// Touchless washing hands timer

#include <NewPing.h> // Library for sensor HC-SR04

const int trigger = 2; // D2 trigger Pin

const int echo = 3; // D3 echo Pin

const int max\_dist = 200; // max distance 200 cm

const int led = 13; // Build-in led

const int sonido = 12; // Buzzer pin

//D9 to pin 12 latch (RCLK) 74HC595

const int latchPin = 9;

//D10 to Pin 11 Clock (SRCLK) 74HC595

const int clockPin = 10;

//D8 to Pin 14 Data (SER) 74HC595

const int dataPin = 8;

const int tdigt1 = 4; // Transistor digit 1

const int tdigt2 = 5; // Transistor digit 2

//7Segment display configuration

const byte CHAR\_COUNT = 11;

const byte symbols[CHAR\_COUNT] = {

//GFEDCBAd

B01111110, // 0

B00001100, // 1

B10110110, // 2

B10011110, // 3

B11001100, // 4

B11011010, // 5

B11111010, // 6

B00001110, // 7

B11111110, // 8

B11011110, // 9

B10000000, // -

};

int dist = 0; // Distance variable

int var = 20; // Time varible. You can change this value.

int digt1 = 0; // Var digit 1

int digt2 = 0; // Var digit 2

NewPing sonar(trigger, echo, max\_dist); // NewPing constructor

void setup() {

Serial.begin(9600); // Set serial communication speed

pinMode(led, OUTPUT); // Led pin as output

pinMode(sonido, OUTPUT); // Sound pin as output

pinMode(latchPin, OUTPUT); // lachtPin as output

pinMode(dataPin, OUTPUT); // dataPin as output

pinMode(clockPin, OUTPUT); // clockPin as output

pinMode(tdigt1, OUTPUT); // tdigit1 as output

pinMode(tdigt2, OUTPUT); // tdigit2 as output

}

void loop() {

delay(50);

dist = sonar.ping\_cm(); // Get the distance.

Serial.print(dist); // Print distance in serial monitor.

Serial.println("cm");

delay(500);

// Start this cycle if the distance is less than 5 cm

if ((dist <= 5) & (dist > 0)) {

digitalWrite(led, HIGH);

beep(200); // Make a sound

while (var > 0){ // While cycle for counter

digt1 = var % 10; // Get the remainder

digt2 = var / 10; // Get first digit

for (int i=0; i<50; i++) { // Show every digit 10 ms.

digitalWrite(tdigt1, HIGH);

writeLeds(symbols[digt1]); // Write symbols in the displays.

delay(10);

digitalWrite(tdigt1, LOW);

digitalWrite(tdigt2, HIGH);

writeLeds(symbols[digt2]);

delay(10);

digitalWrite(tdigt2, LOW);

}

var--;

}

var = 20;

beep(200);

beep(200);

beep(200);

}

//If the sensor is not active.

else {

digitalWrite(led, LOW);

digitalWrite(tdigt1, HIGH);

writeLeds(symbols[10]);

digitalWrite(tdigt2, HIGH);

writeLeds(symbols[10]);

}

}

// beep function.

void beep(unsigned char delayms){

analogWrite(sonido, 200);

delay(delayms);

analogWrite(sonido, 0);

delay(delayms);

}

//writeleds function. Info https://www.arduino.cc/reference/en/language/functions/advanced-io/shiftout/

void writeLeds(byte pattern)

{

digitalWrite(latchPin, LOW);

shiftOut(dataPin, clockPin, MSBFIRST, pattern);

digitalWrite(latchPin, HIGH);

}