PROJECT REPORT

ON

HOME AUTOMATION SYSTEM

(VI th Semester Mini-Project)

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SUBMITTED TO:

Mr. Deepak Uniyal

Mr. Saurabh Misra

SUBMITTED BY:

Aanchal Sharma

Uni Roll No- 2014352

Section - CST

ABOUT THE PROJECT:

The motive of this project is to create a model using Internet of Things Technology (IOT) for Home Automation System which is one of the main part of the smart city project.

Home Automation means to control the electronic devices without any physical activity by connecting the e-devices to the network and accessing them using voice commands or mobile application. Home Automation makes life convenient and saves money by excluding heat, cooling and electricity bills.

It will also include domestic security features such as access management and alarm systems. Domestic devices are a key component of the Internet of Things once they are linked to the internet.

Building automation for a home, also known as a sensible home or smart house, is referred to as home automation. The IoT-based Home Automation system has several benefits over wired systems, including ease-of-use, ease-of-installation, avoiding the complexity of running through cables or weak electrical connections, easy problem detection and triggering, and most all, easy mobility.

SMART HOME COMPONENTS USED IN THIS MODEL:

- Component 1:

Smart Lightning: To show smart lightning I have used two LEDs in two different rooms. Smart lighting for the house saves energy by adjusting to the environment and turning on/off or dimming the light as needed. Smart lighting systems for homes save energy by sensing human movement and their surroundings and changing the lights accordingly.

- Component 2:

Smart Appliances: To show smart appliances, I have used servo motor as fan which will work with the help of the hand gesture or the application. Smart appliances with administration are already available, and they can also send status information to users remotely.

REQUIREMENTS FOR THE PROJECT

- **Hardware Requirements:** Following are the hardware required for this project: -

  - NodeMCU (ESP8266)- NodeMCU is an open-source platform based on the ESP8266 that can link items and transport data through the Wi-Fi protocol.

  - IR Sensor- Infrared sensors are increasingly commonly utilised in motion detectors, which are used in building services to turn on lights or in alarm systems to detect unwanted visitors. The sensor components detect heat radiation (infrared radiation) that varies over time and space owing to human movement in a specific angle range.

  - Servo Motor- A servo motor is a rotary actuator that enables for accurate angular position control. It is made comprised of a motor and a sensor for position feedback. To complete the system, a servo drive is required. The feedback sensor is used by the drive to accurately regulate the rotating position of the motor.

- Jumper Wires- A jumper wire is an electric cable used for connecting remote electric circuits on printed circuit boards. It is possible to short-circuit and short-cut (jump) to the electric circuit by connecting a jumper wire to the circuit.

- Breadboard- A breadboard (sometimes known as a plug block) is used to create temporary circuits. It is beneficial to designers since it permits components to be readily removed and changed. It is handy for someone who wishes to design a circuit in order to show its operation and then reuse the components in another circuit.

- LED- LEDs (light-emitting diodes) are compact, brilliant, energy-efficient lights that are widely utilised in electrical devices. An LED light is a polarised component, which means it must be connected to a circuit in a specific way in order to function properly.

- **Software Requirements:** Following are the software requirements needed for the projects:

  - Arduino Application- The Arduino IoT Cloud is a tool that allows creators to quickly, easily, and securely create linked things. You can link many devices together and have them communicate real-time data. A simple user interface allows you to monitor them from anywhere.

  - Blynk Android Application- Blynk is an IoT platform for iOS and Android devices that uses the Internet to control Arduino, Raspberry Pi, and NodeMCU. This programme is used to compile and provide the required address on the available widgets to construct a graphical interface or human machine interface (HMI).

- Google Assistant- The concept of Google Assistant-controlled home automation is the use of speech to control home gadgets. There are numerous gadgets on the market that can accomplish this, but creating our own is great. The Google assistant is required for this project.

- IFTTT- If This Then That is a private commercial enterprise that provides services that allow users to programme responses to current events. IFTTT offers collaborations with many service providers who deliver event alerts to IFTTT and execute commands that implement the reactions.

WORKING OF THE MODEL

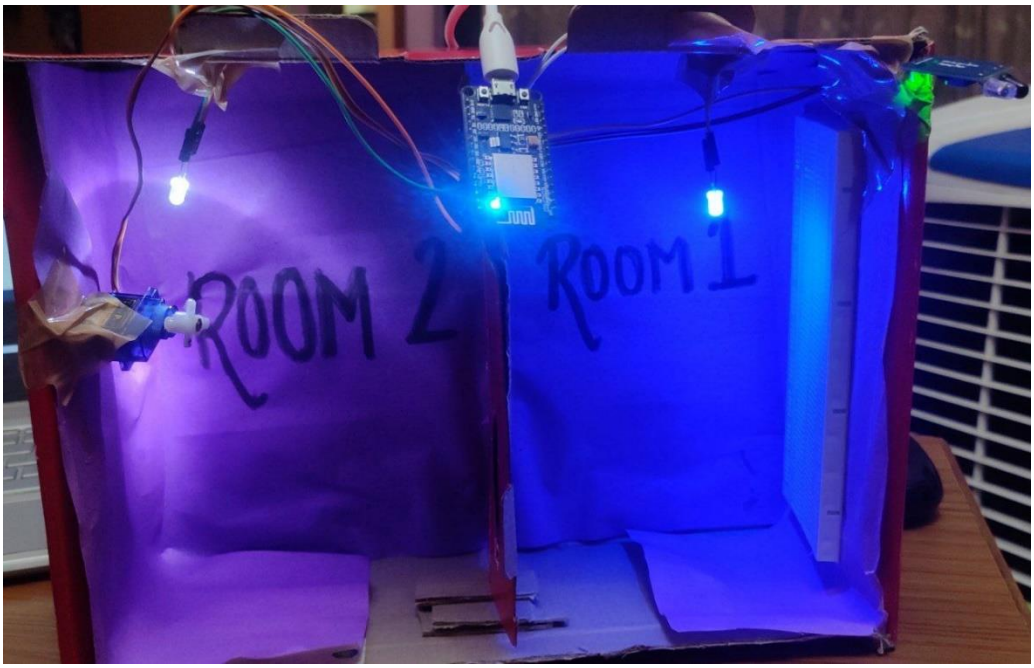
i. Arduino and the model: Arduino consist of the code of the model for 1 servo motor used as fan and 2 LEDs as light bulbs in a house. IR sensor is used as a gesture to switch on and off the lights of the model. When the code is loaded on the model then only it works as per our commands.

ii. Blynk Application: Blynk interface is used for remote accessing the project. It consists three virtualpush buttons to switch on/off appliances individually for all three appliances.

iii. Google Assistant and IFTTT: Google Assistant connected to Blynk through IFTTT service for accessing the appliances using Google voice commands. Google assistant follows the command given by the user to switch on/switch off any of the appliances. These commands are first stored in IFTTT then they are followed by google assistant.

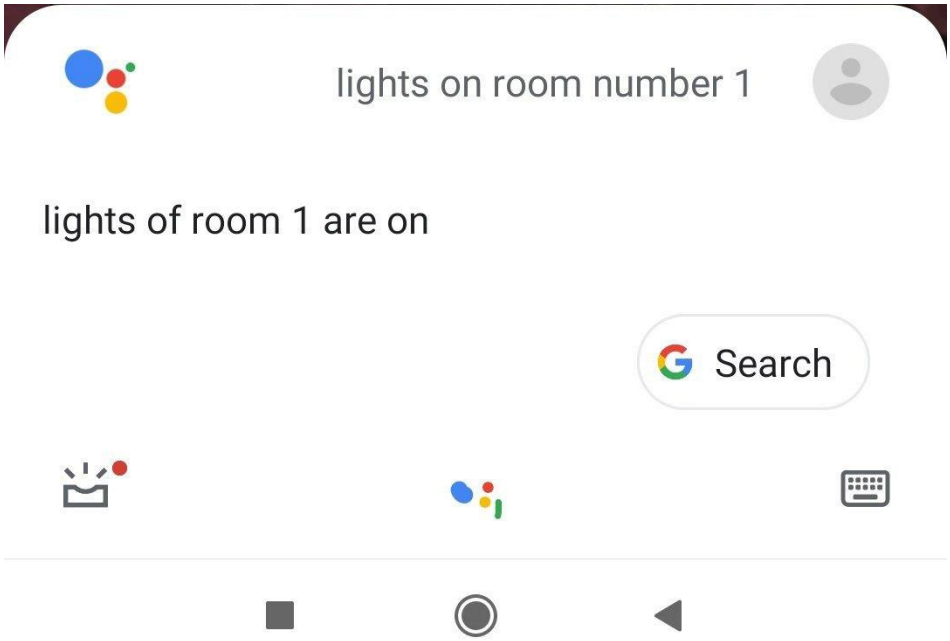
SNAPSHOTS OF THE PROJECT

Following are the snapshots of the projects showing the working: -

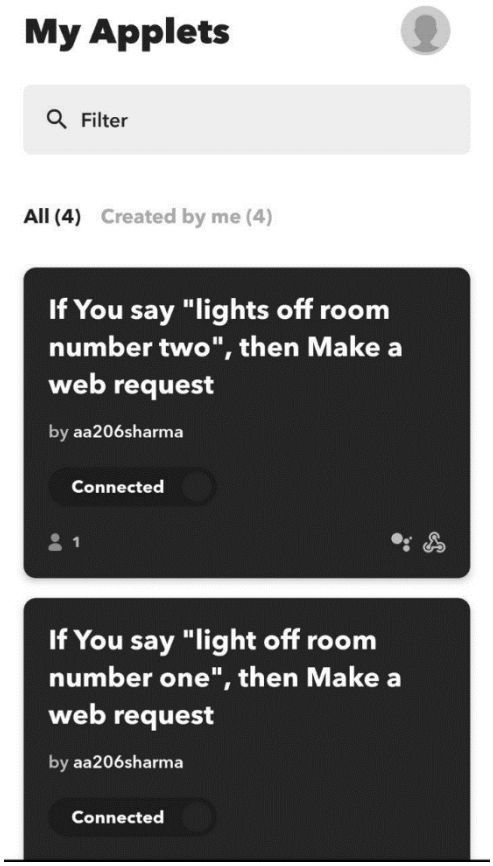


THE MODEL

The above picture shows the model with two rooms each consisting of one LED and Room 2 consisting of one servo motor acting as fan, right top corner consisting of IR sensor and in the middle we have nodeMCU.



GOOGLE ASSISTANT



IFTTT

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- https://ifttt.com/explore/google-assistant-automations
- https://smartify.in/knowledgebase/iot-based-home-automation-system/
- https://www.javatpoint.com/iot-internet-of-things