MDS PUBLIC SCHOOL UDAIPUR (RAJ.)

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CENTRAL BOARD of SECONDARY EDUCATION

Session 2019-20

All India Senior Secondary School Certificate Examination

TOPIC:- Home Automation IoT (Semiconductor Devices)

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Standard: XII Science   **PGT Physics**

1. INTRODUCTION TO IOT:

Internet of Things can connect devices embedded in various systems to the internet. When devices/objects can represent themselves digitally, they can be controlled from anywhere. The connectivity then helps us capture more data from more places, ensuring more ways of increasing efficiency and improving safety and IoT security .IoT is a transformational force that can help companies improve performance through IoT analytics and IoT Security to deliver results. Businesses in the utilities, oil & gas, insurance, manufacturing, transportation, infrastructure and retail sectors can reap the benefits of IoT by making more informed decisions, aided by the torrent of interactional and transactional data at their disposal.

2. OBJECTIVE:

The device designed in this project can be installed at the main entrance of a house. It detects motion of any visitor with the help of PIR sensor and starts capturing the images with the help of a USB web cam. The images are temporarily stored on the Raspberry Pi and pushed to the Google Cloud from where they are sent as email alert to the house owner. So, the user gets the images of any visitor immediately on email which he can check from his smart phone. The Raspberry Pi connects with the Google Cloud over TCP-IP stack. The Raspberry Pi 3 is one of the IoT boards which comes equipped with on-board TCP/IP stack, so, it can be readily connected to an IoT network. The Pi uses OpenCV library to capture images from the Web Cam and send them over registered Email address of the user. The home security system designed in this project, though being simple, is a powerful an application. The user can keep surveillance of his house from anywhere, any time and always by just installing this small device at the main entrance. Many such devices can also be installed to further add security layers. The entrance of any intruder can be detected and alerted by the Email on the smart phone, then the user is free to take appropriate action like calling police, informing law enforcement etc.

3. PROBLEM STATEMENT:

- Need to build a prototype for intruder alert system using a microcontroller Raspberry pi 3. Intruder alert system should use the following function:
- The Smart home security system should be fed inside the room if any obstacle is detected by the pir sensor, the bulb glows
- It also simultaneously clicks the photo of the intruder.

- Whenever the light glows, an alert email notification is send to the owner of the house along with the photo attachment and the owner is able to get the image of the intruder, also the owner gets notification mobile.
- Build Java ME program to implement the relay.
- Python program to implement the pir sensor and activate the alert system and clicks the photo through USB Web camera.
- Python program to get the pushover notification.

4. CIRCUIT DESIGN:

Raspberry pi 2   Relay module   Home appliances
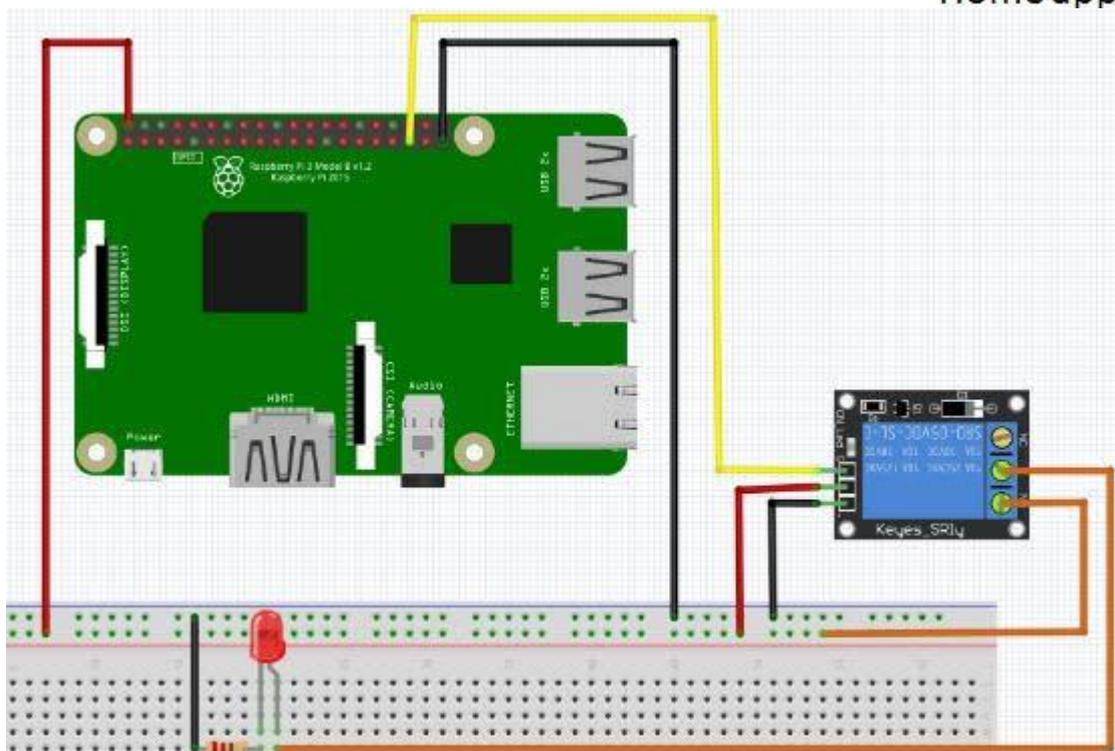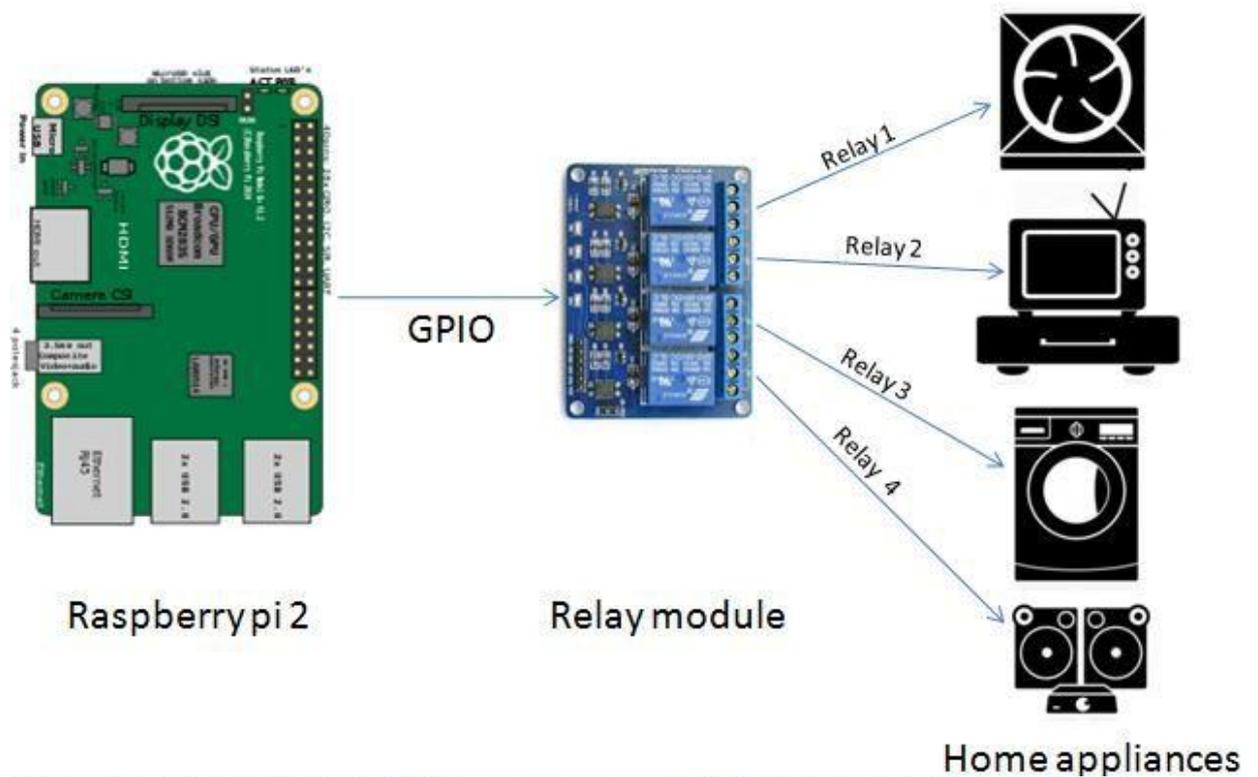
5. REQUIREMENTS:

Microcontroller and Accessories:
• Raspberry Pi 3 Microcontroller
• PIR Motion Sensor
• Jumper Wires
• Power Source
• Relay module
• USB Web camera
• Bulb

Software & Development Tools:
• Net beans IDE 8.1
• Java ME SDK 8.3
• Java ME Embedded (For Raspberry Pi)
• Python IDLE 3.6
• Pushover

6. Procedure of Operation:

- Plug in the main circuit board to the mains.
- Create a Wi-Fi Hotspot name "ZUK Z1" using a mobile and set password to"hs12345678" (without Quotation Mark) so that the device can connect to network
- Connect a Mobile/Laptop to the same Wi-Fi Network.
- Go to http://raspberrypi.local:5000 using browser of choice.
- Thereby you will be displayed with the interface of switches
- Click or press corresponding button on the webpage to toggle the corresponding switch
- Plug the devices to the switch board.
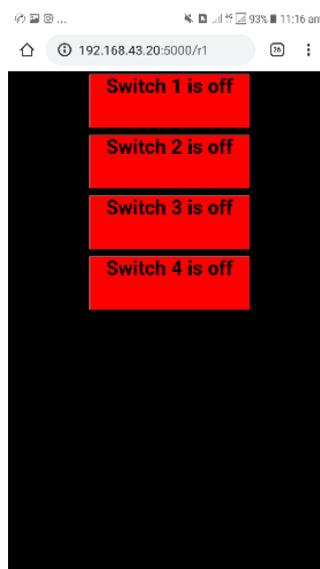
Web Interface on mobile browser.

6. Troubleshooting :

If the web interface don't load after 15 seconds, then instead of type the alternative address to the web interface which is ***http://<IP address to the device>:5000***

To find The IP address:
- Follow the https://www.techrepublic.com/blog/five-apps/five-android-net-scanning-tools-for-mobile-troubleshooting/
- Find the device name "raspberrypi".

7. Videos :
- **Theoretical Proof :** https://youtu.be/LdHDwd8LG-M
- **Real life Application:** https://youtu.be/69CYUbtn7rE