//First we declare all the variables

 long verticalDistance;

 long horizontalDistance;

 long vDuration;

 long hDuration;

 //Next we declare GPIOs with constants in order to make them easily changable

 const int trigpinVertical = 2;

 const int echopinVertical = 4;

 const int trigpinHorizontal = 8;

 const int echopinHorizontal = 11;

 const int vMotor = A2;

 const int buzzer = 13;

 void setup() {// code written inside this fucntion runs once, when the Microcontroller is powered on

 //Here we declare GPIOs with input or output as per our need

 pinMode(trigpinVertical, OUTPUT);

 pinMode(echopinVertical, INPUT);

 pinMode(vMotor, OUTPUT);

 pinMode(buzzer, OUTPUT);

 pinMode(trigpinHorizontal, OUTPUT);

 pinMode(echopinHorizontal, INPUT);

 Serial.begin(9600); // we initialize serial monitor in order to view the readings of the sensors when connected to computer

 }

 void loop() {//the code written inside this function rus repeatedly in a loop

 //here we set up the first ultrasonic sensor

 digitalWrite(trigpinVertical, LOW);

 delayMicroseconds(2);

 digitalWrite(trigpinVertical, HIGH);

 delayMicroseconds(10);

 digitalWrite(trigpinVertical, LOW);

 vDuration = pulseIn(echopinVertical, HIGH);

 verticalDistance= vDuration\*0.034/2;

 //here we set up the second ultrasonic sensor

 digitalWrite(trigpinHorizontal, LOW);

 delayMicroseconds(2);

 digitalWrite(trigpinHorizontal, HIGH);

 delayMicroseconds(10);

 digitalWrite(trigpinHorizontal, LOW);

 hDuration = pulseIn(echopinHorizontal, HIGH);

 horizontalDistance= hDuration\*0.034/2;

 //here we print in the sensor values into the serial monitor we earlier initialized

 Serial.print("Distance vertical: ");

 Serial.println(verticalDistance);

 Serial.print("Distance horizontal: ");

 Serial.println(horizontalDistance);

 if(horizontalDistance > 20 and horizontalDistance < 120){ //we write the first logic statement in order to detect pits and holes in front of the shoe and take an action accordingly

 digitalWrite(buzzer, HIGH);

 delay(250);

 digitalWrite(buzzer, LOW);

 delay(250);

 digitalWrite(vMotor, HIGH);

 delay(250);

 digitalWrite(vMotor, LOW);

 delay(250);

 }

 else if(verticalDistance < 80 and verticalDistance > 50){ //we write the second logic statement in order to detect obstacles in less than 1m range, but more than 50cm

 digitalWrite(buzzer, HIGH);

 delay(500);

 digitalWrite(buzzer, LOW);

 delay(500);

 digitalWrite(vMotor, LOW);

 }

 else if(verticalDistance < 50){ //we write the third logic statement in order to detect obstacles which are as close as 50cm

 digitalWrite(buzzer, HIGH);

 digitalWrite(vMotor, HIGH);

 }

 else{ //we tell the Microcontroller to shut everything down if there is neither a obstacle nor a pit in front of the shoe

 digitalWrite(buzzer, LOW);

 digitalWrite(vMotor, LOW);

 }

 }