# KARNATAK LAW SOCIETY’S GOGTE INSTITUTE OF TECHNOLOGY

UDYAMBAG, BELGAVI-590008

(An Autonomous Institution under Visvesvaraya Technological University Belagavi)

## (APPROVED BY AICTE, NEW DELHI)



Course Activity on

## “SMART PARKING SYSTEM USING IOT”

*submitted in the partial fulfilment for the academic requirement of*

## 6th Semester BE in

**SENSORS AND SIGNAL CONDITIONING**

Submitted by

|  |  |
| --- | --- |
| **NAME OF THE CANDIDATE** | **USN** |
| Aishwarya Bhavikatti | 2GI20EC013 |
| Anusha Mathad | 2GI20EC023 |
| Anvita Savadi | 2GI20EC025 |
| Labdhi Oswal | 2GI20EC059 |

## GUIDED BY

**Prof. Praveen Kalkundri**

**KARNATAK LAW SOCIETY’S**

**GOGTE INSTITUTE OF TECHNOLOGY** **UDYAMBAG,**

**BELAGAVI – 590008**

(An Autonomous Institution under Visvesvaraya Technological University, Belagavi)

## (APPROVED BY AICTE, NEW DELHI)

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**



**CERTIFICATE**

This is to certify that Aishwarya B, Anusha M, Anvita S, Labdhi O of **6th Semester** bearing **USN:2GI20EC013,2GI20EC023,2GI20EC025,2GI20EC059** has satisfactorily completed the course activity  *on Sensors and Signal Conditioning*. It can be considered as a bonafide work carried out for partial fulfilment of the academic requirement of 6th Semester B.E. prescribed by KLS Gogte Institute of Technology, Belagavi during the academic year 2022-23.

The report has been approved as it satisfies the academic requirements prescribedfor the said degree.

Signature of the Faculty Member Signature of the HOD

Date:

**SOURCE CODE:**

**For Arduino sensor:**

#include <Arduino.h>

#define ECHOpin 3

#define TRIGpin 2

long duration;

int distance;

int count=0;

float car1;

int x;

int total=0,timer\_cnt=0;

long Time\_1,Time\_2;

float distanceCM\_1 = 0,resultCM\_1 = 0;

float Dist1=8.0;

void setup()

{

Serial.begin(9600); // // Serial Communication at the rate of 9600 bps

pinMode(TRIGpin, OUTPUT); // It sets the ECHO pin as OUTPUT

pinMode(ECHOpin, INPUT); // It sets the TRIG pin as INPUT

Serial.println("------------------Welcome to SMART PARKING SYSTEM----------------"); // It will appear on Serial Monitor

}

void loop()

{

total=0;

car1=sensor1();

if(car1<=Dist1)

{

Serial.println("Car1 is present");

}

else{

total+=1;

}

if (timer\_cnt >=20)

{

Serial.print('\*');

// Serial.print("Total number of Empty Spots:");

Serial.print(total);

Serial.println('#');

timer\_cnt = 0;

}

timer\_cnt += 1;

delay(200);

}

float sensor1(void)

{

digitalWrite(TRIGpin, HIGH);

delayMicroseconds(10);

digitalWrite(TRIGpin, LOW);

Time\_1 = pulseIn(ECHOpin, HIGH);

distanceCM\_1 = Time\_1 \* 0.034;

return resultCM\_1 = distanceCM\_1 / 2;

}

//specified unit of distance

**FOR WIFI Connection using nodeMCU:**

#include "ThingSpeak.h"

#include <ESP8266WiFi.h>

//------- WI-FI details ----------//

char ssid[] = "ANU"; //SSID here

char pass[] = "anuabhishek"; // Password here

//--------------------------------//

//----------- Channel details ----------------//

unsigned long Channel\_ID =2206999; // Your Channel ID

const char \* myWriteAPIKey = "1GJLO10D1AUPRMRI"; //Your write API key

//-------------------------------------------//

const int Field\_Number\_1 = 1;

String value = "";

int value\_1;

WiFiClient client;

void setup()

{

Serial.begin(115200);

WiFi.mode(WIFI\_STA);

ThingSpeak.begin(client);

internet();

}

void loop()

{

internet();

if (Serial.available() > 0)

{

delay(100);

while (Serial.available() > 0)

{

value = Serial.readString();

if (value[0] == '\*' )

{

if (value[2] == '#')

{

value\_1 = value[1] ;

}

}

}

}

upload();

}

void internet()

{

if (WiFi.status() != WL\_CONNECTED)

{

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

{

WiFi.begin(ssid, pass);

delay(5000);

}

}

}

void upload()

{

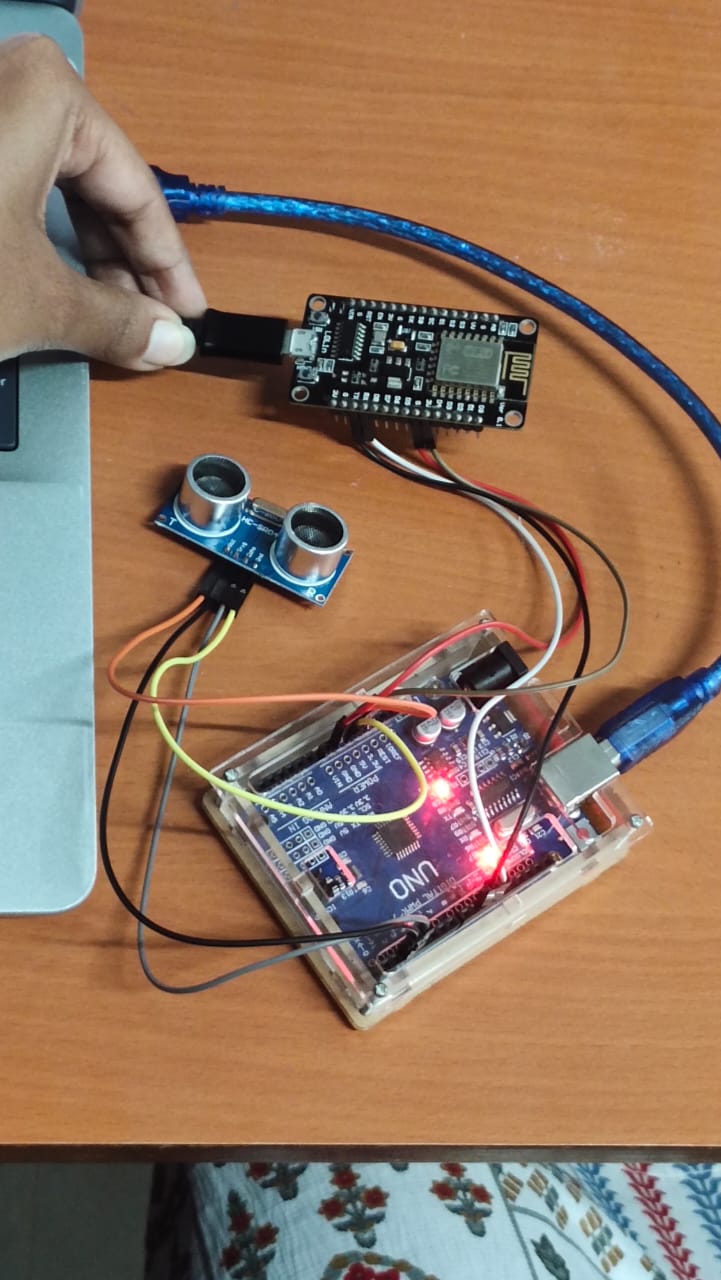
ThingSpeak.writeField(Channel\_ID, Field\_Number\_1, value\_1, myWriteAPIKey);

delay(15000);

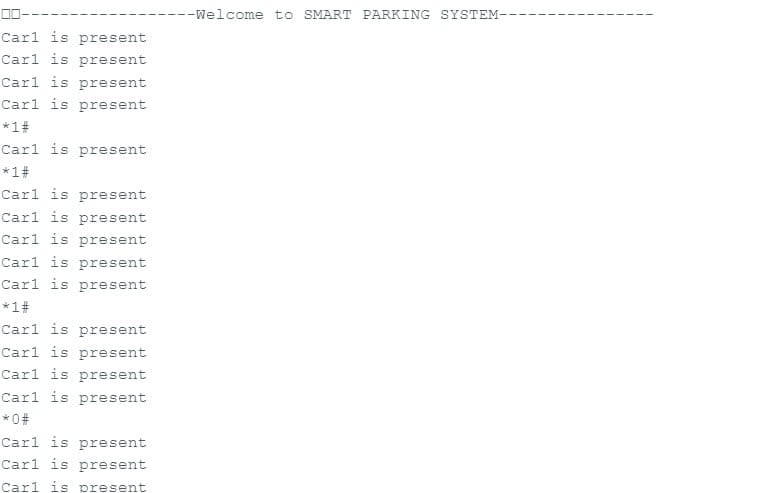
value = "";

}

**CIRCUIT SETUP:**

****

**OUTPUT:**

****

**APPLICATION:**

The application of a smart parking system using IoT (Internet of Things) technology involves the use of connected devices and sensors to monitor and manage parking spaces efficiently. Here's an overview of how a smart parking system using IoT can be implemented:

1. Parking Availability Information: Utilize a user interface, such as a mobile app or digital signage, to display real-time parking availability information to drivers. This information helps drivers locate and navigate to the nearest available parking space, reducing the time spent searching for parking.

2. Reservation and Payment: Implement a reservation system that allows users to reserve parking spaces in advance. This can be done through the mobile app or a dedicated website. Additionally, integrate a payment gateway to enable users to make payments for their parking usage, either through the app or other payment methods.

3. Smart Parking Management: The central server collects and analyzes parking occupancy data to optimize parking management. It can generate reports on parking utilization, peak hours, and trends, allowing authorities or parking operators to make informed decisions regarding pricing, allocation, and infrastructure improvements.

4. Integration with Navigation Systems: Integrate the smart parking system with navigation systems or mapping applications. This enables drivers to access real-time parking availability information and receive directions to the nearest available parking space.

5. Urban Parking Management: Smart parking systems can be implemented in urban areas to efficiently manage parking spaces. By monitoring occupancy in real-time and providing availability information to drivers, the system reduces congestion and helps drivers quickly find parking spaces, minimizing traffic and frustration.

6. Shopping Malls and Retail Centers: Smart parking systems can be deployed in shopping malls and retail centers to streamline parking operations. The system can provide real-time parking availability to shoppers, enabling them to navigate to available parking spaces effortlessly. It also facilitates efficient parking management for mall operators.

7. Airport Parking: Airports often face challenges with parking management due to the large number of vehicles and limited space. Smart parking systems help optimize parking utilization by providing accurate information on available parking spaces and enabling travelers to plan their parking in advance.

8. Campus Parking: Smart parking systems are beneficial for managing parking on university or corporate campuses. By guiding students or employees to available parking spots, the system improves parking efficiency and reduces congestion on campus.

9. Event Venues: During large events, parking can become chaotic. Smart parking systems can help event organizers manage parking by providing real-time parking availability and directing attendees to available parking spaces. This streamlines the parking process and improves the overall experience for event-goers.

Residential Communities: Smart parking systems can be deployed in residential areas to optimize parking allocation and reduce unauthorized parking. By using sensors or license plate recognition, the system can monitor parking spaces and provide residents with real-time information on available parking spots.

10. Government Facilities: Government buildings, municipal offices, and courthouses can benefit from smart parking systems. These systems improve parking management for visitors and employees, ensuring efficient use of available parking spaces.

11. Street Parking: Smart parking systems can be integrated with parking meters or mobile applications to enable real-time monitoring of street parking spaces. Drivers can view available parking spots, pay for parking, and extend parking sessions remotely.

The implementation of a smart parking system using IoT technology offers several benefits, including improved parking efficiency, reduced traffic congestion, optimized space utilization, enhanced user experience, and environmental sustainability by minimizing unnecessary vehicle movement.

Overall, smart parking systems help optimize parking utilization, reduce traffic congestion, and enhance the overall parking experience for drivers. By leveraging technology and real-time data, these systems improve efficiency, reduce search times, and contribute to a more sustainable urban environment.