A Project Report On

# "SMART PARKING SYSTEM"

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# SMART PARKING SYSTEM

## INTRODUCTION

This report is all about the making and working of the mini project chosen i.e., SMART PARKING SYSTEM. This report tries to give a brief overview of the problem statement, motivation for the project, tools used and the Methodology followed to achieve this project.

## PROBLEM STATEMENT

We all know that parking spaces are very important in any city. A city must have enough parking spaces to provide their residents and their visitors a place to park their vehicles. Also, nowadays cars are a main mean of transportation for many, but it's not always easy for a person to find proper parking space in a crowded city. This results in annoying issue for the drivers to park their vehicles as it is very difficult to find a parking slot. The drivers usually waste time and effort in finding parking space and end up parking their vehicles finding a space on streets.

Simply car parking is a major problem in urban areas. Following the rapid increase of car ownership, many cities are suffering with a lack of car parking areas, which can be considered the initial reason for requirement of a proper parking solutions. To deal with the same problem a proper adoption of smart parking is required.

## MOTIVATION FOR PROJECT

I living in Dehradun faced the same problem, whenever I used to visit the heart of city there was always parking issues, police also gave strict orders to the people that not to park their vehicles at side of main roads and due to unviability of proper parking places, people used to disobey the orders of police officials.

In start of year 2019 the UK government passed an order to make smart parking at 21 spots in Dehradun, at the end of 2019 one famous spot at the side of Rajpur Road was inaugurated as a smart parking area (but it was not SMART), the biggest issue that govt faced with the parking was the labour required to control the IN and OUT of vehicles, due to this reason the parking area was just as any free parking area where people parked their vehicles in unorganized way blocking the main road.

But what if no labour must have been required for the parking area? what if the parking must have been automated by the various new technologies available?

Seeing this issue not been solved till date, I was inspired to work on this project, where I wished to cut off the labour requirement and let all working to be done with help of sensor and make the parking system 90% automated.

# TOOLS REQUIRED:

## HARDWARE USED:
➢ ARDUINO UNO
➢ CABLE FOR ARDUINO UNO
➢ IR SENSORS
➢ NODEMCU ESP2866 Wi-Fi MODULE
➢ B-TYPE CABLE FOR WIFI MODULE
➢ BREADBOARD
➢ JUMPER WIRES

## SOFTWARES USED:
➢ ARDUINO IDE
➢ THINGSPEAK (IoT analytics platform)
➢ THINGSHOW (Mobile application of Thingspeak

# **METHODOLOGY:**

In this project we have used NODEMCU ESP8266, which is a microcontroller with Wi-Fi chip, the reason for using this module is because we want our project to be iot based, and want it to provide the details of any free slots available through the thingspeak application to the user directly,

To work on esp2866 module we need to install certain libraries and packages for our module to interact with Arduino ide, we also need to provide some external board management URLs in the preferences, then we will install some Wi-Fi libraries in Arduino ide from the 'sketch' option. Then finally we need to install the board from the 'boards manager' option in our ide.

To test if our board is working or is supported by our ide, we can test some inbuilt sample programs available in our IDE. Now we will be creating a channel in thing speak web application. thing speak provides us with an API key with which we can read and write data from any means and can access it from anywhere in the world.in this project we are using 4 IR sensors which will demonstrate 4 parking slots, in thing speak application we will be creating 4 fields which will switch on/off the green light (Demonstrating that parking slot is empty). Now we will program our Wi-Fi module and connect IR sensors with it. Initially, thingspeak application provides us with some prewritten code which we can use in our code for to send and receive data mainly with the help of API key.

After we program our Wi-Fi module, we need to ensure that our IR sensors are responding properly and our data is being updated in thingspeak application. After uploading the code, our project will be ready.
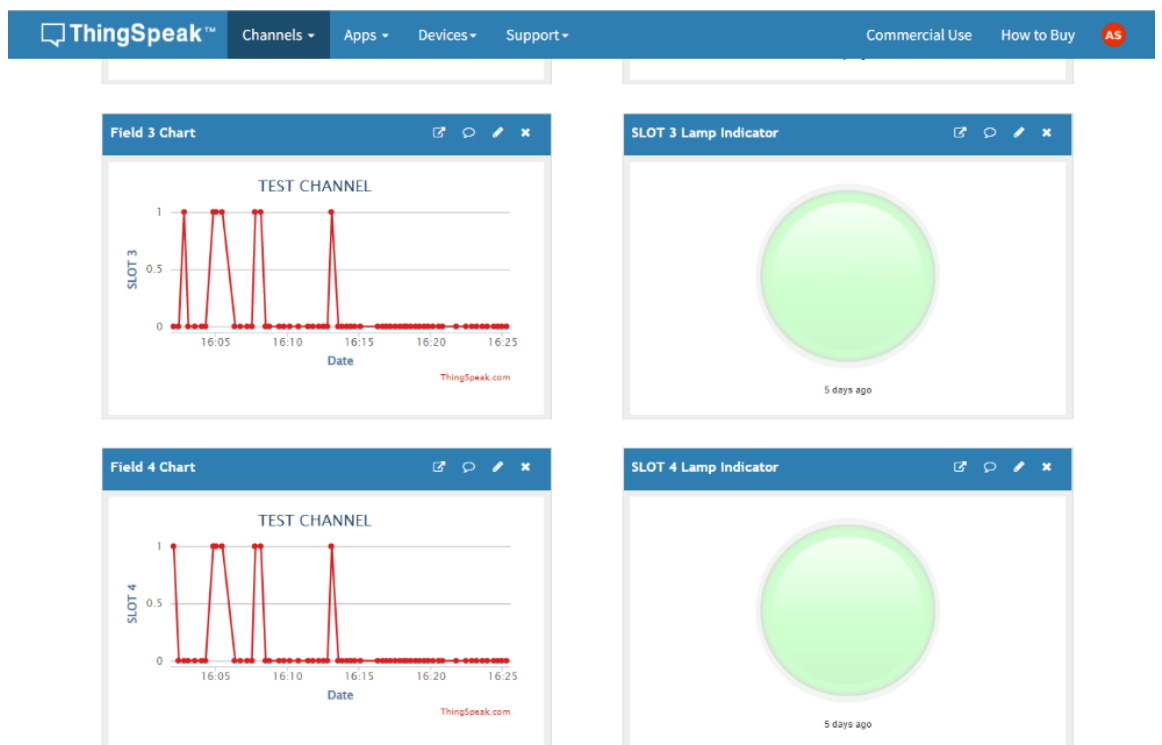
We can now monitor Realtime updates of our smart parking system with the help of thingspeak web software or with thingshow app in mobile. If any slot out of 4 will be empty, then our green LED will switch-ON, indicating that a particular slot is empty.
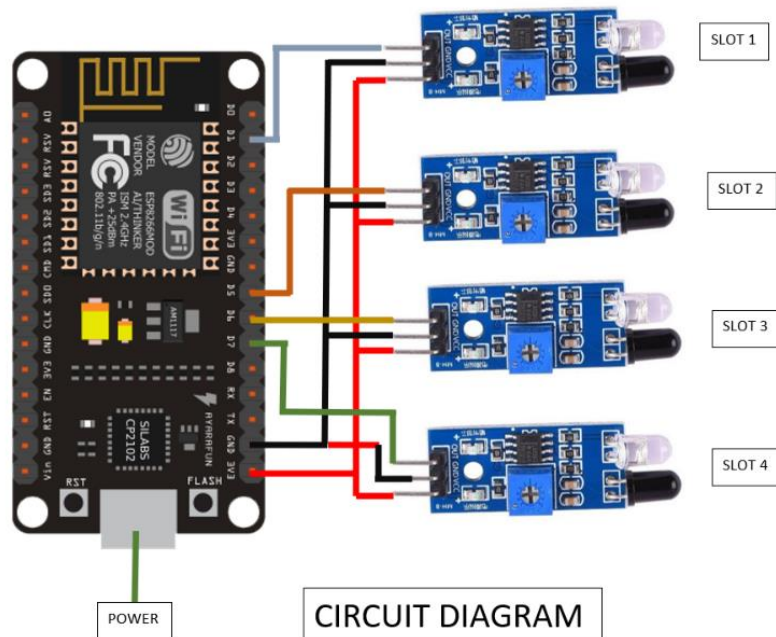
# View in Thingspeak Web Application :

Slots Empty:



Slots Full:

# PIN DIAGRAM:



CIRCUIT DIAGRAM

# APPLICATIONS:

❖ Fully automated system without any human involvement.
❖ Parking facility for several vehicles.
❖ Reduction of traffic congestion.
❖ Reduction of parking violations and suspicious activity.
❖ Reduction of accident caused by distraction of searching for parking.

# REFERENCE:

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❖ www.esp2866.com
❖ www.thingspeak.com
❖ www.google.com
❖ www.circuits4you.com

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