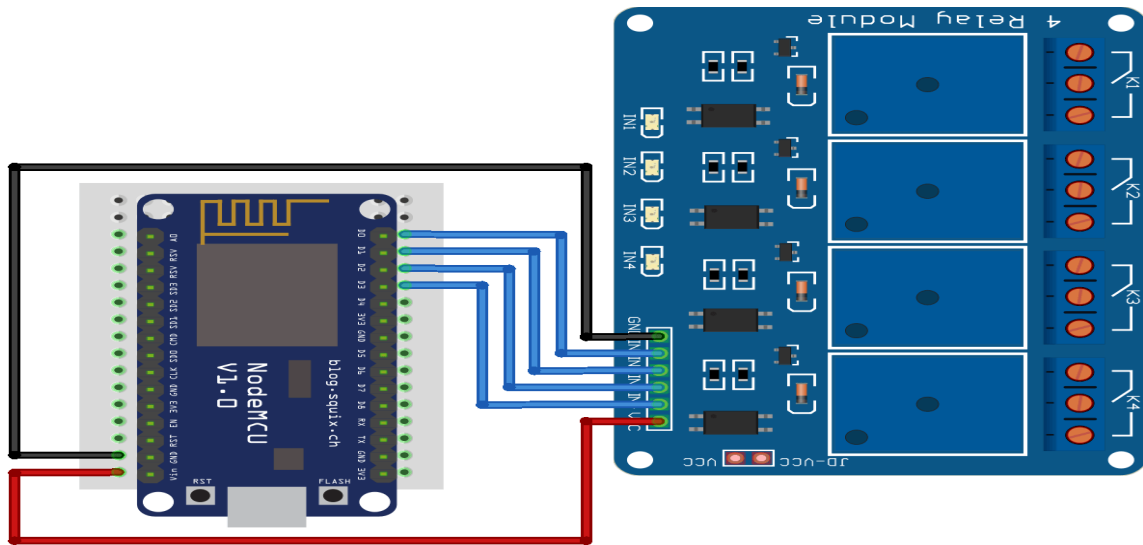


Fig1:CircuitdiagramofNODEMCUandRelayBoard

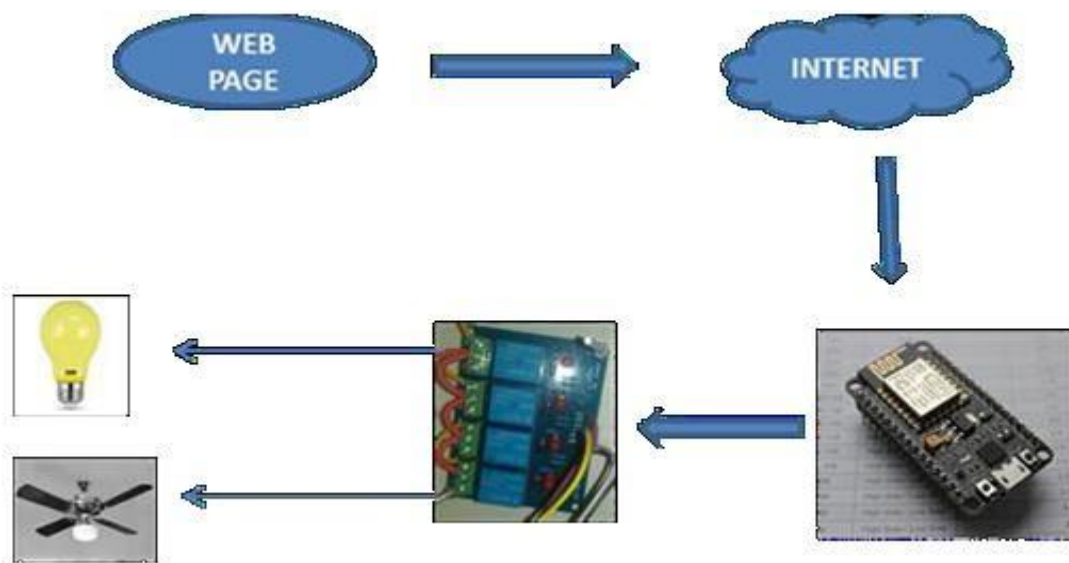


Fig2:DataTransferbetweendevices

The practical aims at designing an advanced home automation system using normal web server and Wi-Fi technology. The devices can be switched ON/OFF and sensors can be read using a Personal Computer (PC) or mobile devices through Wi-Fi. Automation is the most frequently spelled term in the field of electronics. The hunger for automation brought many revolutions in the existing technologies. These had greater importance than any other technologies due to its user-friendly nature. These can be used as a replacement of the existing switches in home which produces sparks and also results in fire accidents in few situations. Considering the advantages of Wi-Fi an advanced automation system was developed to control the appliances in the house.

Wi-Fi (Short for Wireless Fidelity) is a wireless technology that uses radio frequency to transmit data through the air. Wi-Fi has initial speeds of 1mbps to 2mbps. Wi-Fi transmits data in the frequency band of 2.4 GHz. It implements the concept of frequency division multiplexing technology. Range of Wi-Fi technology is 40-300 feet. The controlling device for the automation in the project is a Nodemcu. The data sent from PC over Wi-Fi will be received by Wi-Fi module connected to 9 Nodemcu. Nodemcu reads the data and decides the switching action of electrical devices connected to it through Relays.

Day by day, the field of automation is blooming and these systems are having great impact on human beings. The project which is to be implemented is a home automation using Easy IOT Webserver and WIFI and has very good future development. In the current system webserver is installed on a windows PC so the home appliances can be controlled using only by using the device on which webserver is installed. This can be further developed installing webserver on cloud.

Advantage of installing webserver on the cloud is that home can be controlled by using any device which has WIFI 802.1 and a web browser. By visiting the IP address of the cloud the control actions can be taken.

Procedure:

1. Connect Nodemcu mobile on the same network.
2. Compile and download the code to the Nodemcu.
3. Connect relay board to Nodemcu and connect appliances to the relay board.
4. Open any browser in mobile and connect to the IP provided by the Nodemcu on the serial terminal (Ex. 192.168.123.19).
5. Login with credentials and turn ON/OFF device with Buttons.

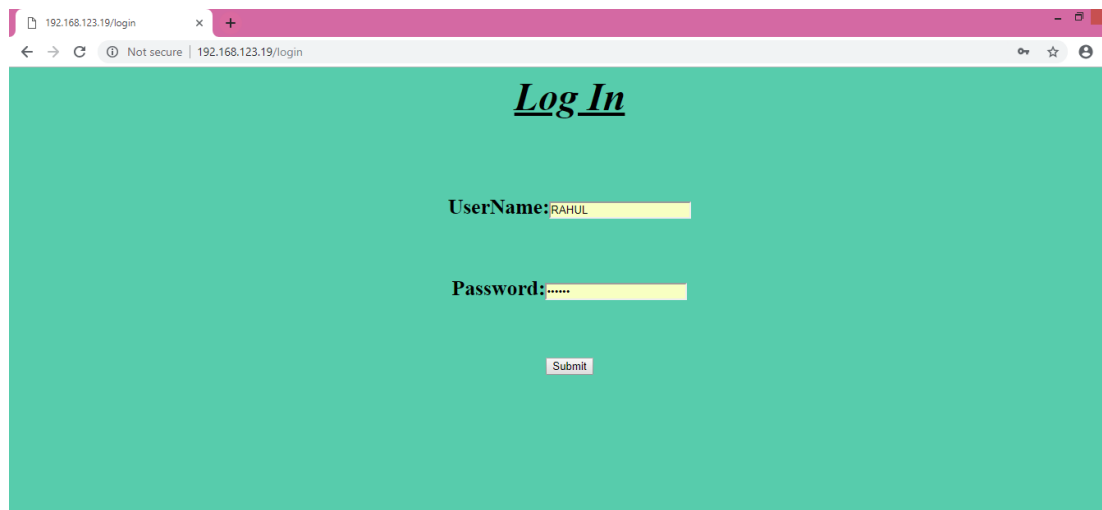


Fig3:LoginPage



Fig4:controllingpage

Result:

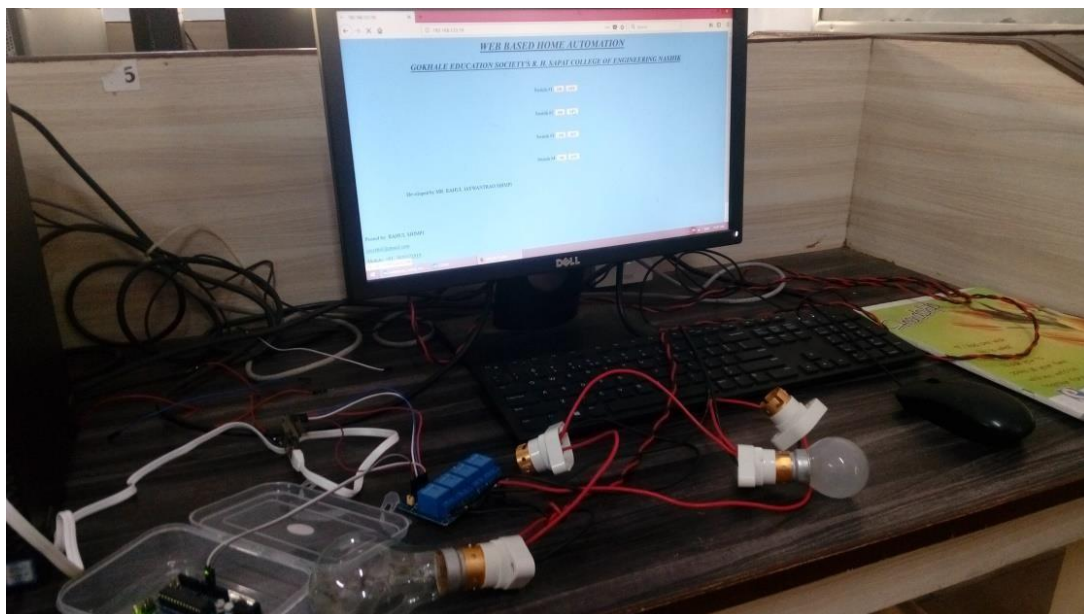


Fig5:AllLampsOFF

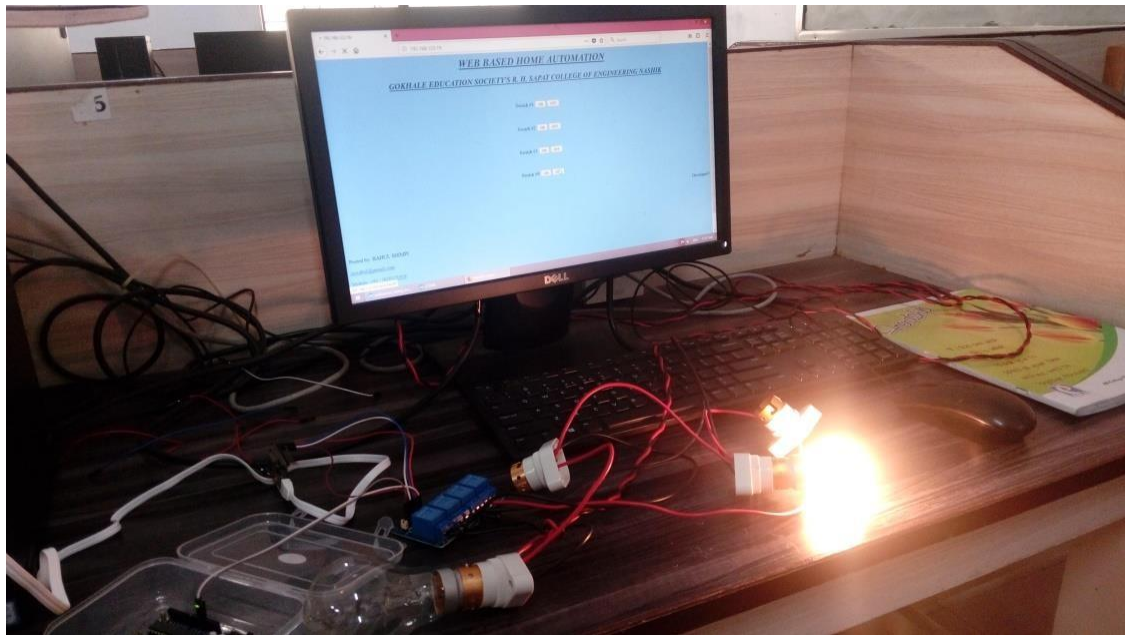


Fig6:Lamp1ON

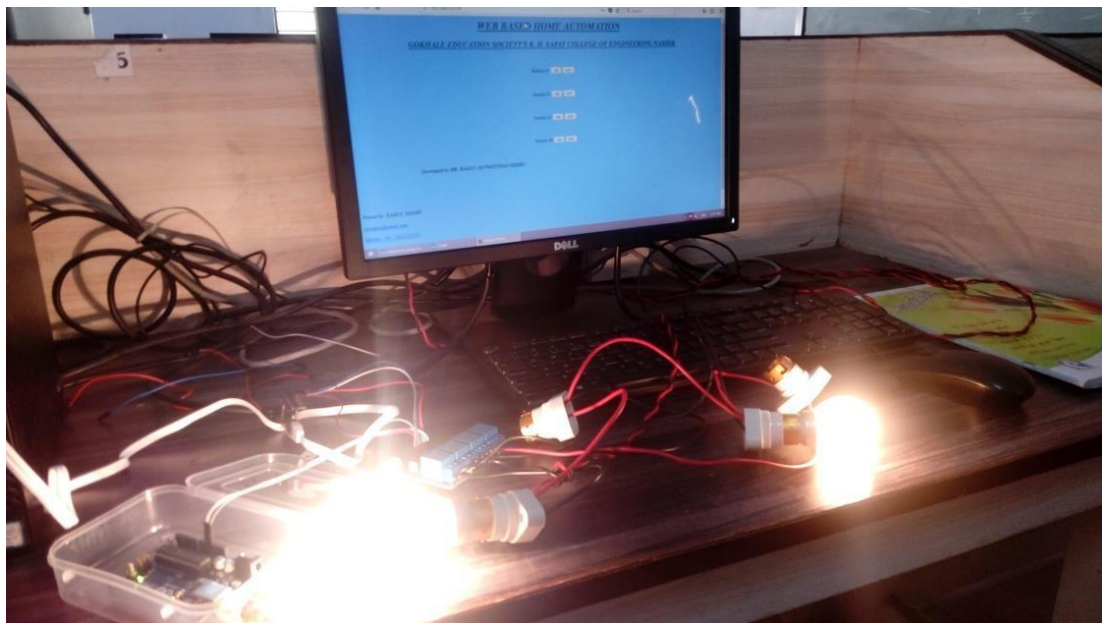


Fig7:Lamp2ON

Conclusion:

TinkercadSimulationLink:

<https://www.tinkercad.com/dashboard?type=circuits&collection=designs>