Components Required

Arduino UNO

Two IR sensors

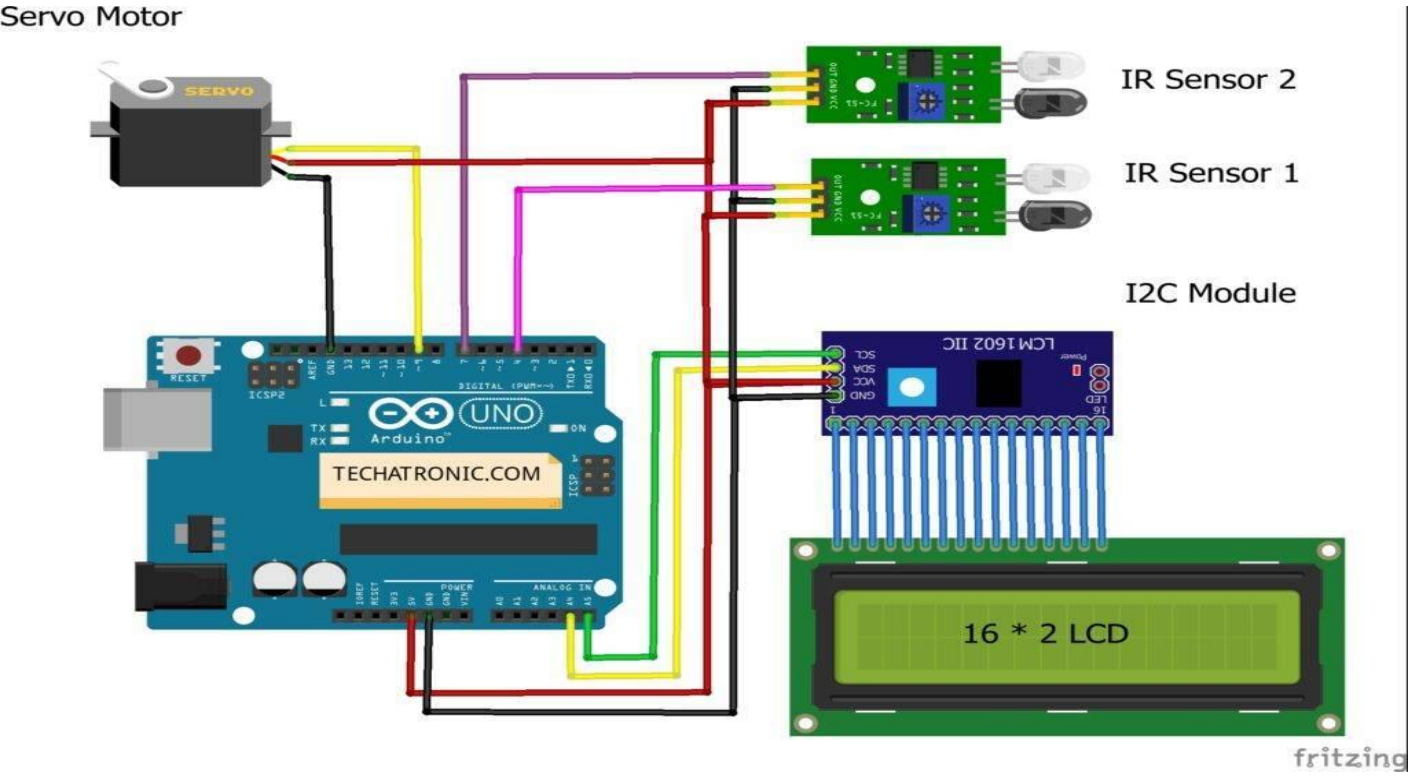
Servo motor

Jumper wires and a breadboard

16×2 LCD and an I2C module

USB cable for uploading the code

Program :

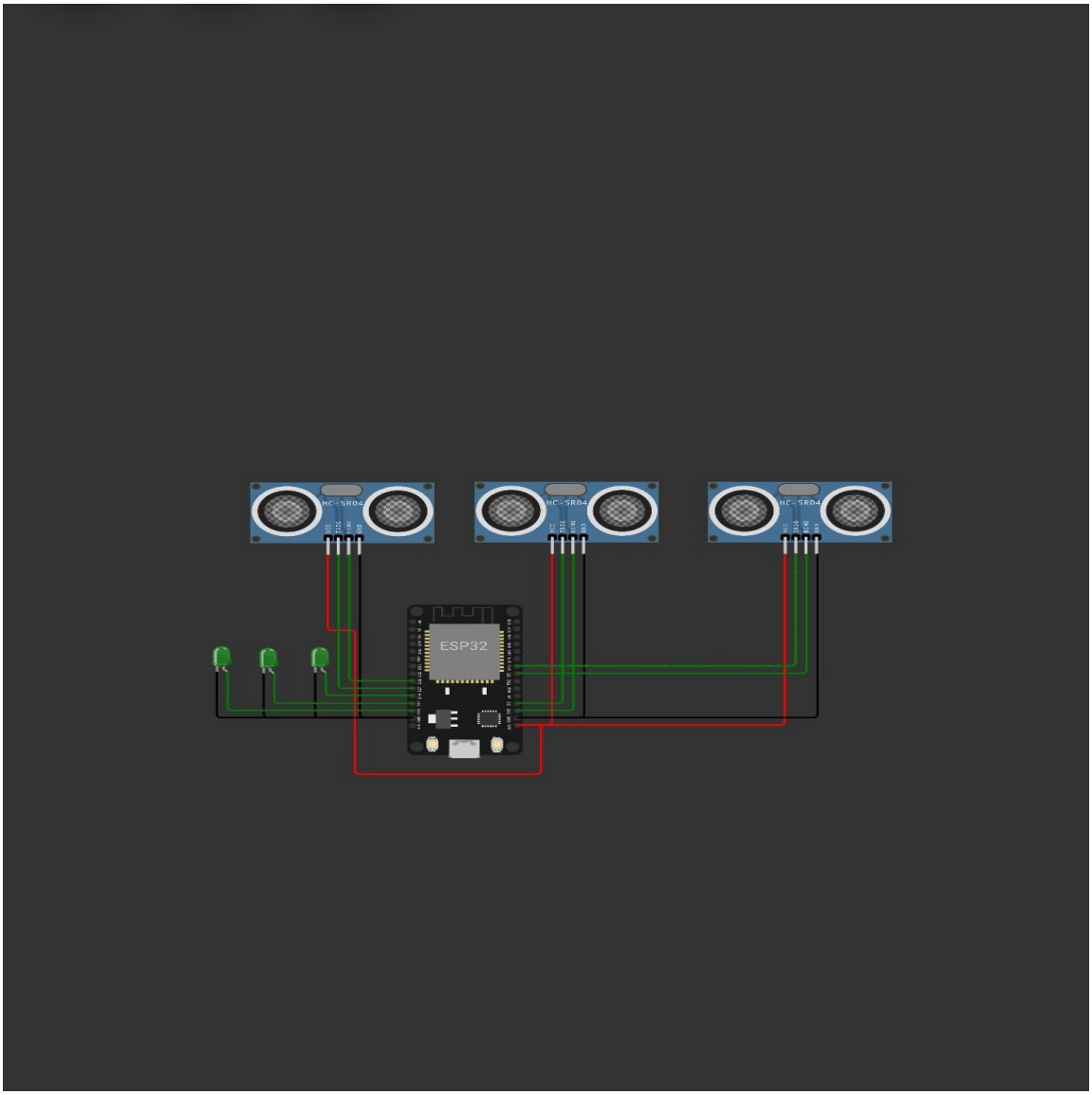



```
#include <Wire.h>
 #include <LiquidCrystal_I2C.h>
 LiquidCrystal_I2C lcd(0x27,16,2);
 #include <Servo.h>
 Servo myservo1;
 Int IR1 = 4; // IR Sensor 1
 Int IR2 = 7; // IR Sensor 2
 Int Slot = 4;      //Enter Total number of parking Slots
```

```
Int flag1 = 0;
Int flag2 = 0;
Void setup()
{
 Lcd.init();
 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 && flag1==0){
If(Slot>0){flag1=1;
If(flag2==0){myservo1.write(0); Slot = Slot-1;}
}else{
Lcd.setCursor (0,0);
Lcd.print(“  SORRY ☹  “);
Lcd.setCursor (0,1);
Lcd.print(“ Parking Full “);
Delay (3000);
Lcd.clear();
}
```

```
}
If(digitalRead (IR2) == LOW && flag2==0){flag2=1;
If(flag1==0){myservo1.write(0); Slot = Slot+1;}
}
If(flag1==1 && flag2==1){
Delay (1000);
Myservo1.write(100);
Flag1=0, flag2=0;
}
Lcd.setCursor (0,0);
Lcd.print(“  WELCOME!  “);
Lcd.setCursor (0,1);
Lcd.print(“Slot Left: “);
Lcd.print(Slot);
 }
```

2.



Hardware Setup:

A.Connect the HC-SR04 ultrasonic sensors to your ESP32 board. You will need one sensor per parking space.

Wire the HC-SR04 sensors as follows:

-VCC to 5V on ESP32

GND to GND on ESP32

Trig to a digital GPIO pin on ESP32 (e.g., GPIO2)

Echo to another digital GPIO pin on ESP32 (e.g., GPIO4)

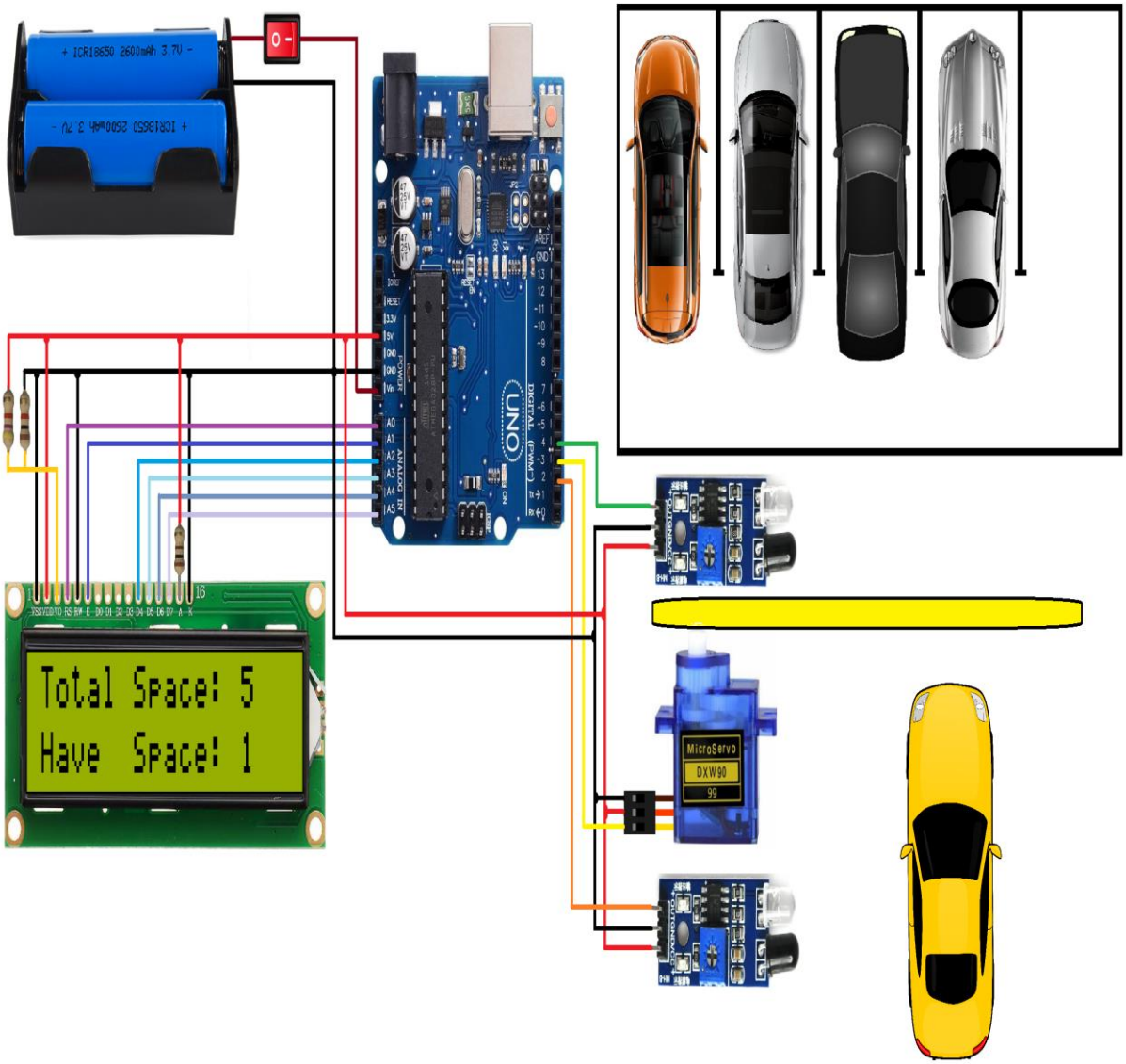
Connect all the sensors in the same way, one for each parking space you want to monitor.

Program:

```
#define ECHO_PIN1 15 //Pins for Sensor 1
#define TRIG_PIN1 2 //Pins for Sensor 1

#define ECHO_PIN2 5    //Pins for Sensor 2
#define TRIG_PIN2 18   //Pins for Sensor 2

#define ECHO_PIN3 26  //Pins for Sensor 3
#define TRIG_PIN3 27   //Pins for Sensor 3



Int LEDPIN1 = 13;
Int LEDPIN2 = 12;
Int LEDPIN3 = 14;

Void setup() {
  Serial.begin(115200);
  pinMode(LEDPIN1, OUTPUT);
  pinMode(TRIG_PIN1, OUTPUT);
  pinMode(ECHO_PIN1, INPUT);

   pinMode(LEDPIN2, OUTPUT);
  pinMode(TRIG_PIN2, OUTPUT);
  pinMode(ECHO_PIN2, INPUT);

   pinMode(LEDPIN3, OUTPUT);
  pinMode(TRIG_PIN3, OUTPUT);
  pinMode(ECHO_PIN3, INPUT);
}
```

Circuit diagram for IoT based car park

```cpp
#include <Ultrasonic.h>

Ultrasonic sensor1(GPIO_TRIGGER1, GPIO_ECHO1);
Ultrasonic sensor2(GPIO_TRIGGER2, GPIO_ECHO2);
// Add more sensors if needed

void setup() {
  Serial.begin(115200);
}

void loop() {
  long distance1 = sensor1.read();
  long distance2 = sensor2.read();
  // Read distances from more sensors if needed

  // Process distance data and manage parking spaces here

  delay(1000); // Delay for better readability
}
```


+ ICR18650 2600mAh 3.7V -
0 -
UNO
Total Space: 5
Have Space: 1
MicroServo
DXW90
99