APPENDIX

```
#include <LiquidCrystal.h>
LiquidCrystal lcd(11, 12, 13, 14, 15, 18);
int monitoring = 0;
int metalDetection = P1_4;
int sensor_pin = P1_3;
int output_value ;
const int trigPin = P1_0;
const int echoPin = P1_1;
long duration;
int motorPin1 = 9;
int motorPin2 = 10;
int nodemcu = P1_5;
void setup()
{
  lcd.begin(16, 2);
  lcd.clear();
  lcd.print("   WELCOME TO");
  lcd.setCursor(0, 1);
  lcd.print("   HYBRID BIN");
  delay(5000);
```

```
  lcd.clear();
  lcd.print("BIN SENSORS ARE");
  lcd.setCursor(0, 1);
  lcd.print("ACTIVATING...");
  delay(5000);
  pinMode(nodemcu, OUTPUT);
  digitalWrite(nodemcu, LOW);
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  Serial.begin(9600);
  pinMode(motorPin1, OUTPUT);
  pinMode(motorPin2, OUTPUT);
  digitalWrite(motorPin1, LOW);
  digitalWrite(motorPin2, LOW);
  lcd.clear();
  lcd.print("   THE BIN IS");
  lcd.setCursor(0, 1);
  lcd.print("   CONFIGURED");
  delay(5000);
}
void loop()
{
```

```
lcd.clear();
lcd.print("WAITING TO ACCEPT");
lcd.setCursor(0, 1);
lcd.print("THE WASTE");
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
duration = pulseIn(echoPin, HIGH);
Serial.println(duration);
delay(20);
digitalWrite(nodemcu, LOW);
if (duration < 5000)
{
  output_value = analogRead(sensor_pin);
  delay(3000);
  monitoring = analogRead(metalDetection);
  delay(3000);
  if (monitoring < 1000)//metal item
  {
    lcd.clear();
```

```
  lcd.print("YOU THROWN NON-");
  lcd.setCursor(0, 1);
  lcd.print("DEGRADDABLE WASTE");
  digitalWrite(motorPin1, HIGH);
  digitalWrite(motorPin2, LOW);
  delay(640);
  digitalWrite(motorPin1, LOW);
  digitalWrite(motorPin2, LOW);
  delay(3000);
  digitalWrite(motorPin1, LOW);
  digitalWrite(motorPin2, HIGH);
  delay(580);
  digitalWrite(motorPin1, LOW);
  digitalWrite(motorPin2, LOW);
  delay(3000);
  delay(2000);
  digitalWrite(nodemcu, HIGH);
  lcd.clear();
 }
if (output_value < 100)//metal  item
 {
  lcd.clear();
```

```
  lcd.print("YOU THROWN NON-");
  lcd.setCursor(0, 1);
  lcd.print("DEGRADABLE WASTE");
  digitalWrite(motorPin1, HIGH);
  digitalWrite(motorPin2, LOW);
  delay(640);
  digitalWrite(motorPin1, LOW);
  digitalWrite(motorPin2, LOW);
  delay(3000);
  digitalWrite(motorPin1, LOW);
  digitalWrite(motorPin2, HIGH);
  delay(580);
  digitalWrite(motorPin1, LOW);
  digitalWrite(motorPin2, LOW);
  delay(3000);
  delay(2000);
  digitalWrite(nodemcu, HIGH);
  lcd.clear();
 }
if (output_value < 1000 && output_value > 300) // food item
 {
  lcd.clear();
```

```
 lcd.clear();
 lcd.print("YOU THROWN");
 lcd.setCursor(0, 1);
 lcd.print("DEGRADABLE WASTE");
 digitalWrite(motorPin1, LOW);
 digitalWrite(motorPin2, HIGH);
 delay(640);
 digitalWrite(motorPin1, LOW);
 digitalWrite(motorPin2, LOW);
 delay(3000);
 digitalWrite(motorPin1, HIGH);
 digitalWrite(motorPin2, LOW);
 delay(580);
 digitalWrite(motorPin1, LOW);
 digitalWrite(motorPin2, LOW);
 delay(3000);
 delay(2000);
 digitalWrite(nodemcu, HIGH);
 lcd.clear();
}
if (output_value < 199 && monitoring < 1000) // metal with water
{
```

```
  lcd.clear();
  lcd.print("YOU THROWN NON-");
  lcd.setCursor(0, 1);
  lcd.print("DEGRADABLE WASTE");
  digitalWrite(motorPin1, HIGH);
  digitalWrite(motorPin2, LOW);
  delay(640);
  digitalWrite(motorPin1, LOW);
  digitalWrite(motorPin2, LOW);
  delay(3000);
  digitalWrite(motorPin1, LOW);
  digitalWrite(motorPin2, HIGH);
  delay(580);
  digitalWrite(motorPin1, LOW);
  digitalWrite(motorPin2, LOW);
  delay(3000);
  delay(2000);
  digitalWrite(nodemcu, HIGH);
  lcd.clear();
 }
if (output_value == 0) // metal
 {
```

```
 lcd.clear();
 lcd.print("YOU THROWN NON-");
 lcd.setCursor(0, 1);
 lcd.print("DEGRADABLE WASTE");
 digitalWrite(motorPin1, HIGH);
 digitalWrite(motorPin2, LOW);
 delay(640);
 digitalWrite(motorPin1, LOW);
 digitalWrite(motorPin2, LOW);
 delay(3000);
 digitalWrite(motorPin1, LOW);
 digitalWrite(motorPin2, HIGH);
 delay(580);
 digitalWrite(motorPin1, LOW);
 digitalWrite(motorPin2, LOW);
 delay(3000);
 delay(2000);
 digitalWrite(nodemcu, HIGH);
 lcd.clear();
}
if (output_value == 1023 && monitoring == 1023) // plastic
{
```

```
      lcd.clear();
      lcd.print("YOU THROWN NON-");
      lcd.setCursor(0, 1);
      lcd.print("DEGRADABLE WASTE");
      digitalWrite(motorPin1, HIGH);
      digitalWrite(motorPin2, LOW);
      delay(640);
      digitalWrite(motorPin1, LOW);
      digitalWrite(motorPin2, LOW);
      delay(3000);
      digitalWrite(motorPin1, LOW);
      digitalWrite(motorPin2, HIGH);
      delay(580);
      digitalWrite(motorPin1, LOW);
      digitalWrite(motorPin2, LOW);
      delay(3000);
      delay(2000);
      digitalWrite(nodemcu, HIGH);
      lcd.clear();
    }
  }
}
```