



Smart Parking System

[Arduino]



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Project Objectives:

- Designing a system for a smart **Car Parking System** that can allow cars to pass, and don't allow them to pass when the parking is full.
- The **LED** turn on green color when the parking is **Empty**.
- The **LED** turn on red color when the parking is **Full**.
- Display the number of cars entering on the LCD screen.

Project Description:

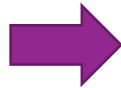
- This project is built using the Arduino Uno, the IR Proximity, and the sensor senses car passage.
- This parking is useful to know the number of free spaces and organizing the parking process.

Software Used:

We have used **Tinker CAD** software to design and implement our system.

Components:

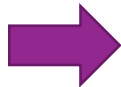
➤ Arduino Uno:



It is the ideal board for getting started with electronics, it has 14 digital input/output pins and 6 analog inputs.

It plays the role of the brain in our project.

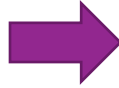
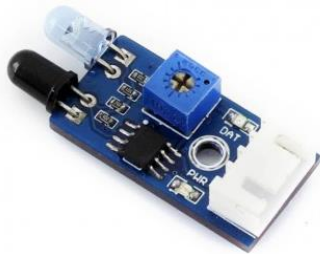
➤ LCD Screen:



LCD 16 *2 with I2c module.

It has used to **display the number** of cars in Parking, and **how many cars have passed**.

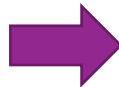
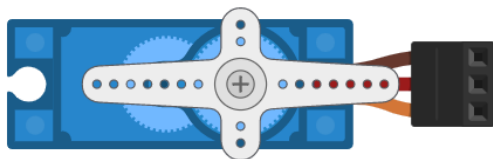
➤ IR Proximity:



This Sensor is a multipurpose infrared sensor that can be used for obstacle sensing, color detection, and line sensing.

In this project, it can sense the car.

➤ Servo motor:



It is an electronic device and rotary or linear actuators that rotate and push parts of a machine with precision.

It will be Open and Close the main gate.

Pins and Steps of connections:

At first, we have connected the LCD screen with I2c module.

GND	VCC	SDA	SCL
Ground	5V	A4	A5

Then, we have connected the IR sensor. It has 3 pins:

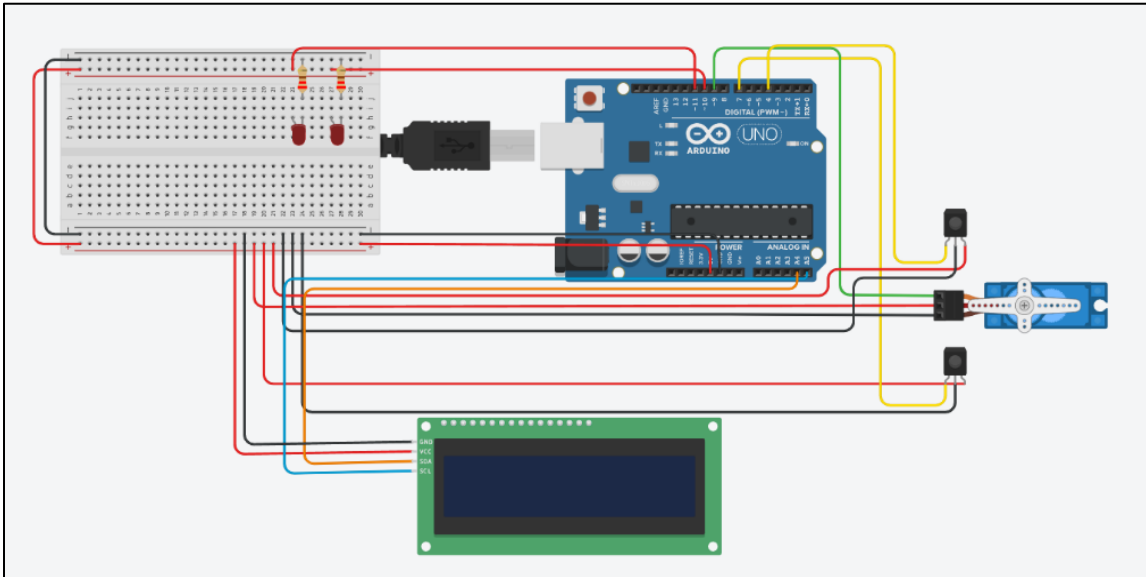
GND	VCC	OUT
Ground	5V	4

GND	VCC	OUT
Ground	5V	7

Finally, we have connected Servo Motor. It has 3 wires:

Orange	Red	Brown
9	5V	Ground

Simulation:



Code:

```
#include <LiquidCrystal_I2C.h>
LiquidCrystal_I2C lcd(0x27,16,2);
#include <Servo.h>
Servo myservo1;
int IR1 = 4; // IR Sensor 1
int IR2 = 7; // IR Sensor 2
int Car = 3; //Enter Total number of parking Slots
int f1 = 0;
int f2 = 0;

void setup()
{
  pinMode(11, OUTPUT);
  pinMode(10, OUTPUT);
  if (Car=3) {
    digitalWrite(11, HIGH);
  }
  lcd.begin(16,2);
  lcd.backlight();
  pinMode(IR1, INPUT);
```

```
pinMode(IR2, INPUT);
myservo1.attach(9);
myservo1.write(100);
lcd.setCursor (0,0);
lcd.print(" ARDUINO ");
lcd.setCursor (0,1);
lcd.print(" PARKING SYSTEM ");

delay (2000);
lcd.clear();

}
void loop(){
if(digitalRead (IR1) == LOW && f1==0){

if(Car>0){f1=1;
if(f2==0){myservo1.write(0);
Car = Car-1;
digitalWrite(11, HIGH);
digitalWrite(10, LOW);
}
}else{
lcd.setCursor (0,0);
lcd.print(" SORRY 😞 ");
lcd.setCursor (0,1);
lcd.print(" Parking Full ");
delay (500);
lcd.clear();
digitalWrite(10, HIGH);
digitalWrite(11, LOW);}
}
if(digitalRead (IR2) == LOW && f2==0){f2=1;
if(f1==0){myservo1.write(0); Car = Car+1;}
digitalWrite(11, HIGH);
digitalWrite(10, LOW);}
```

```
if(f1==1 && f2==1){  
  delay (1000);  
  myservo1.write(100);  
  f1=0, f2=0;  
}  
lcd.setCursor (0,0);  
lcd.print(" WELCOME! ");  
lcd.setCursor (0,1);  
lcd.print("car Left: ");  
lcd.print(Car);  
  
}
```

Pictures:

