Multilevel Car Parking Monitoring System (M.C.P.M.S)

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Abstract: **When an individual riding his/her Vehicle, visit to a big cities having very rush roads and the area provided for parking is not suitable or it is time consuming. This project is the solution for various people living in big cities to park their car in suitable region, and also provides the empty space for car.**
The indication display will help every vehicle driver to the suitable spot which will help them in low fuel burning and less time consuming.

Index Terms: **Microcontroller, Infrared sensor, 16x2 LCD display, Solar cells etc.**

1. Introduction

Well, this project is an answer to the issue. The system will help in providing the suitable space for the drivers to park their vehicle and the do not have to face the problems while entering the parking area.

In this task, Arduino is the main center body which react to the input when the vehicle is approaching toward it, the IR sensors are connected to the microcontroller and the display is used to inform about the space is empty or full.

An Infrared sensor is used as the main component for the detection of the vehicle, when the vehicle comes in the range of sensor the receiver gets the signal and it inform Arduino about the vehicle .

According to this the driver will be able to see about the empty space and will directly approach to it not wasting time in whole process.

This system will help in various fields and big cities having parking issue, will also help in saving global warming as it will help in low burning of fuels .
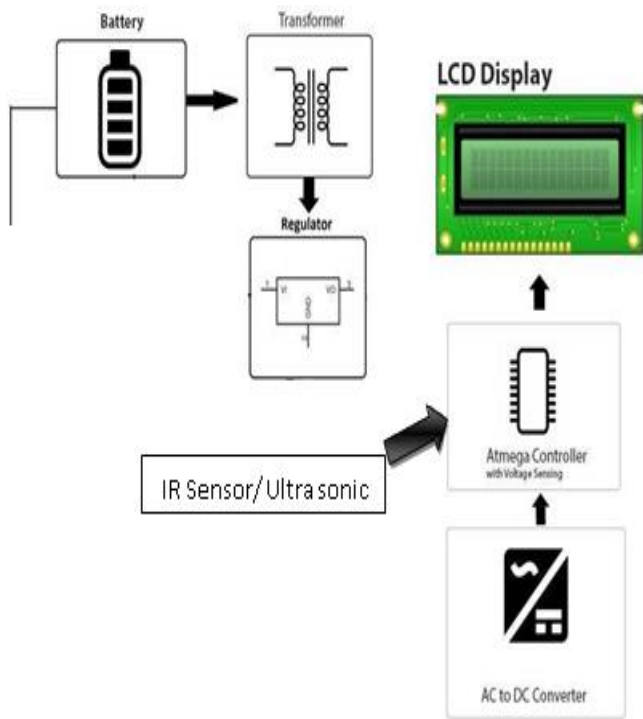
2. Overview

When an individual riding his/her Vehicle, visits to the place having very big parking system the person when enters inside the place faces the problem for parking his/her car and it is very time consuming and high usage of fuel is done .

To get over this issue, this project is made so first we have provided the space for various car parking, the IR sensors are fixed in every block of car parking and it will act as the sender and receiver as we have fixed the range of sensors.

An Arduino is used in which all the IR sensors are connected, the Arduino work as the microcontroller which is used to control the actions of the sensors and pass the output to display it.

According to this project when a vehicle is going in some big malls the area allotted to the parking is too big and if the driver does not know where the empty space is he/she has to waste their time in finding the place or block suitable for their car, We have used the IR sensors which have two sides as sender and receiver and it passes the signal if it collide with the object and received back the it will detect the object , once the object is detected the microcontroller gets the response and it immediately respond to the display the display is located at the entrance of the parking which is visible to the driver driving the vehicle, So the person can get directly to the exact slot or block which is empty without wasting their time and fuel by this process the time consumption will be less.

2.1. Block Diagram of System

Fig. 1. Block Diagram of M.C.P.M.S.

The above figure, contains the block diagram of Multilevel Car Parking Monitoring System, in this block diagram we can see the two parts as one is the part where battery is used to operate the whole function and the another one is when the direct power supply is used to operate the whole system.

This figure can be easily understand by everyone who is new to this the microcontroller is used in which the codes are input and all the IR sensors are well connected to the microcontroller which work as an the heart of the whole system, once the connections are made we can approach directly to the display where the displaying of the blocks are showing the display which is used is 16x2 LCD display.

The display will tell us about whether the block is busy or empty and will easy the work of person.

2.1.1 Infrared Sensor (IR)

An infrared sensor is a type of motion sensor that uses infrared radiation. This sensor have two part one is sender and another is receiver and it is used to detect the object present in front of it.

Fig. 2. Infrared Sensor
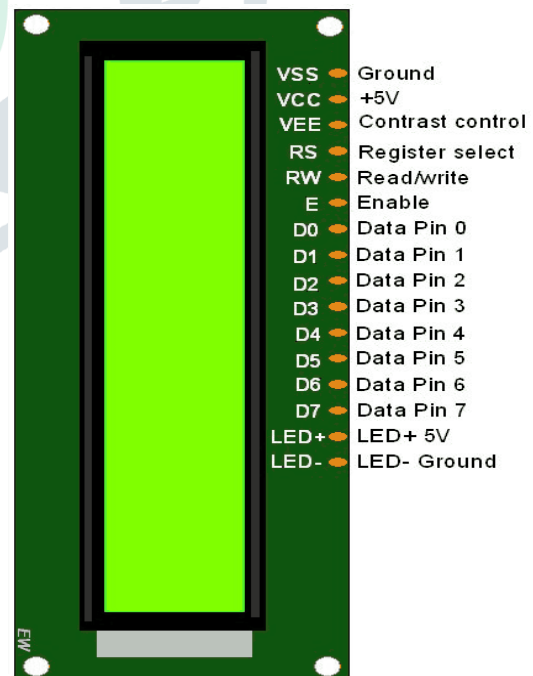
2.1.2 LCD Display

Fig. 2. LCD Display

The LCD display has various applications and is used to display the output of the whole function. The 16x2 LCD display is commonly used in all areas.

2.1.3 Microcontroller

Arduino is a single-board microcontroller meant to make the application more accessible, which are interactive objects and its surroundings. It is based on the microchip ATmega328P microcontroller and developed by Arduino.cc. Current models consist of a USB interface, 6 analog input pins and 14 digital I/O pins that allow the user to attach various extension boards.

Parameters :-

Power Supply: 5V
Analog Pins: 6 Pins (A0-A5)
Input/Output Pins: 14 Digital Pins (0-13)
Serial Pins: 2 Pins (0 Rx, 1 Tx)
PWM Pins: 6 Pins (3, 5, 6, 9,10, 11)
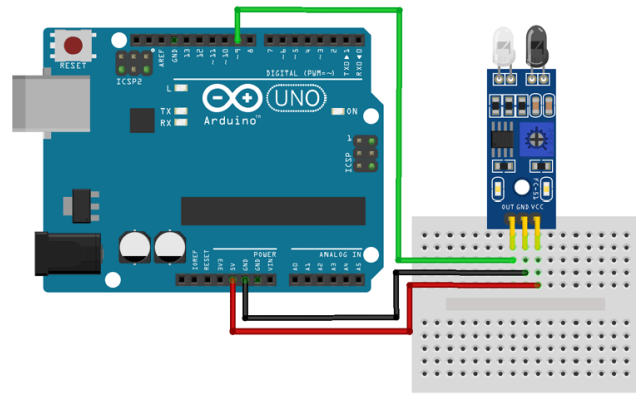
3. Circuit Structure and Implementation

Fig. 5. Circuit Structure of Arduino with IR sensor
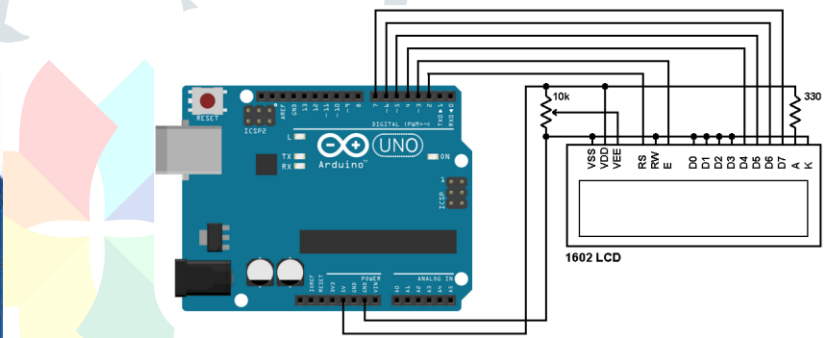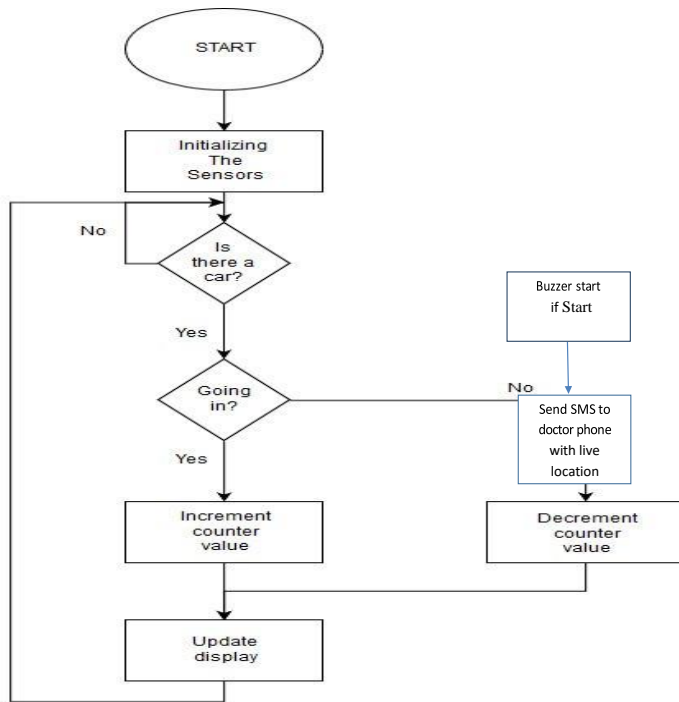

Fig. 4. Arduino UNO

Fig. 6. Circuit Structure of Arduino with LCD Display.

The figure 5 is the connection between the IR sensor and the microcontroller the 5v is required for operating the all components and the sensor also the ground pin is connected.

Figure 6 is the circuit connection between the microcontroller and the LCD display. The pins are connected in the digital part of the Arduino which provide the output to the system and it helps in all data transfer between sensor and display.

4. Flowchart

By increasing the technology, we can also make it solar which will be very eco-friendly as it will consume low power supply.

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8. Conclusion

This system will help in the various fields like in the working profession as well as in the educational profession.

This system will help in the space utilization of the parking lots and help in saving the time.

This will be new method for parking and will provide the great and futuristic experiences for the drivers.

It will also help in the economic saving and as well as in the environment saving process.

5. Advantages

The main advantage of "Multilevel Car Parking Monitoring System" is that it will save the large amount of time and will consume less fuel.

The traffic for the parking will become less, as every slots will be perfectly occupied.

This system is of great use as it will help in reduction of pollution and will be environmental friendly.

6. Disadvantages

We cannot implement this system to small parking as it will consume more electricity, it will lead to be expensive.

Also, we can never get the exact needed amount of vehicle parking slots.

7. Future Development

This system can be used in smart city management places.

This can be very useful for everyone having busy schedule.

9. References

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