**Problem 2: Security surveillance.**

We need a system to detect and count the activities in a certain area.

**Hardware**:

* Motion sensor
* RGB
* 7 segments

**Requirements:**

1. A motion counter is initialized at 0.
2. The 7 segment should always display the value of the counter (initially 0).
3. When a motion is detected the counter should be incremented by one. The 7 segment display and the RGB led color should be updated if needed (check requirement 4).
4. Depending on the counter value the RGB led should change its color.
   1. Green if the counter is less than 4
   2. White if the counter is between 4 and 8
   3. Red if the counter is greater than 8
5. When the counter reaches 9 it will automatically be reset to 0.
6. When motion is detected and the counter is updated the program should wait for 30 seconds before checking for any new motion.

**Your Answer:**

int msensor = 13;

int val = 0 ;

int state = LOW;

int red = 9;

int green = 10;

int blue = 11;

int wait = 30000;

int count=0;

//a6

//b7f13g12c4d2e1

//RGB 0-255

int a = 8; //For displaying segment "a“

int b = 7; //For displaying segment "b"

int c = 4; //For displaying segment "c"

int d = 5; //For displaying segment "d"

int e = 6; //For displaying segment "e"

int f = 2; //For displaying segment "f“

int g = 12; //For displaying segment "g“

void setup() {

// put your setup code here, to run once:

pinMode(msensor,INPUT);

Serial.begin(9600);

pinMode(red,OUTPUT);

pinMode(green,OUTPUT);

pinMode(blue,OUTPUT);

pinMode(a, OUTPUT); //A

pinMode(b, OUTPUT); //B

pinMode(c, OUTPUT); //C

pinMode(d, OUTPUT); //D

pinMode(e, OUTPUT); //E

pinMode(f, OUTPUT); //F

pinMode(g, OUTPUT); //G

displayDigit(count);

}

void loop() {

val = digitalRead(msensor);

if (val == HIGH) { // check if the sensor is HIGH

Serial.println("Added One");

count ++;

if(count>9){

count = 0 ;

Serial.println("Count>9,restarting count");

}

check(count);

turnOff();

displayDigit(count);

Serial.println(count);

if (state == LOW) {

Serial.println("Motion detected!");

state = HIGH; // update variable state to HIGH

}

delay(wait); // delay 30 seconds

}

else {

Serial.println("No Motion");

if (state==HIGH){

Serial.println("Motion stopped!");

state==LOW;

}

}

}

void RGB(int r , int g , int b){

digitalWrite(9, r);

digitalWrite(10, g);

digitalWrite(11, b);

}

void displayDigit(int digit) {

//Conditions for displaying segment a

if(digit!=1 && digit != 4)

digitalWrite(a,HIGH);

//Conditions for displaying segment b

if(digit != 5 && digit != 6)

digitalWrite(b,HIGH);

//Conditions for displaying segment c

if(digit !=2)

digitalWrite(c,HIGH);

//Conditions for displaying segment d

if(digit != 1 && digit !=4 && digit !=7)

digitalWrite(d,HIGH);

//Conditions for displaying segment e

if(digit == 2 || digit ==6 || digit == 8 || digit==0)

digitalWrite(e,HIGH);

//Conditions for displaying segment f

if(digit != 1 && digit !=2 && digit!=3 && digit !=7)

digitalWrite(f,HIGH);

if (digit!=0 && digit!=1 && digit !=7)

digitalWrite(g,HIGH);

}

void turnOff(){

digitalWrite(a,LOW);

digitalWrite(b,LOW);

digitalWrite(c,LOW);

digitalWrite(d,LOW);

digitalWrite(e,LOW);

digitalWrite(f,LOW);

digitalWrite(g,LOW);

}

void check(int val){

if(val<4){

RGB(0,255,0);

}

else if(val>=4 && val<8){

RGB(255,255,255);

}

else if(val>8){

RGB(255,0,0);

}

}