

```
const int pingPin_1 =10; // Trigger Pin of Ultrasonic Sensor front uv_sensor
const int echoPin_1 = 11; // Echo Pin of Ultrasonic Sensor
const int pingPin =14; // Trigger Pin of Ultrasonic Sensor
const int echoPin =15; // Echo Pin of Ultrasonic Sensor //pothole sensor
int IN1=6; //FORWARD BACKWARD
int IN2=7;
int IN3=9;
int IN4=8;
int IN5=4; //FILLING
int IN6=5;
int IN7=2; // LEVELING
int IN8=3;
void FORWARD();
void REVERSE();
void LEFT();
void RIGHT();
void STOP();
void SerialEvent();
void OPEN_MUD();
void LEVEL_FILL();
void LEVEL_FILL_1();
void LEVEL_UP();
long microsecondsToCentimeters(long microseconds);
//char ch;
char ch;
void setup()
{
    pinMode(IN1,OUTPUT);
    pinMode(IN2,OUTPUT);
```

```
pinMode(IN3,OUTPUT);
pinMode(IN4,OUTPUT);
pinMode(IN5,OUTPUT);
pinMode(IN6,OUTPUT);
pinMode(IN7,OUTPUT);
pinMode(IN8,OUTPUT);
pinMode(pingPin_1,OUTPUT);
pinMode(echoPin_1,INPUT);
pinMode(pingPin,OUTPUT);
pinMode(echoPin,INPUT);

digitalWrite(IN1,LOW);
digitalWrite(IN2,LOW);
digitalWrite(IN3,LOW);
digitalWrite(IN4,LOW);

Serial.begin(9600); // Starting Serial Terminal
Serial.println("POTHOLE DETECTION ROBOT..");
Serial.println("PDIT COLLEGE...");
delay(1000);
}

void loop()
{
while(1)
{
if(Serial.available()>0)
{
char ch=Serial.read();
if(ch=='A')
{
Serial.println("auto mode");
```

```

    AUTO_MODE();
}
if(ch=='M')
{
    Serial.println("manual mode");
    MANUAL_MODE();
}
}
}
}

void AUTO_MODE()
{
    while(1)
    {
        FORWARD();
        SENSOR_UV();
        SENSOR_UV_1();
    }
}

char Serial_read(void)
{
    char ch;
    while(Serial.available() == 0);
    ch = Serial.read();
    return ch;
}

void SENSOR_UV()                /// POTHOLE US
{
    long duration, inches, cm;

```

```
pinMode(pingPin, OUTPUT);
digitalWrite(pingPin, LOW);
delayMicroseconds(2);
digitalWrite(pingPin, HIGH);
delayMicroseconds(10);
digitalWrite(pingPin, LOW);
pinMode(echoPin, INPUT);
duration = pulseIn(echoPin, HIGH);
cm = microsecondsToCentimeters(duration);
Serial.print("POTHOLE:");
Serial.println(cm);
// Serial.print("cm");
// Serial.println();
// delay(500);
if(cm>10)
{
    Serial.println("POTHOLE DETECTED1:");
    delay(200);
    STOP();
    delay(1000);
    FORWARD();
    delay(200);
    STOP();
    delay(1000);
    OPEN_MUD();
    delay(1000);
    LEVEL_DOWN();
    delay(1000);
    FORWARD();
}
```

```
    delay(5000);
    STOP();
    delay(1000);
    LEVEL_UP();
    delay(1000);
    STOP();
    delay(1000);
}
if((cm>40)&&(cm<59))
{
    Serial.println("POTHOLE DETECTED WIDTH MORE THAN 40CM:");
    delay(200);
    STOP();
    delay(1000);
    FORWARD();
    delay(200);
    STOP();
    delay(1000);
    OPEN_MUD();
    delay(2000);
    LEVEL_DOWN();
    delay(1000);
    FORWARD();
    delay(5000);
    STOP();
    delay(1000);
    LEVEL_UP();
    delay(1000);
    STOP();
```

```

        delay(1000);
    }
    if(cm>60)
    {
        Serial.println("POTHOLE WIDTH MORE CAN NOT FILL#");
        delay(1000);
    }
    else
    {
        // FORWARD();
    }
}

void SENSOR_UV_1()                // OBJECT SIDE US
{
    long duration_1, inches_1, cm_1;
    pinMode(pingPin_1, OUTPUT);
    digitalWrite(pingPin_1, LOW);
    delayMicroseconds(2);
    digitalWrite(pingPin_1, HIGH);
    delayMicroseconds(10);
    digitalWrite(pingPin_1, LOW);
    pinMode(echoPin_1, INPUT);
    duration_1 = pulseIn(echoPin_1, HIGH);
    cm_1 = microsecondsToCentimeters(duration_1);
    Serial.print("OBJECT:");
    Serial.println(cm_1);
    // Serial.print("cm");
    // Serial.println();
    delay(100);
}

```

```
if(cm_1<25)
{
    Serial.println("OBJECT DETECTED");
    delay(800);
    STOP();
    delay(2000);
//    OPEN_MUD();
//    delay(1000);
//    LEVEL_UP();
//    delay(1000);
//    FORWARD();
//    delay(2000);
//    REVERSE();
//    delay(1000);
//    STOP();
//    delay(1000);
//    LEVEL_FILL_1();
//    RIGHT();
//    delay(8000);
//    STOP();
//    delay(1000);
//    STOP();
//    delay(1000);
//    FORWARD();
//    delay(800);
//    STOP();
//    delay(1000);
//    FORWARD();
//    delay(800);
```

```
//  STOP();
//  delay(1000);
//  OPEN_MUD();
//  delay(1000);
//  FORWARD();
//  //delay(2000);
//  LEVEL_UP();
//  delay(5000);
//  FORWARD();
//  delay(1000);
//  REVERSE();
//  delay(1000);
//  STOP();
//  delay(1000);
//  LEVEL_FILL_1();
//  delay(2000);
    }
//  else{
//      FORWARD();
////      SENSOR_UV_1();
////      delay(1000);
////      STOP();
////      delay(1000);
////      FORWARD();
////      delay(1000);
////      STOP();
////      delay(1000);
////      FORWARD();
////      delay(1000);
```



```

////    STOP();

////

//    }

//    if(cm_1>60)

//    {

//        Serial.println("POTHOLE WIDTH MORE CAN NOT FILL");

//        Serial.write("AT+CIPSEND=0,16\r\n"); // MULTIPLE MODE SELECTION

//        delay(50);

//        Serial.write("POTHOLE WIDTH MORE CAN NOT FILL");

//        delay(50);

//        Serial.write("\n\r\r"); // MULTIPLE MODE SELECTION

//        delay(1000);

//

//    }

void OPEN_MUD()

{

    Serial.println("POTHOLE FILLING..");

    digitalWrite(IN5,HIGH);

    digitalWrite(IN6,LOW);

    delay(500);

    digitalWrite(IN5,LOW);

    digitalWrite(IN6,LOW);

    delay(2000);

    digitalWrite(IN5,LOW);

    digitalWrite(IN6,HIGH);

    delay(500);

    digitalWrite(IN5,LOW);

    digitalWrite(IN6,LOW);

    delay(1000);

```

```
}  
  
void LEVEL_DOWN()  
{  
    Serial.println("POTHOLE LEVELLING");  
    digitalWrite(IN7,HIGH);  
    digitalWrite(IN8,LOW);  
    delay(500);  
    digitalWrite(IN7,LOW);  
    digitalWrite(IN8,LOW);  
    delay(1000);  
    //delay(2000);  
}  
  
void LEVEL_UP()  
{  
    Serial.println("POTHOLE LEVELLING");  
    digitalWrite(IN7,LOW);  
    digitalWrite(IN8,HIGH);  
    delay(500);  
    digitalWrite(IN7,LOW);  
    digitalWrite(IN8,LOW);  
    delay(1000);  
}  
  
void FORWARD()  
{  
    Serial.println("FORWARD");  
    digitalWrite(IN1,HIGH);  
    digitalWrite(IN2,LOW);
```

```
    digitalWrite(IN3,HIGH);
    digitalWrite(IN4,LOW);
}
void REVERSE()
{
    Serial.println("REVERSE");
    digitalWrite(IN1,LOW);
    digitalWrite(IN2,HIGH);
    digitalWrite(IN3,LOW);
    digitalWrite(IN4,HIGH);
}
void LEFT()
{
    Serial.println("LEFT..");
    digitalWrite(IN1,HIGH);
    digitalWrite(IN2,LOW);
    digitalWrite(IN3,LOW);
    digitalWrite(IN4,HIGH);
}
void RIGHT()
{
    Serial.println("RIGHT");
    digitalWrite(IN1,LOW);
    digitalWrite(IN2,HIGH);
    digitalWrite(IN3,HIGH);
    digitalWrite(IN4,LOW);
}
void STOP()
{
```

```
Serial.println("STOP..");

digitalWrite(IN1,LOW);

digitalWrite(IN2,LOW);

digitalWrite(IN3,LOW);

digitalWrite(IN4,LOW);

}

long microsecondsToCentimeters(long microseconds) {
    return microseconds / 29 / 2;
}

//char ch;

void MANUAL_MODE()
{
    while(1)
    {
        if (Serial.available() > 0)
        {
            char ch =Serial.read();

            Serial.print(ch);

            if (ch == 'F')
            {
                Serial.println("FORWARD MOVEMENT");

                delay(1000);

                FORWARD();
            }

            if (ch == 'R')
            {
                Serial.println("FORWARD MOVEMENT");

                delay(1000);

                RIGHT();
            }
        }
    }
}
```

```
}  
if(ch=='S')  
{  
    Serial.println("STOP");  
    delay(1000);  
    STOP();  
}  
if(ch=='O')  
{  
    Serial.println("OPEN MUD");  
    delay(1000);  
    OPEN_MUD();  
}  
if(ch=='D')  
{  
    Serial.println("LEVEL DOWN");  
    delay(1000);  
    LEVEL_DOWN();  
}  
if(ch=='U')  
{  
    Serial.println("LEVEL UP");  
    delay(1000);  
    LEVEL_UP();  
}  
if(ch=='B')  
{  
    REVERSE();  
    Serial.println("REVERSE ...");  
}
```

```
        delay(1000);
    }
    if(ch=='L')
    {
        LEFT();
        Serial.println("LEFT ...");
        delay(1000);
    }
    //    SENSOR_UV();
    }
}
// 3SENSOR_UV_1();
}
```