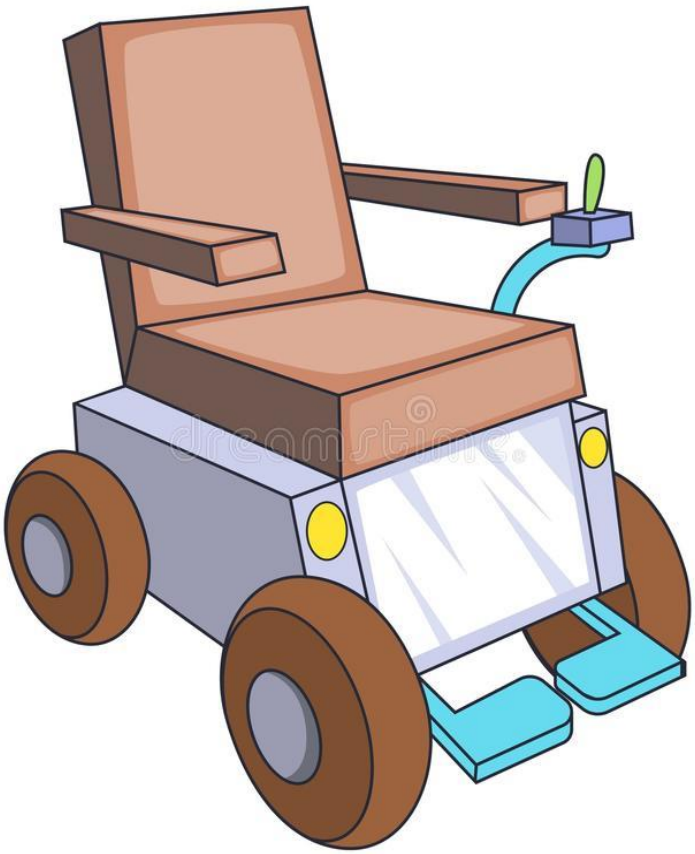
Smart Wheel Chair



SMART WHEEL CHAIR

ABSTRACT:

The wheelchairs available in market are too expensive and are beyond the reach of poor and middle class families. Most of the Wheelchairs are single functioned either it will be operated with voice or joystick. We are designing a wheelchair that will be a low cost and multifunction. This project aims to make life easier for the disabled and elderly people who cannot move properly it will enable them to lead better lives without any problem.

INTRODUCTION:

Smart Wheel Chair is mechanically controlled devices designed to have selfmobility with the help of the user command. This reduces the user's human effort and force to drive the wheels for wheelchair. Furthermore it also provides an opportunity for visually or physically impaired persons to move from one place to another.

OBJECTIVE:

I believe that a project must be done in such a way that it finds solution to a problem. I thought of doing this project after seeing my grandmother who is a disabled person who completely depends on others .Everyone in this world wishes to be independent person. This prototype helps a disabled person to be independent. This is a voice controlled wheel chair. Bluetooth module is connected to the phone and the disabled person can operate the wheel chair with voice. It also has ultrasonic sensors which automatically detects the obstacles and stop the wheelchair. Disabled person can operate the wheel chair in all directions using voice. During a panic situation, the disabled person can say alarm so that the buzzer gives a beep sound. This wheel chair also has a LED light so that it is helpful for the disabled person to roam around at night time. Furthermore we can also add GPS module in the wheelchair so that the person who takes care of the

disabled person can see the location at any time. We can also setup emergency SOS on the wheelchair so that when the disabled person says' danger ahead' it will send message automatically to the guardian. We can also add chin gesture control so that it can be used by handless person. Furthermore we can also add fire alarm ,vehicle detection in the wheelchair. We can add voice recognition module so that wheelchair responds only authorized voices.

ADVANTAGES:

• Obstacle detection using IR sensor
• Less expensive than the conventional wheel chair
• Less wiring because of Bluetooth
• Reduce man power
• User friendly
• More reliable
• Input can be changed rapidly

APPLICATIONS:

- It has ultrasonic sensors which automatically detects the obstacles and stop the wheelchair.
- It has LED light so that the disabled person can roam around easily at night time.
- Disabled person can operate the wheelchair in all directions using voice.

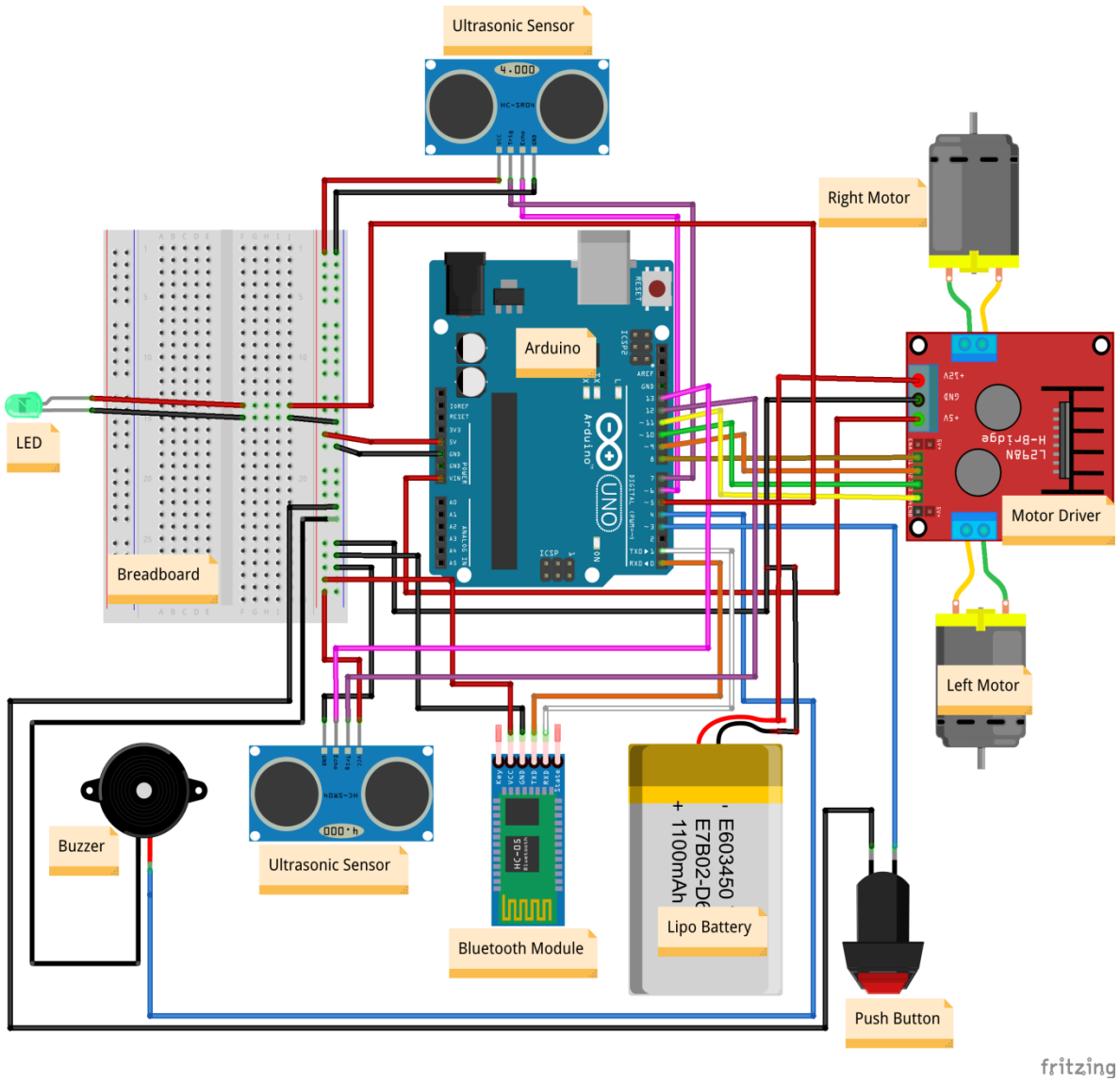
FUTURE SCOPE:

- Some more applications like vehicle detection, slippery floor, on-coming vehicle detection and fire or smoke alarm can also be included.
- One more application is for the family members to gain access to the blind person’s location through the server whenever needed.
- Use of RFID tags will transmit the location information automatically to the PCB unit when the intelligent stick is in its range.
- We can also add chin gesture movement.
- We can also setup emergency SOS on the wheelchair so that when the disabled person gives alert the message will be automatically sent to the guardian.

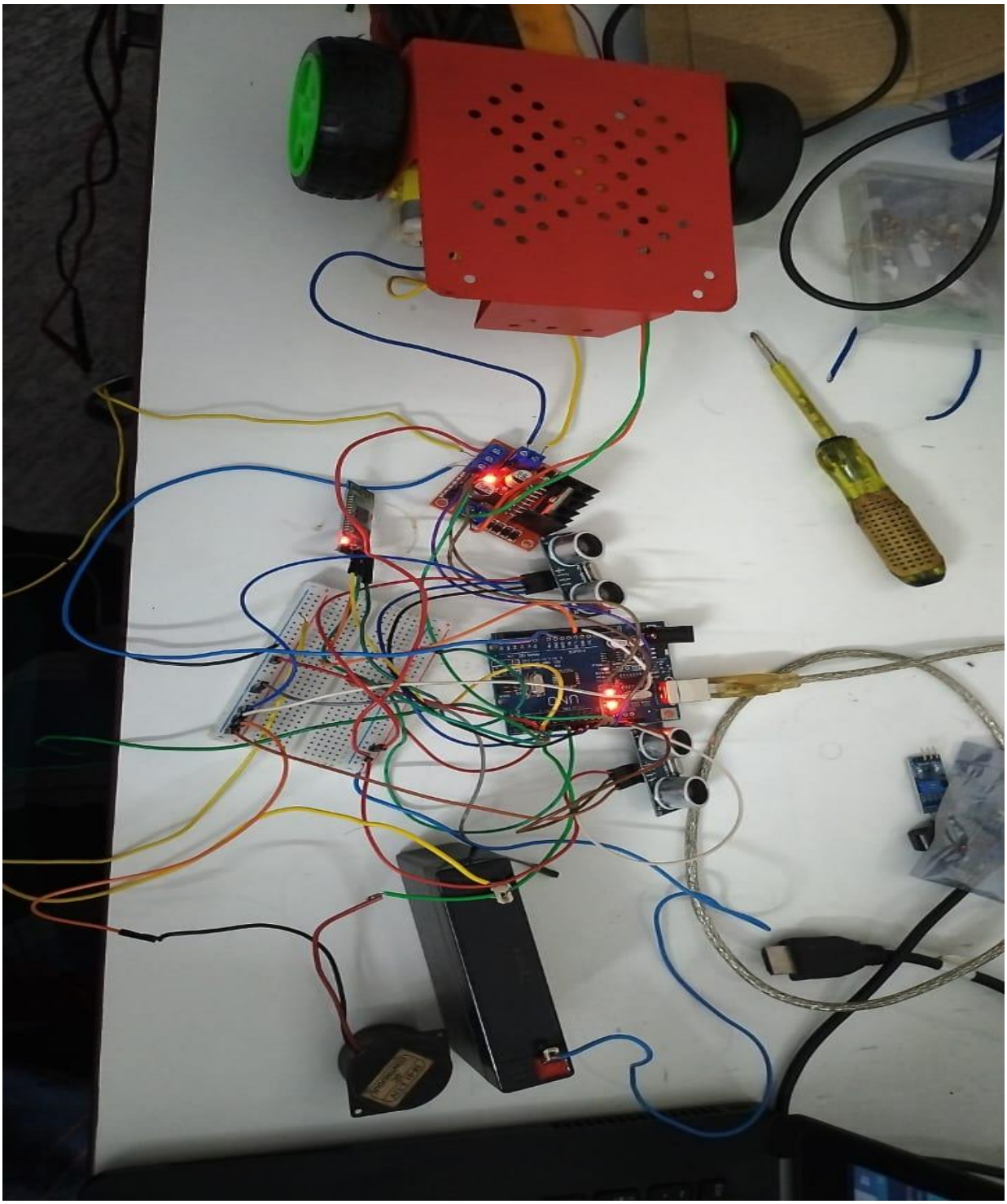
CONCLUSION:

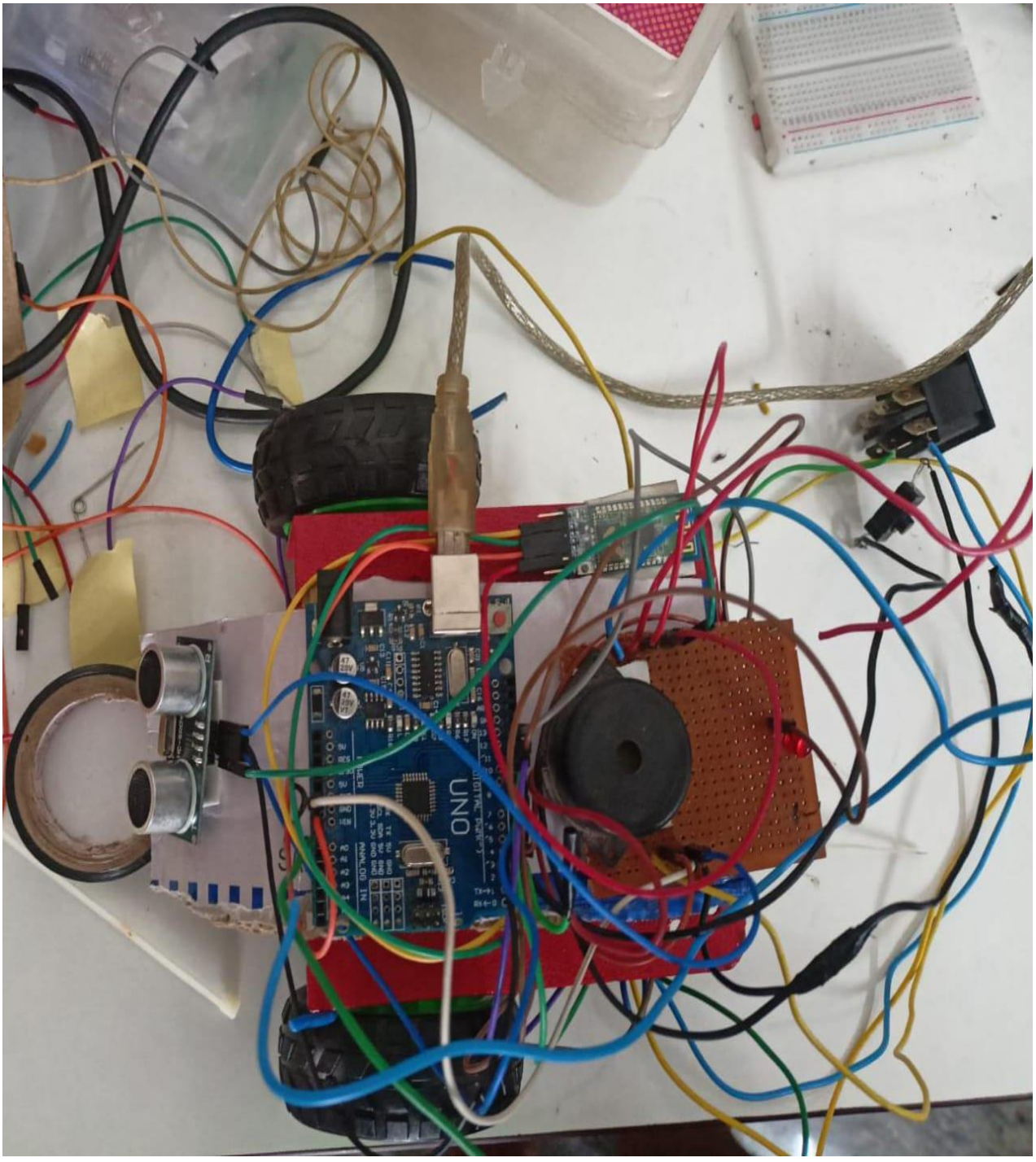
The main aim of this project implementation is to help all the people who are dependent on wheelchair for their mobility. Wheelchair is simple to operate and does not need any external help. The objectives of this project have been achieved successfully. This project was able to develop an android system that can control the movement of the wheelchair. The application built can be used with many android phones.

CIRCUIT DIAGRAM:



INITIAL STAGES :




UNO

ARDUINO CODE:

```
#include <SoftwareSerial.h>
int motorRightA = 8;    //Right Motor-clockwise
int motorRightB = 9;   //Right Motor-anticlockwise
int motorLeftA = 11;   //Left Motor-clockwise
int motorLeftB = 10;   //Left Motor-anticlockwise
int trigPin1 = 12;     // Trig Pin
int echoPin1 = 13;     // Echo Pin
int light = 5;
long duration1;
int distance1;
char bt = 0;           //Bluetooth Control
int trigPin2 = 7;      // Trig Pin
int echoPin2 = 6;      // Echo Pin
long duration2;
int distance2;
int buzzer = 4;
int pushButton = 3;
String voice;
int TxD = TxD;
int RxD = RxD;
SoftwareSerial bluetooth(TxD, RxD);

void setup()
{
  pinMode(motorRightA, OUTPUT);
  pinMode(motorRightB, OUTPUT);
  pinMode(motorLeftA, OUTPUT);
  pinMode(motorLeftB, OUTPUT);
  pinMode(trigPin1, OUTPUT);
  pinMode(echoPin1, INPUT);
  pinMode(trigPin2, OUTPUT);
  pinMode(echoPin2, INPUT);
  pinMode(light, OUTPUT);
  pinMode(buzzer, OUTPUT);
  pinMode(pushButton, INPUT_PULLUP);
  Serial.begin(9600);
```

```
  bluetooth.begin(9600);
}
void loop()
{
   //Light On Off


  //  Right
  digitalWrite(trigPin1, LOW);
  delayMicroseconds(2);
  // Sets the trigPin on HIGH state for 10 micro seconds
  digitalWrite(trigPin1, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin1, LOW);
  // Reads the echoPin, returns the sound wave travel time in microseconds
  duration1 = pulseIn(echoPin1, HIGH);
  // Calculating the distance
  distance1 = duration1 * 0.1/2;
  // Prints the distance on the Serial Monitor
  Serial.print("Distance1: ");
  Serial.println(distance1);

  // Left
  digitalWrite(trigPin2, LOW);
  delayMicroseconds(2);
  // Sets the trigPin on HIGH state for 10 micro seconds
  digitalWrite(trigPin2, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin2, LOW);
  // Reads the echoPin, returns the sound wave travel time in microseconds
  duration2 = pulseIn(echoPin2, HIGH);
  // Calculating the distance
  distance2 = duration2 *0.1/2;
  // Prints the distance on the Serial Monitor
  Serial.print("Distance2: ");
  Serial.println(distance2);

  if (distance1 <= 25 || distance2 <= 25) {
    //Stop Wheel Chair
    digitalWrite(motorRightA, LOW);
    digitalWrite(motorRightB, LOW);
```

```
    digitalWrite(motorLeftA, LOW);
    digitalWrite(motorLeftB, LOW);
  }
  control();
}
 void control()
 {
   if (bluetooth.available())
   {
    voice = Serial.readString();


   }


    if (voice == "front")       //move forwards
    {
      digitalWrite(motorRightA, HIGH);
      digitalWrite(motorLeftA,  HIGH);
    }
    else if (voice == "back")       //move backwards
    {
      digitalWrite(motorRightB, HIGH);
      digitalWrite(motorLeftB, HIGH);
    }
    else if (voice == "stop")     //stop!
    {
      digitalWrite(motorRightA, LOW);
      digitalWrite(motorRightB, LOW);
      digitalWrite(motorLeftA, LOW);
      digitalWrite(motorLeftB, LOW);
    }
     else if (voice == "right")    //right
    {
      digitalWrite(motorRightA, HIGH);
      digitalWrite(motorRightB, LOW);
      digitalWrite(motorLeftA, LOW);
      digitalWrite(motorLeftB, LOW);
    }
        else if (voice == "left")    //right
    {
      digitalWrite(motorRightA, LOW);
      digitalWrite(motorRightB, LOW);
```

```
    digitalWrite(motorLeftA, HIGH);
    digitalWrite(motorLeftB, LOW);
  }
     else if (voice == "lights on")    //Lights on
  {
 digitalWrite(light, HIGH);
  }
     else if (voice == "lights off")    //Lights on
  {
 digitalWrite(light, LOW);
  }
    else if (voice == "alarm") {
  digitalWrite(buzzer, HIGH);
 }
    else if (voice == "reset") {
  digitalWrite(buzzer, LOW);
}

     else if (voice == "connect") {
  digitalWrite(buzzer, HIGH);
    digitalWrite(light, HIGH);
    delay(3000);
    digitalWrite(buzzer, LOW);
    digitalWrite(light, LOW);
}
}
```