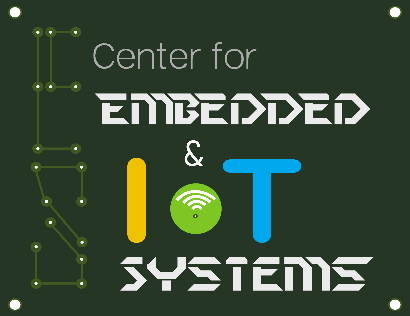
**SMART KITCHEN**



A project report submitted in partial fulfilment of requirement for the course

On

## Fundamentals of IoT

By

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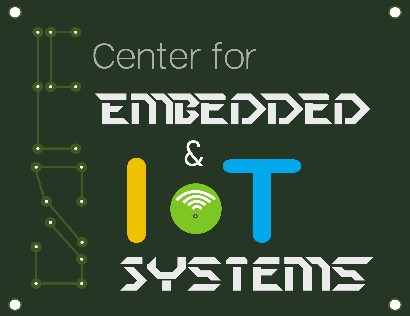
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**CERTIFICATE**

This is to certify that the course project entitled **“SMART KITCHEN”** is the bonafied work carried out by AMITH RAO (**2003A51116**), SPOORTHI (**2003A51248**), SUKRUTHA (**2003A51262**) and CHETHANA **(2003A51275** ) in the partial fulfilment of the requirement for the award of course Internet of Things during the academic year 2022-2023 under our guidance and Supervision.

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# ABSTRACT

Gas leakages results a serious problem in household and other areas where household gas is used regularly, therefore the proposed gas leakage detection and monitoring system is developed.

The main motto of this project is to make a prototype of an IoT Based Smart Kitchen using the Internet of Things, will be a great help to the people in their day-to-day life in terms of preventing any danger caused by gas and fire leakage.

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# INTRODUCTION

IoT has changed the life of human beings. Enormous increase in users of Internet and modifications on the internetworking technologies enable networking of everyday objects. Our project (SMART KITCHEN) detects gas as a part of the safety system. If there is LPG detection an alert (telegram notification) will inform the authorized user about the gas leakage in order to prevent any harmful effects due to gas leakage and an exhaust fan will be on when gas is detected. When the temperature is high in kitchen, it gives an alert and buzzer sound to the user.

# 2.SYSTEM DESCRIPTION

The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino hardware to upload programs and communicate with them (sensors, objects, internet software, board etc.)

****

Arduino Software (IDE)

2.1. BLOCK DIAGRAM

**ESP32**

LITHIUM ION

BATTERIES

# 3.HARDWARE AND SOFTWARE TOOLS

# Software Tools:

Telegram is a globally accessible encrypted, free using software, cloud-based and centralized instant messaging (IM) service. Telegram can be linked to IOT by creating a BOT in our telegram account; it generates a token and that should be placed in our code to get notifications.



Steps for creating a BOT in Telegram:

* Install telegram app from play store.
* Search for BotFather and send message /start.
* After /start now send /newbot as message and choose a name to your bot.
* Now create your username (i.e., you can place your project name).
* After successful creation you will get a token number (NOTE: please store the token number secure and don’t share your token number).
* Search for IDBot and type /getid, then you will get a 10-digit number as your chat ID.
* Add token and chatID to your code to receive telegram notifications.

Hardware Tools:

* Bread board
* MQ2
* DHT11
* ESP32
* Buzzer
* L298N
* Dc Motor
* Jump wires
* LCD (Liquid Crystal Display)
* Lithium-ion batteries

**MQ-2 Sensor**

The MQ-2 is a smoke and combustible gas sensor. It can detect flammable gas in a range of 300 - 10000ppm.

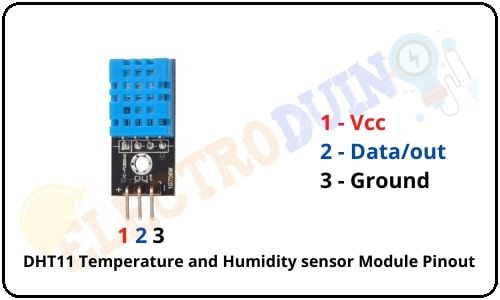


Features:

* Operating Voltage is +5V
* Can be used to Measure or detect LPG, Alcohol, Propane, Hydrogen, CO and methane
* Analog output voltage: 0V to 5V, Digital Output Voltage: 0V or 5V
* Digital Output Voltage: 0V or 5V
* Preheat duration 20 seconds
* Can be used as a Digital or analog sensor
* The Sensitivity of Digital pin can be varied using the potentiometer

**DHT11 Sensor**

DHT stands for Digital Humidity and Temperature series 11. The DHT11 is a basic, ultra-low-cost digital temperature and humidity sensor. It uses a capacitive humidity sensor and a thermistor to measure the surrounding air and spits out a digital signal on the data pin (no analog input pins needed).

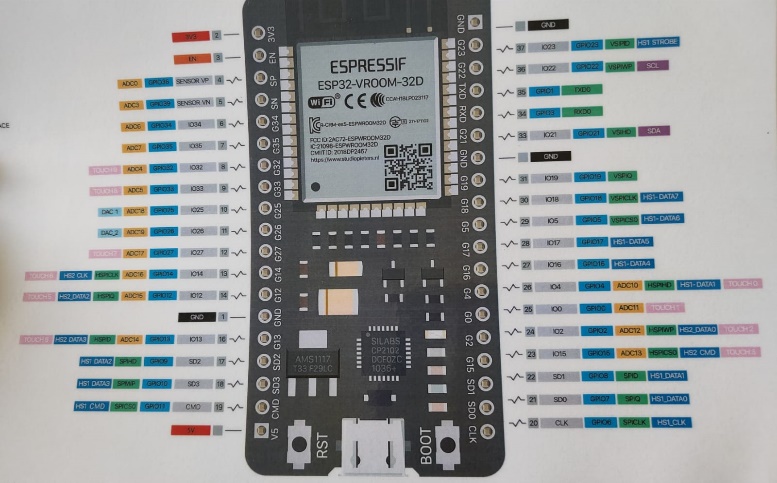


Features:

* Operating Voltage: 3.5V to 5.5V.
* Operating current: 0.3mA (measuring) 60uA (standby)
* Output: Serial data.
* Temperature Range: 0°C to 50°C.
* Humidity Range: 20% to 90%
* Resolution: Temperature and Humidity both are 16-bit.
* Accuracy: ±1°C and ±1%

**ESP32**

ESP32 is a series of low-cost, low-power system on a chip microcontroller with integrated Wi-Fi and dual-mode Bluetooth.

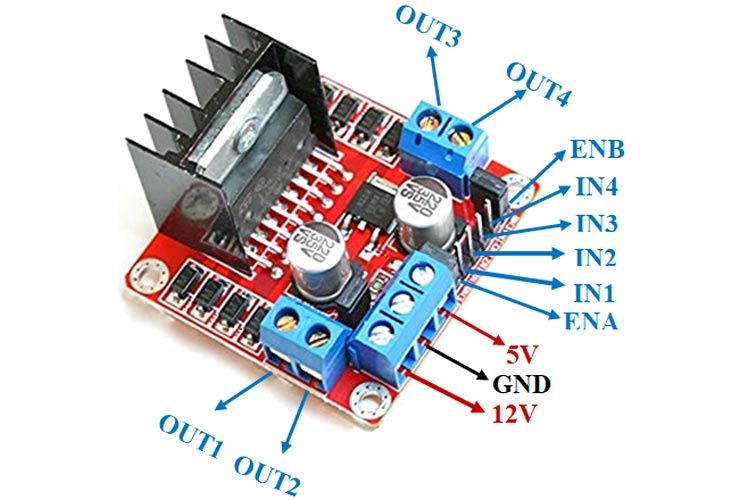


Features:

* Wi-Fi: 802.11 b/g/n
* Bluetooth: v4.2 BR/EDR and BLE (shares the radio with Wi-Fi)
* Memory: 320 KiB RAM, 448 KiB ROM
* 32-bit LX6 microprocessor, operating at 160 or 240 MHz
* Operating temperature ranging from –40°C to +125°C.

**L298N**

The L298N is a dual H-Bridge motor driver which allows speed and direction control of two DC motors at the same time. The module can drive DC motors that have voltages between 5 and 35V, with a peak current up to 2A. It is used to connect DC motor and ESP32.



Features:

* Built-in stabilivolt tube 78M05 can be used to obtain 5v from the power supply.
* High-Voltage and Current full-bridge driver with 2 H-bridges used to drive inductive loads like DC and Stepper Motors. Supply range is 5V to 35V.

**DC Motor**

DC motors are motors that operate on Direct Current (DC). A DC motor is an electrical machine that converts electrical energy into mechanical energy. In a DC motor, the input electrical energy is the direct current which is transformed into the mechanical rotation.



Features:

* Runs on DC power or AC line voltage with a rectifier
* Operating speeds of 1,000 to 5,000 rpm
* 60-75% efficiency rate
* High starting torque

**LCD (Liquid Crystal Display)**



**Buzzer**



# 4.IMPLEMENTATION

# 

# 

Source code:

//Add DHT sensor library

//Add Universal Arduino Telegram Bot

//Install Arduino Json

#include <Wire.h>

#include "DHT.h"

DHT dht(13, DHT11);

#include <LiquidCrystal.h>

LiquidCrystal lcd(14, 27, 26, 25, 33, 32);

#include <WiFi.h>

#include <WiFiClientSecure.h>

#include <UniversalTelegramBot.h>

#include <ArduinoJson.h>

// Place your network details

const char\* ssid = "kitchen";

const char\* password = "12345678";

// Initialize Telegram BOT

#define BOTtoken "5721238020:AAEhluM7VgBaq3EyWmI5\_YHsMcymsOMBHcE"

#define CHAT\_ID "5757055741"

WiFiClientSecure client;

UniversalTelegramBot bot(BOTtoken, client);

#define gas 35

#define buzzer 19

#define motor 23

void setup() {

pinMode(buzzer, OUTPUT);

pinMode(gas, INPUT);

pinMode(motor, OUTPUT);

Serial.begin(9600);

dht.begin();

WiFi.mode(WIFI\_STA);

WiFi.begin(ssid, password);

client.setCACert(TELEGRAM\_CERTIFICATE\_ROOT);

while (WiFi.status() != WL\_CONNECTED) {

Serial.print(".");

delay(500);

}

bot.sendMessage(CHAT\_ID, "Bot started up", "");

lcd.begin(16, 2);

lcd.setCursor(0, 0);

lcd.print("SMART KITCHEN ");

lcd.setCursor(0, 1);

lcd.print(" ");

delay(5000);

lcd.clear();

}

void loop() {

lcd.clear();

float T = dht.readTemperature();

if (T > 45) {

bot.sendMessage(CHAT\_ID, "Alert!!High Temperature.", "");

lcd.setCursor(0, 0);

lcd.print("High Temperature");

lcd.setCursor(0, 1);

lcd.print(" ");

digitalWrite(buzzer, HIGH);

delay(1000);

digitalWrite(buzzer, LOW);

if (digitalRead(gas) == LOW) {

bot.sendMessage(CHAT\_ID, "Alert!! Gas detected, FAN On", "");

lcd.setCursor(0, 0);

lcd.print("Gas Detected ");

lcd.setCursor(0, 1);

lcd.print("Fan ON ");

digitalWrite(motor, HIGH);

digitalWrite(buzzer, HIGH);

delay(1000);

digitalWrite(buzzer, LOW);

}

} else if (digitalRead(gas) == LOW) {

bot.sendMessage(CHAT\_ID, "Alert!! Gas detected, FAN On", "");

lcd.setCursor(0, 0);

lcd.print("Gas Detected ");

lcd.setCursor(0, 1);

lcd.print("Fan ON ");

digitalWrite(motor, HIGH);

digitalWrite(buzzer, HIGH);

delay(1000);

digitalWrite(buzzer, LOW);

}

else {

{

digitalWrite(motor, LOW);

}

}

delay(1000);

}

# 5.RESULT

# This can help in avoiding disaster when gas is leaked.

# When ESP32 is connected to WIFI we get a notification that bot is started and when gas is detected it gives a message that gas is detected and when temperature is high it gives a message that temperature is high notification.

# 

# 

# 

# 

# 6.CONCLUSION

This is a real time equipment-setup where people can know the gas leakage and temperature of their kitchen from anywhere, they are; through internet. so, it is easy technique to monitor the domestic gas leakage.

# 7.REFERENCES

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