

# Smart city

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## INTRODUCTION/MOTO:

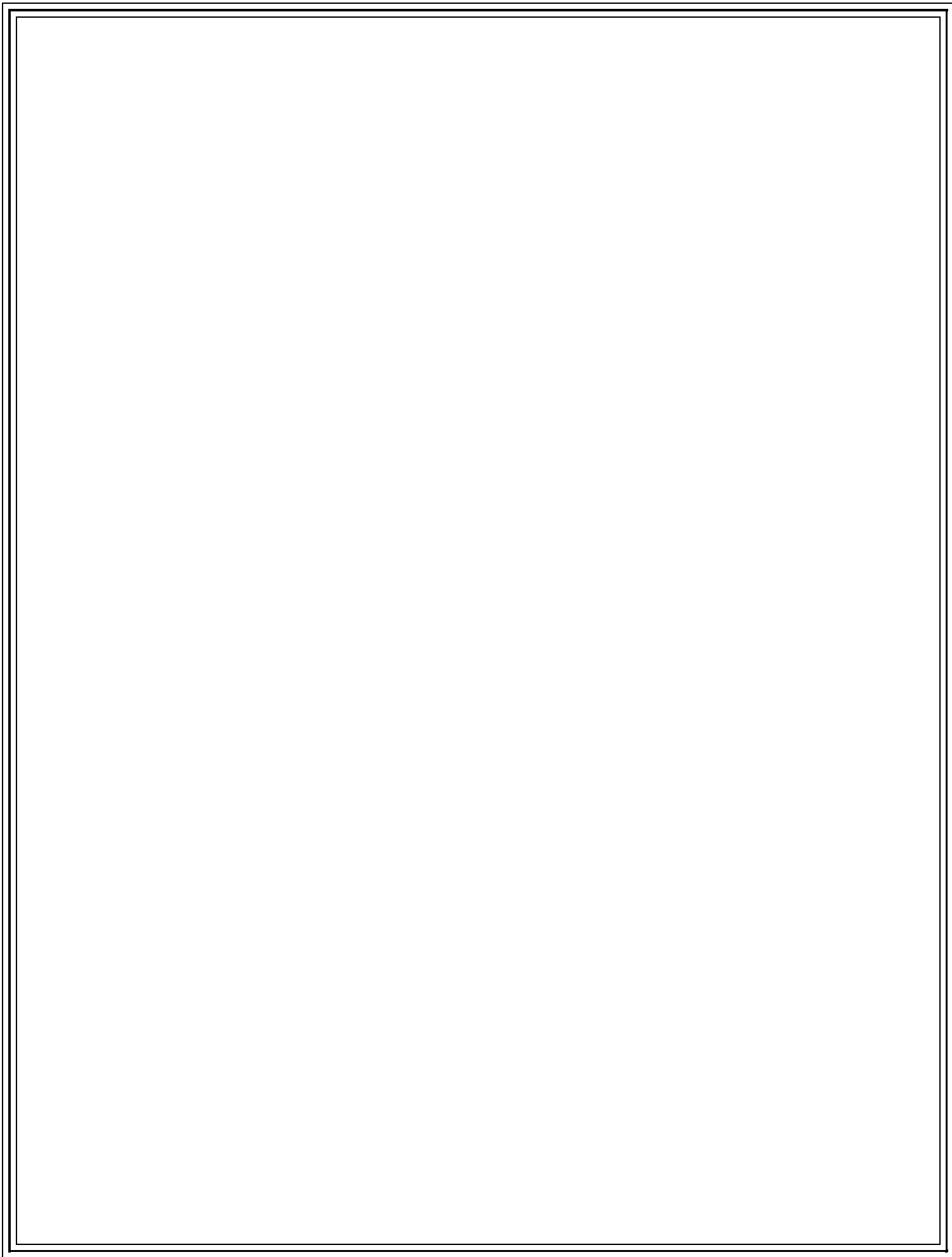
Cities around the world are getting “smarter” everyday through the implementation of Internet of Things (IoT) devices. “What exactly does it mean for a city to get smarter . Smart cities are communities that are building infrastructure to continuously improve the collection, aggregation and use of data to improve the lives of their residents by harnessing the growing data revolution, low-cost sensors and research collaborations, and doing so securely to protect public safety and individual privacy.

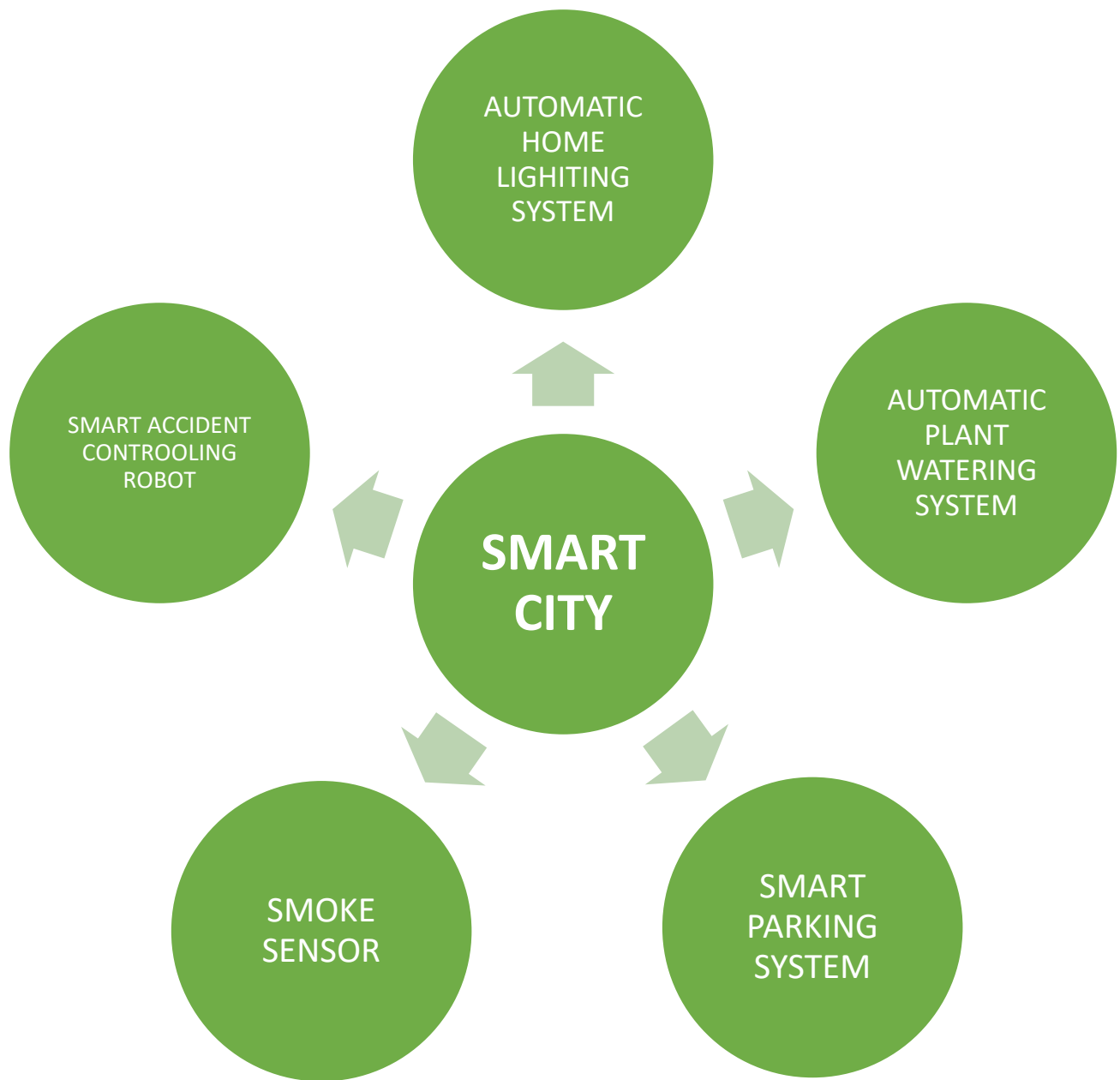
### **MOTO:**

1. I saw light's ON in many of the houses in my locality all over the night.
2. I saw parking problems which made traffic and waste the time of drivers
3. I saw many people smoking in public places even though it is banned there.
4. I had seen in news that many people were dead while seeing dasara when unfortunately a local train ran upon them and every day I hear about drunk and drive accidents and many times trains come out leaving the track and in army when the robots go inside dense forest they usually lose the control and are lost .

## AIM:

The total aim of my project is to safe guard human life, save energy and time.





## 1) ***Parking system in smart city :***

The parking systems are becoming more familiar in this country, so we are providing outstanding car parking system for you. This parking slot has new technology of smart way of parking. In this the LCD placed In front of the gate will show that which slot is free. If all the slots are filled with vehicles then the gate will not open. Any slots are free then the gate will open and allow the vehicle. The availability of place will be indicated in LCD display, driver can easily identify the free place for parking.

### Materials used:

- 5 IR sensors
- L293D motor shield
- 7805 Voltage regulator
- Gear motor
- Arduino UNO

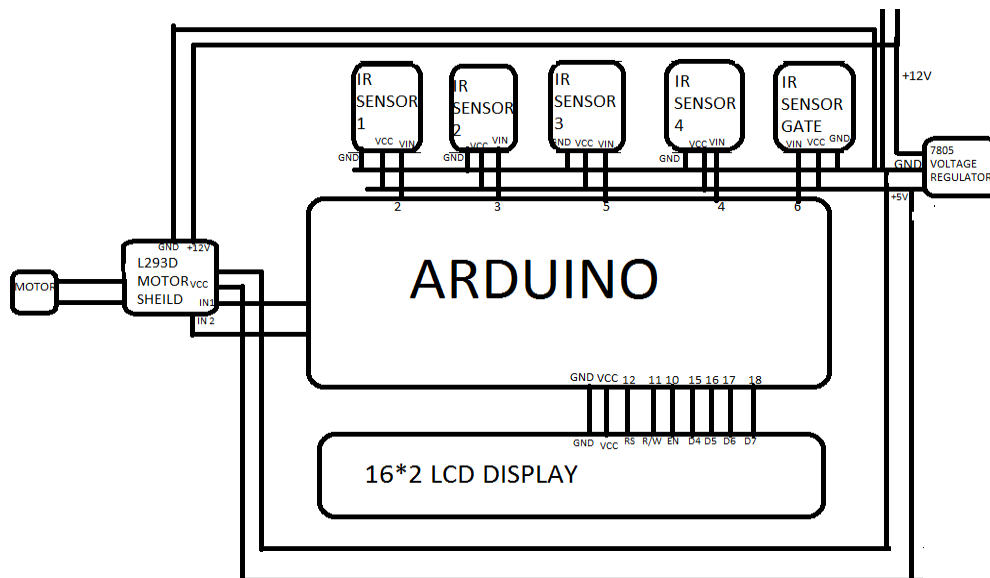
### Features:

- Economical solution
- Eliminates stress of drivers
- Easy and convenience providing
- Lower maintenance costs
- Improved concentration on traffic condition

- Display unit will act as independent control unit for entry/exit gate
- Decrease the fuel consumption and environmental cost
- Automatic parking reduces CO<sub>2</sub> emissions and other pollutants and greenhouse gases

## CIRCUIT AND CODE OF THE SMART PARKING LOT:

### CIRCUIT:



### CODE:

```
#include <LiquidCrystal.h>

LiquidCrystal lcd(12, 15, 16, 17, 18, 19);

int ir1 = 2;
int ir2 = 3;
int ir3 = 4;
```

```
int ir4 = 5;
int ir5 = 6;
#define a 10
#define b 11
void setup()
{
  Serial.begin(9600);
  lcd.begin(16, 2);
  lcd.clear();
  pinMode(ir1, INPUT);
  pinMode(ir2, INPUT);
  pinMode(ir3, INPUT);
  pinMode(ir4, INPUT);
  pinMode(ir5, INPUT);

  pinMode(a, OUTPUT);
  pinMode(b, OUTPUT);

}
void loop()
{
  lcd.setCursor(0, 0);
  lcd.print("Slot1:");
  lcd.print(digitalRead(ir1));
  lcd.setCursor(7, 0);
  lcd.print(" Slot2:");
  lcd.print(digitalRead(ir2));
  lcd.setCursor(0, 1);
```

```
lcd.print("Slot3:");  
lcd.print(digitalRead(ir3));  
lcd.setCursor(7, 1);  
lcd.print(" Slot4:");  
lcd.print(digitalRead(ir4));  
if ((digitalRead (ir1) == 1) && ( digitalRead (ir2) == 1) && ( digitalRead  
(ir3) == 1) && ( digitalRead (ir4) == 1))  
{  
  
    lcd.clear();  
    lcd.print("parking full");  
    delay(1000);  
    digitalWrite(a, LOW);  
    digitalWrite(b, LOW);  
}  
else if ( digitalRead (ir5) == 1)  
{  
    digitalWrite(a, HIGH);  
    digitalWrite(b, LOW);  
    delay(280);  
    digitalWrite(a, LOW);  
    digitalWrite(b, LOW);  
    delay(5000);  
    digitalWrite(a, LOW);  
    digitalWrite(b, HIGH);  
    delay(280);  
    digitalWrite(a, LOW);  
    digitalWrite(b, LOW);
```

```
}  
digitalWrite(a, LOW);  
digitalWrite(b, LOW);  
}
```

## **2)Automatic lighting system for Home**

**Automatic Room Lighting System is a microcontroller based project that automatically turns on or off the lights in a room. Electricity, being one of the most important resources, must be utilized carefully.**

**We often forget to switch off lights or fans when we leave a room. By using this system, we can intentionally forget about the lights as the system will automatically take care of them.**

**The digital World we are living in allows us to use different technologies to automatically perform certain tasks. Such automation is very useful in certain areas like energy consumption, reducing human efforts, improving standard of living etc.**

**The project implemented here is one such project where the microcontroller based system automatically controls the room lights**

**Aim of this project:**

**It is automatically turn on or off the lights in a room by detecting the human movement. We implemented this project using 7805 voltage regulator and two Infrared (IR) sensors. It saves electrical energy and solve energy crisis. It also avoids robbery of home or shops. If this idea is used for streets or high ways a huge amount of electrical energy can be saved.**



## Materials used:

IR sensor, Relay module, Bulb holder, 7805 voltage regulator, LED bulb

## 3) Automatic watering system for plants:

This is the project of automatic control watering for plants in garden, in the farmer field. This is real time project; it works on soil moisture sensor. When soil moisture is below the set humidity, the relay will automatically start to spray. It will stop automatically when it reaches the set humidity. It saves water, power, time and also plants life. It can be used to control soil moisture over a wide range by adjusting the corresponding threshold value on the potentiometer. When the humidity is below the set value, the motor starts itself. When the humidity is higher than the set value, the relay shuts down;

## Applications:

You can automatically water your vegetable farm and garden, and control soil moisture in your flowerpots. The large power relay enables you to control large current equipment. When the humidity is below the set value, the relay starts; when the humidity is higher than the set value, the relay shuts down. The delay function can solve the problem that when in no delay moisture critical state, the relay keeps flickering.

It is easy and practical to use.

This project is very useful for the farmers. In Karnataka BESCO supply power for farmer only 6 to 8 hrs. i.e three phase current. In day time 3 to 4 hrs and in night time 3 to 4 hrs. Farmers found difficulty to watering for their yields during night time because most of the farmers working at day time and get tired, they may go to sleep early. Farmers faced difficulty to go their field at night because of wild animal. So they get fewer yields and become loss.

Our project replaces all these problems in single step. This technology is helpful to people in their daily activities by reducing or completely

replacing their effort and also can be used in different fields.

#### **4) MQ-2 Smoke detector alarm:**

A Smoke Detector is a smoke sensing device. In this project, we implemented a simple smoke detector circuit. We used Smoke sensor MQ-2 as the main sensor device. The MQ-2 smoke sensor is sensitive to smoke and to the following flammable gases: LPG, Butane, Propane, Methane, Alcohol and Hydrogen. This sensor senses the smell released from cigarette or other tobacco smoke. This also can be used as fire alarm. It makes sound when fire releases smoke.

#### **Materials used:**

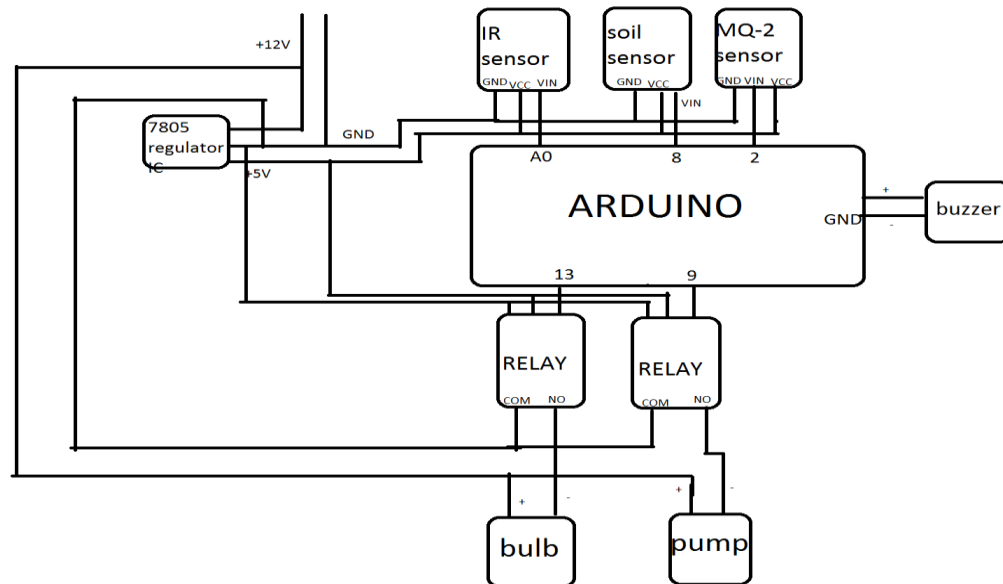
- Arduino UNO
- MQ-2
- buzzer

#### **Applications:**

- Shopping malls
- Banks
- Movie theaters
- Office
- Laboratory
- In homes
- Schools
- Industries
- Public places
- Smoke Detectors are very useful devices as the damage caused by fire accidents is catastrophic.

# CODE AND CIRCUIT DIAGRAM OF HME LIGHITHING, AUTOMATIC PLANT WATERING SYSTEM AND SMOKE SENSOR:

## CIRCUIT:



## CODE:

```
int mqsen = 2;
int buz = 3;
int ir_bulb = 8;
int relay = 9;
int led = 13;
int sensorPin = A0; // select the input pin for the potentiometer
int sensorValue = 0; // variable to store the value coming from the sensor
int output_value;

void setup()
{
```

```
pinMode(mqsen , INPUT);
pinMode(buz, OUTPUT);
pinMode(ir_bulb , INPUT);
pinMode(relay, OUTPUT);
Serial.begin(9600);
pinMode(led, OUTPUT);

}

void loop()
{
  if ( digitalRead( mqsen ) )
  {
    digitalWrite(buz, HIGH);
    delay(5000);
    digitalWrite(buz, !HIGH);
  }

  if ( digitalRead( ir_bulb ) )
  {
    digitalWrite(relay, HIGH);
    delay(5000);
    digitalWrite(relay, !HIGH);
  }
  sensorValue = analogRead(sensorPin);
  output_value = map(sensorValue, 1023, 0, 0, 100);
  Serial.print("sensor = " );
```

```
Serial.print(output_value);  
Serial.println("%");  
if ( output_value < 20)  
{  
    digitalWrite(led, HIGH);  
    delay(5000);  
    digitalWrite(led, !HIGH);  
}  
}
```

## 5) SMART ACCIDENT CONTROLLED ROBOT

Working of line follower with obstacle and anti drunk control system is very interesting. Line follower robot senses black line by using sensor and then sends the signal to arduino. Then arduino drives the motor according to sensors' output. It is smart robot with line following technology, Concept of working of line follower is related to light. We use here the behavior IR rays. It senses black surface. And Obstacle Avoiding is a type which avoids collision with unexpected obstacles. After the obstacle is cleared the robot moves following the line.

In this project, an Obstacle Avoiding Robot is designed. It is an Arduino based robot that uses Infrared rays to detect the obstacle .and main and use full thing included in the robot is anti drunk driving system ,In this system the vehicle automatically stops and does not move until the value gets down.

### Components Required

- Arduino UNO
- Pair of IR (Infrared) Sensor -3
- Motor Driver shield
- Two Wheel
- Motor Driver IC - L293D

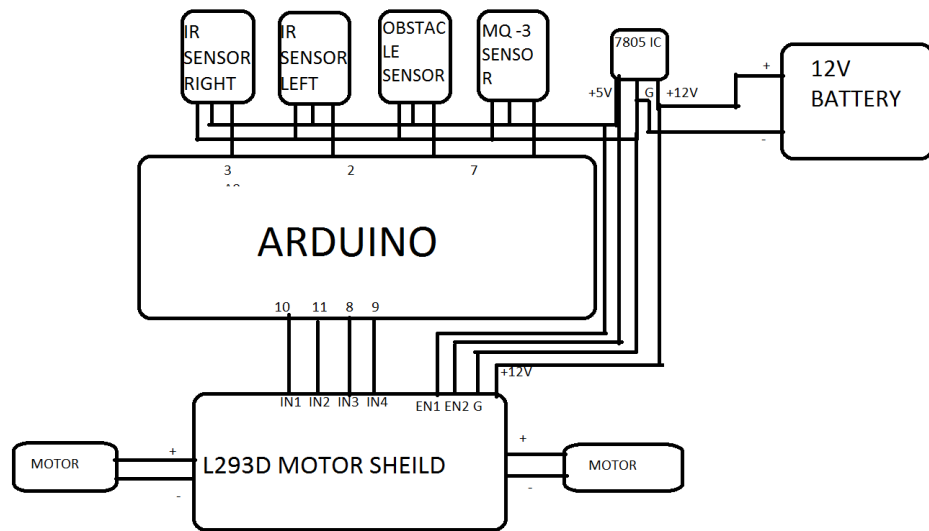
- **Servo Motor (Tower Pro SG90)**
- **Geared Motors x 2**
- **Robot Chassis**
- **12V Power Supply**
- **MQ-3 Gas sensor**

**Application:**

- **Military**
- **To avoid road traffic**
- **Line following trains reduces fuel consumption**
- **It reduces train accidents**
- **They can be used for household work like automatic vacuum cleaning.**
- **They can also be used in dangerous environments, where human penetration could be fatal.**
- **Avoids the accident caused by the drunk and drive.**

**CODE AND CIRCUIT OF SMART  
ACCIDENT CONTROLLED ROBOT:**

**CIRCUIT:**



## CODE:

```
#define LS 2    // left sensor
#define RS 3    // right sensor
#define FS 7    //obstacle
/*-----definning Outputs-----*/
#define lma 8    // left motor
#define lmb 9    // left motor
#define rma 10    // right motor
#define rmb 11    // right motor
int sensor = A0;
int gas_value;
//char data = 0;
void setup()
{
    pinMode(LS, INPUT);
    pinMode(RS, INPUT);
    pinMode(FS, INPUT);
```

```
pinMode(lma, OUTPUT);
pinMode(lmb, OUTPUT);
pinMode(rma, OUTPUT);
pinMode(rmb, OUTPUT);
int sensor = A0;
Serial.begin(9600);
}
void loop()
{
```

```
gas_value = analogRead(sensor);
delay(500);
Serial.println(gas_value);
if ((gas_value < 200) && (digitalRead(FS) == 0))
{
    if ((digitalRead(LS)) && (digitalRead(RS))) // Move Forward
    {
        digitalWrite(lma, HIGH);
        digitalWrite(lmb, LOW);
        digitalWrite(rma, HIGH);
        digitalWrite(rmb, LOW);
    }

    if ((digitalRead(RS)) && (!digitalRead(LS))) // Turn right
    {
        digitalWrite(lma, LOW);
        digitalWrite(lmb, LOW);
```



```
    digitalWrite(rma, HIGH);
    digitalWrite(rmb, LOW);
}

if ((!digitalRead(RS)) && (digitalRead(LS))) // turn left
{
    digitalWrite(lma, HIGH);
    digitalWrite(lmb, LOW);
    digitalWrite(rma, LOW);
    digitalWrite(rmb, LOW);
}

if ((!digitalRead(LS)) && (!digitalRead(RS))) // stop
{
    digitalWrite(lma, LOW);
    digitalWrite(lmb, LOW);
    digitalWrite(rma, LOW);
    digitalWrite(rmb, LOW);
}

}
else
{
    digitalWrite(lma, LOW);
    digitalWrite(lmb, LOW);
    digitalWrite(rma, LOW);
    digitalWrite(rmb, LOW);
}
```

}

## DATA COLLECTION AND INTERPRETATION:

1. ARDUINO.CC/PROJET HUB
2. HAKERS.IO
3. ARDUINO STARTERS GUIDE BY BYRON FRANCIS

## COST OF THE PROJECT:

NAME	NO.OF.ITE	COST	TOTAL COST
ARDUINO UNO	3	350	1350
IR SENSOR	11	65	715
MQ-3 SENSOR	1	150	150
MQ-2 SENSOR	1	150	150
SOIL SENSOR	1	200	200
GEAR MOTOR	3	100	300
7805 IC	3	65	195
L293D MOTOR SHEILD	2	150	300
WATER PUMP	1	150	150
LED BULB	1	30	30
16*2 LCD	1	250	250
BUZZER	1	10	10
RELAY MODULE	2	35	70
LED BULB	2	2	4
WIRES		150	150
OTHERS		700	700
ROBOT CHASIS	1	100	100
GRAND TOTAL			4824

## CONCLUSION AND RESULT:

If we develop the crowded city infrastructure using low cost sensors we can get the solutions to make crowded cities more manageable and more affordable for every one

## FURTHER RESEARCH \DEVELOPMENT OF THE PROJECT:

- The parking lot can be modified by IoT based creating a app and to find where the parking lot is free near me, how many slots are filled and which slot is available.
- The smoke sensor can also be modified like if anybody smokes, the authority should get the message that somebody is smoking.
- Automatic plant watering system can be developed into robot so that it can sense the water level everywhere and water the plants which have low moisture.
- The smart accident controlled robot can be modified like as soon the system come to know the driver is drunk it should send the message to the police station that in this altitude a vehicle with drunk drive is noticed .

# Thank you