Lora esp8266 Arduino project using Google assistant or Alexa

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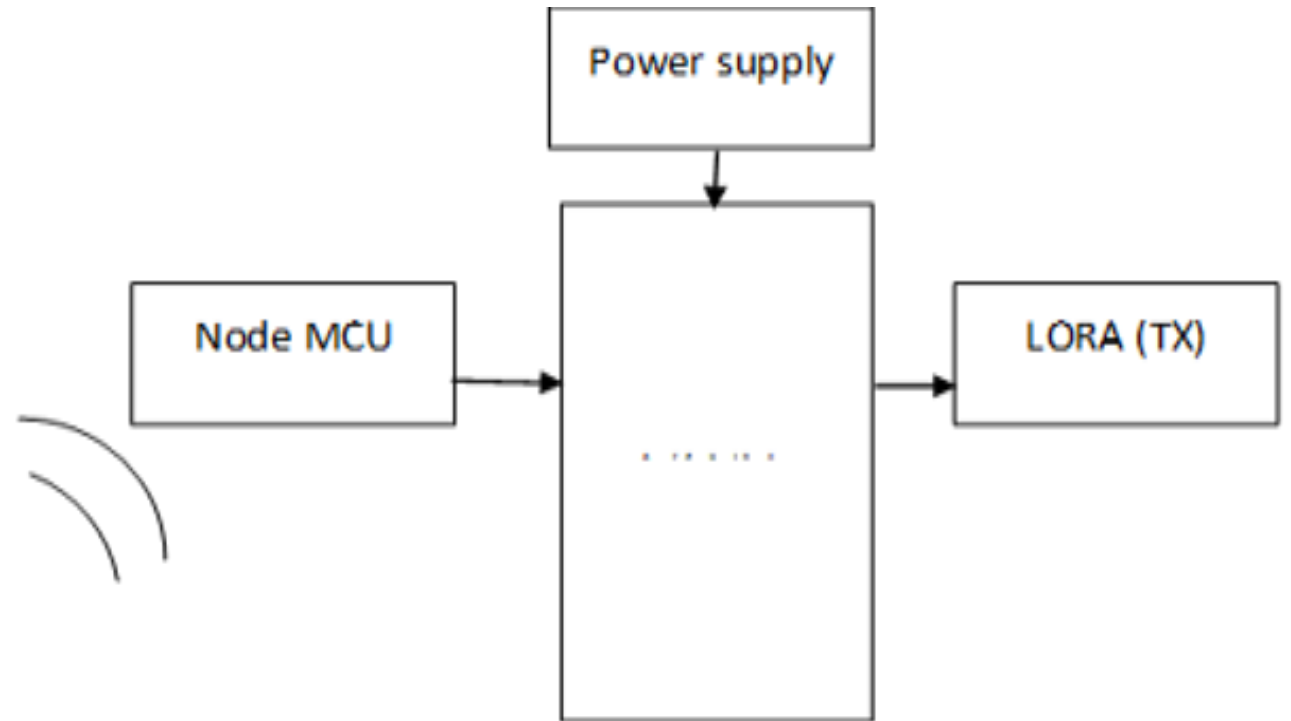- CHANDANA A T - 20201CSE0820

Abstract

- This project explores the integration of Long Range (Lo Ra) communication technology with the ESP8266 microcontroller, enabling a smart home system controlled by voice commands through popular voice assistants like Google Assistant or Alexa. The ESP8266, equipped with Lo Ra transceiver modules, serves as a low-power, long-range communication bridge for smart devices within the home

- The key components of the project include Lo Ra-enabled sensors/devices, an ESP8266 microcontroller, and a central hub. The sensors/devices collect data related to the smart home environment, such as temperature, humidity, and door/window status, and transmit this information to the central hub using Lo Ra communication.
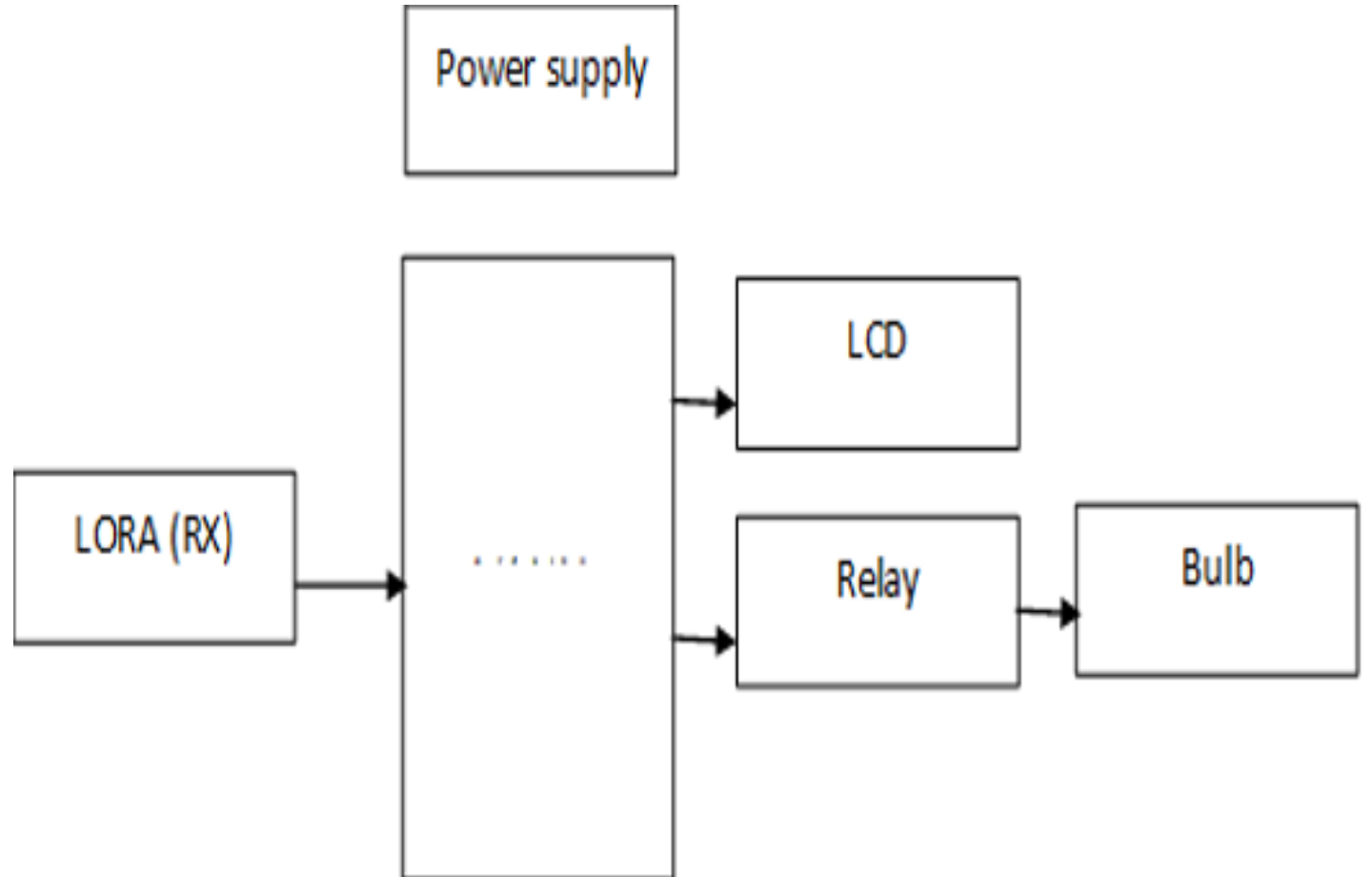
INTRODUCTION

- Home, it is where one likes or wants to be following a long tiring day. Individuals return home depleted following a long dedicated day. Home automation is also named as domestics or Smart home. It incorporates the manage plus automation of light, warming, ventilation, cooling and security, similarly as home appliances. Wi-Fi will be most preferred for remote monitoring and control. Even now when technology is handy enough only the well to do people of the society are blessed with the new smart home devices such as Amazon Echo, Google Home etc, as these devices costs are a bit high. However, not everyone is wealthy enough to be able to afford a human assistant, or some smart home kit. Hence, the need for finding an inexpensive and smart assistant for normal families keep growing.

- This project proposes a very inexpensive system. It uses the Google Assistant, and the Node MCU esp8266 Wi-Fi microcontroller, as the major components along with a relay and other driver boards. All of the components are connected over the internet using Wi-Fi which puts this system under the IOT

Block diagram (TX)

Power supply

Node MCU

LORA (TX)

BLOCK DIAGRAM(RX)

Power supply

LORA (RX)

LCD

Relay

Bulb

COMPONENTS :

ARDUINO   LCD

LORA

RELAY

BULB

NODE MCU

ARDUINO IDE

Upload Sketch to Arduino

Open Serial Monitor

Verify

Coding Area

Debugging Console

ARCHITECTURE

230V AC supply

antenna

FE_SRly

fritzing
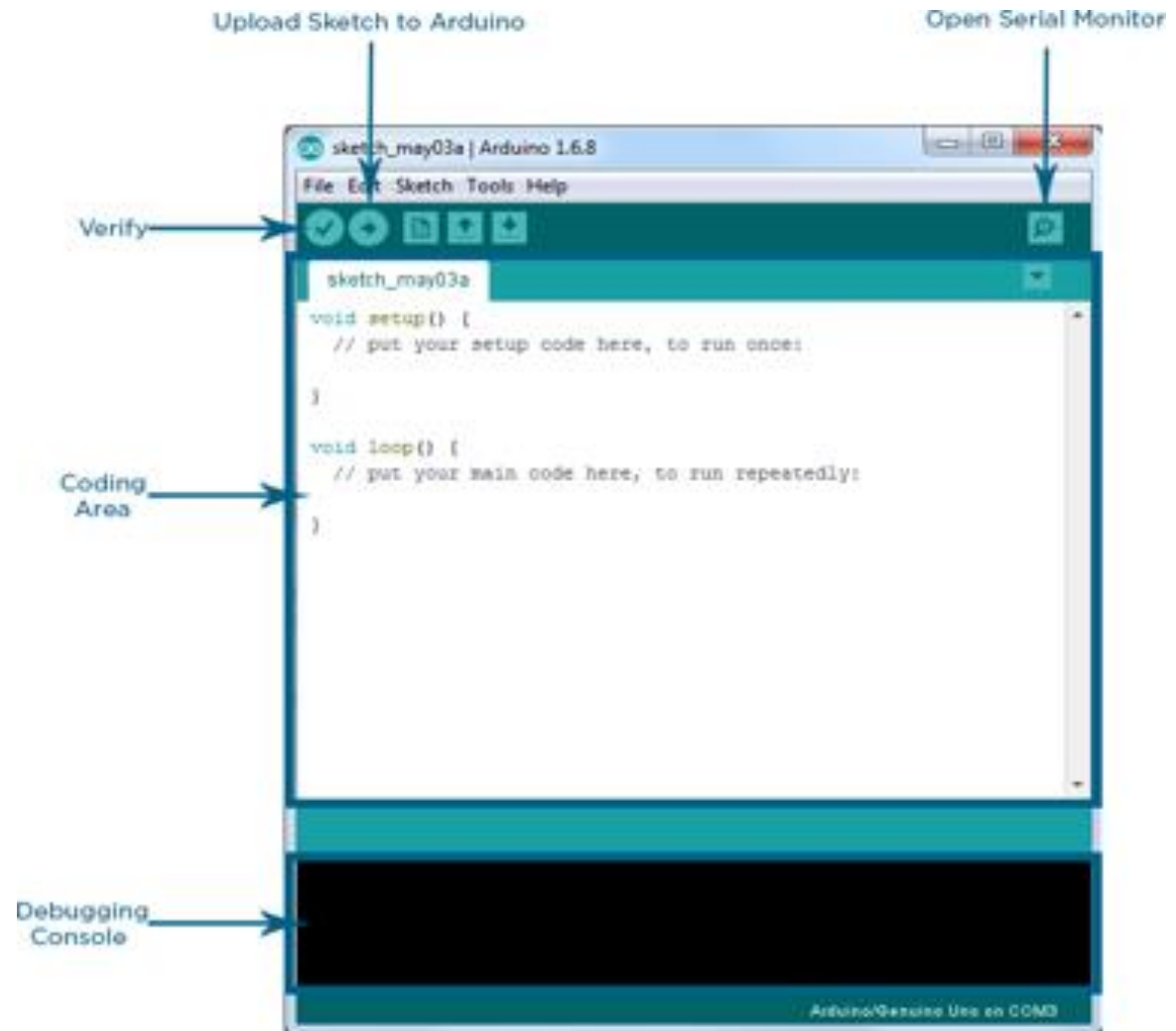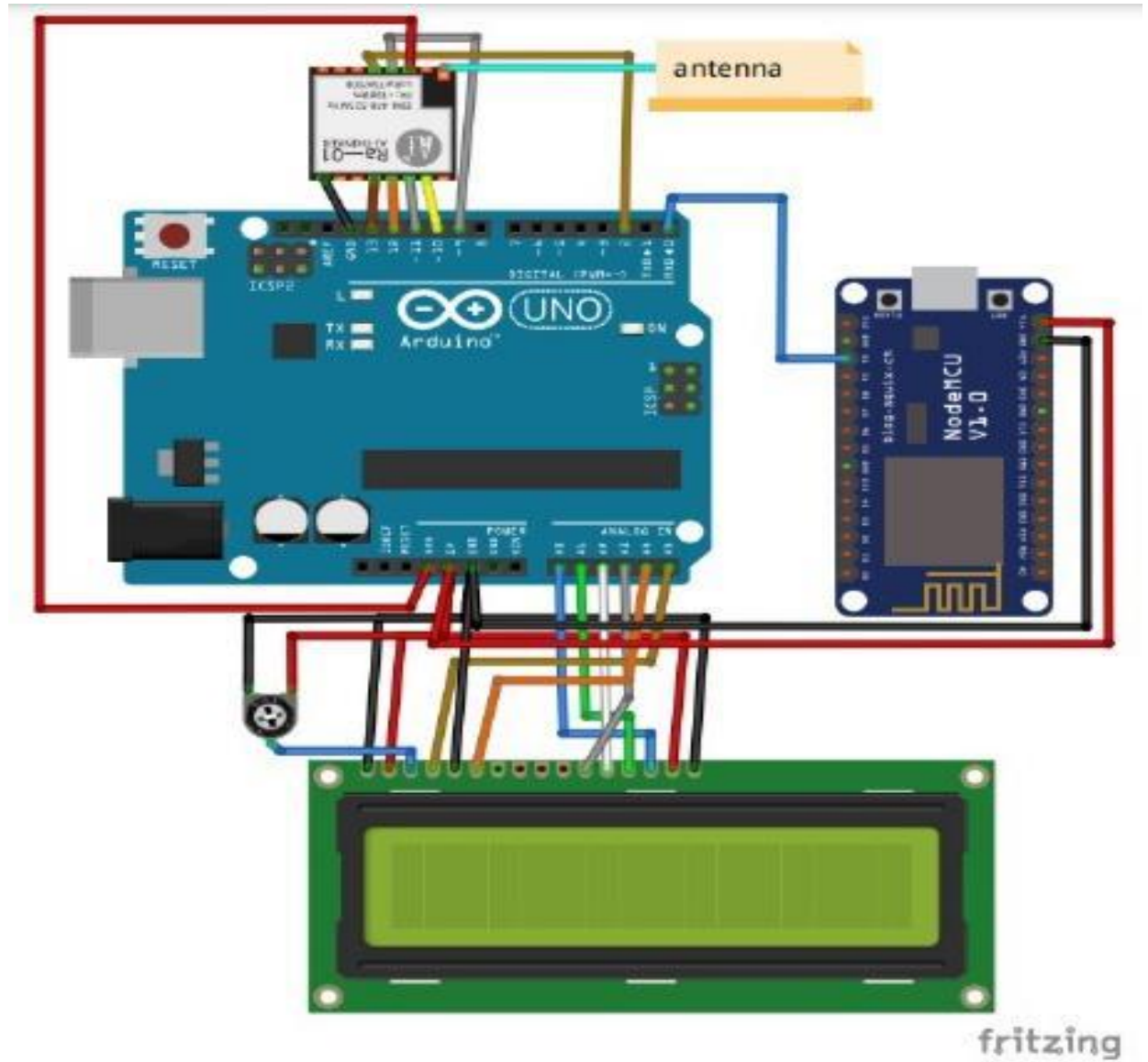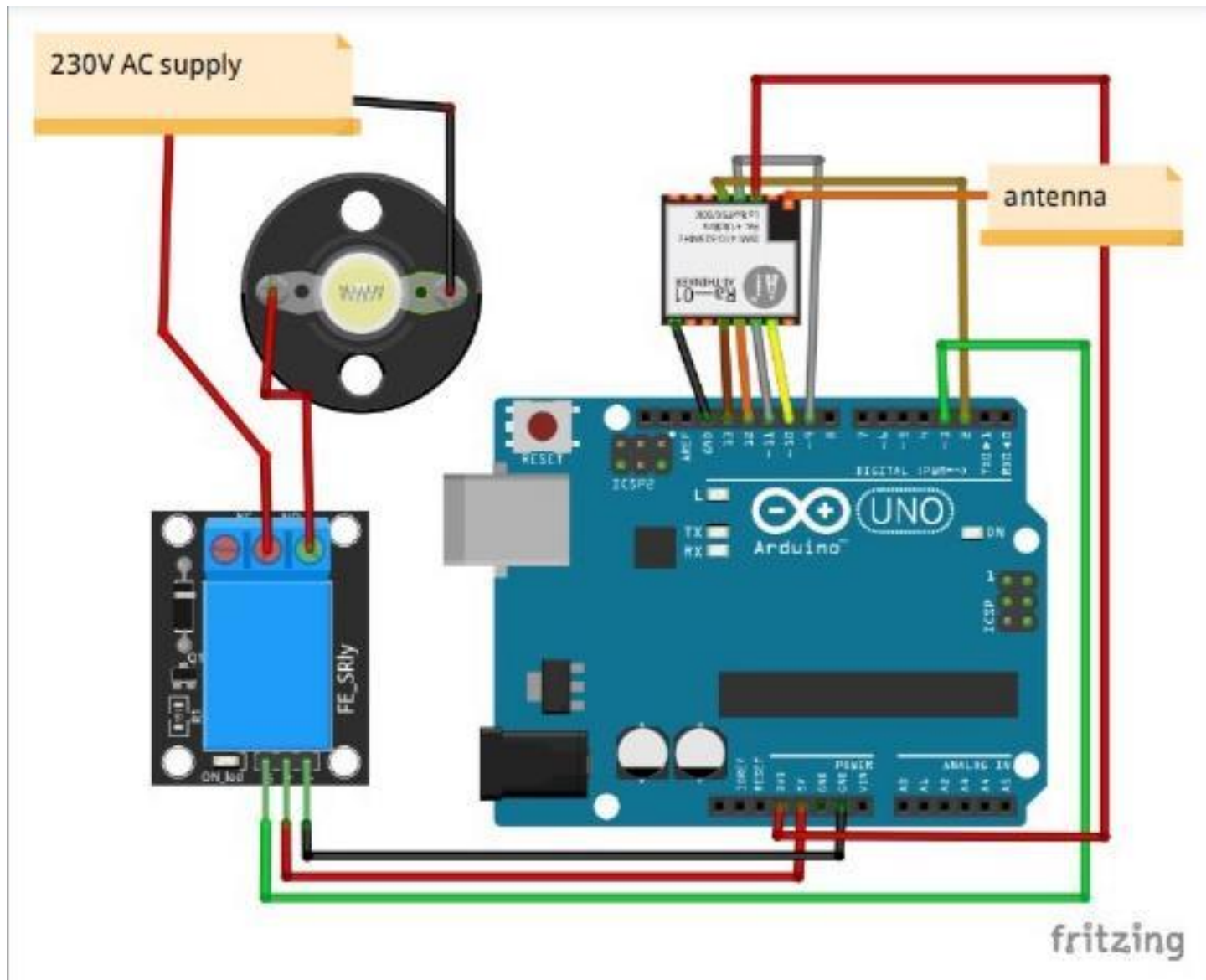
➢ ADVANTAGES

➢ Smart and secure.

➢ Controlling home appliances from anywhere in the world.

➢ There is no need for extra training of that person who is using it.

➢ It is a robust and easy to use system.

➢ APPLICATIONS

➢ Used in homes, offices, industrial areas etc.,

➢ Control home electrical system using phone.

➢ Switch Module's outputs to directly drive loads like bulbs, Lamps, Sockets, Television, and Fans etc.

CODE:

```cpp
#include <SPI.h>
#include <LoRa.h>
#include <LiquidCrystal.h>

const int rs = A5, en = A4, d4 = A3, d5 = A2, d6 = A1, d7 = A0;
LiquidCrystal lcd(rs, en, d4, d5, d6, d7);
void setup() {
 Serial.begin(9600);

 lcd.begin(16, 2);
 lcd.clear();
 lcd.print("Home automation");
 lcd.setCursor(0, 1);
 lcd.print("using LoRa");
 delay(2000);
```

```
while (!Serial)
 ;
Serial.println("LoRa Sender");
if (!LoRa.begin(433E6)) {  // or 915E6, the MHz speed of yout module
Serial.println("Starting LoRa failed!");
lcd.clear();
lcd.print("LoRa failed!");
while (1)
;
}
}
void loop() {
  while (Serial.available() > 0) {
    String data = Serial.readString();
    // Serial.print("data : ");
    int node = data.toInt();
```

```
 if (node == 1)
{
Serial.println(node);
LoRa.beginPacket();
LoRa.print(node);
LoRa.endPacket();
delay(50);
lcd.clear();
lcd.setCursor(3, 0);
lcd.print("Light OFF");
delay(1000);
}
 if (node == 0) {
Serial.println(node);
LoRa.beginPacket();
LoRa.print(node);
```

```
LoRa.endPacket();
delay(50);
lcd.clear();
lcd.setCursor(3, 1);
lcd.print("Light ON");
delay(1000);
}
}
}
```

```
#include <SPI.h>
#include <LoRa.h>
int LED = 3;
String inString = "";    // string to hold input
int val = 0;

void setup() {
 Serial.begin(9600);
pinMode(LED,OUTPUT);
while (!Serial);
Serial.println("LoRa Receiver");
if (!LoRa.begin(433E6)) { // or 915E6
Serial.println("Starting LoRa failed!");
while (1);
}
}
```

```
void loop() {
int packetSize = LoRa.parsePacket();
if (packetSize) {
while (LoRa.available())
{
int inChar = LoRa.read();
inString += (char)inChar;
val = inString.toInt();
}
inString = "";
LoRa.packetRssi();
}
Serial.println(val);
digitalWrite(LED, val);
}
```

```cpp
#include <ESP8266WiFi.h>
#include "AdafruitIO_WiFi.h"
#define LED_PIN LED_BUILTIN
char ssid[] = "Lora";   // Your Network SSID
char pass[] = "123456789";      // Your Network Password
#define IO_USERNAME    "Nafisa"
#define IO_KEY        "aio_mIhV65nnqBDTm0xYUADviKdEO4Lj"
AdafruitIO_WiFi io(IO_USERNAME, IO_KEY, ssid, pass);
AdafruitIO_Feed *LoRa = io.feed("LoRa");
void setup()
{
pinMode(LED_PIN, OUTPUT);
Serial.begin(9600);
while(! Serial);
 Serial.print("\nConnecting to Adafruit IO");
 io.connect();
```

```
LoRa->onMessage(handleMessage);
 while(io.status() < AIO_CONNECTED)
{
Serial.print(".");
 delay(500);
 }
 Serial.println();
Serial.println(io.statusText());
 LoRa->get();
}
void loop()
{
 io.run();
}
```

```
void handleMessage(AdafruitIO_Data *data)
{
f(data->toPinLevel() == HIGH)
Serial.println("1");
if(data->toPinLevel() == LOW)
Serial.println("0");
digitalWrite(LED_PIN, data->toPinLevel());
}
```

CONCLUSION

- The main aim of this project was to propose a considerably cost effective voice controlled (Google Assistant) home automation controlling generally all kind of home appliances found at home. The home automation utilizing IOT has been experimentally demonstrated to work attractive by connecting simple appliances to it and the appliances were effectively controlled remotely through internet using voice commands. This will help the users to monitor the condition of various home parameters in the home anytime anywhere.

REFERENCE

1. NodeMCU:https://nodemcu.readthedocs.io/en/master https://iotbytes.wordpress.com/nodemcupinout/

2. GoogleAssistant: https://assistant.google.com/intl/en_in/ [4]IoT:https://internetofthingsagenda.techtarget.com/def inition/IoT-device

3. Arduino IDE: https://www.arduino.cc/en/Guide/Environment

4. Alkar, A. Z., & Buhur, U. (2005). An Internet Based Wireless Home Automation System for Multifunctional Devices. IEEE Consumer Electronics.

5. Piyare, R. and Tazil, M. (2011) Bluetooth Based Home Automation System Using Cell Phone. IEEE 15th