#include <Wire.h>

#include <LiquidCrystal\_I2C.h>

LiquidCrystal\_I2C lcd(0x27,16,2);

#define in1 2

#define out1 3

#define in2 4

#define out2 5

#define in3 6

#define out3 7

#define in4 8

#define out4 9

#define R1 34

#define Y1 36

#define G1 38

#define R2 40

#define Y2 42

#define G2 44

#define R3 22

#define Y3 24

#define G3 26

#define R4 28

#define Y4 30

#define G4 32

char ch;

int count1=0;

int count2=0;

int count3=0;

int count4=0;

void IN\_1()

{

count1++;

Serial.print("VEHICLE IN ROAD1:");

Serial.println(count1);

delay(1000);

serialEvent();

}

void OUT\_1()

{

count1--;

if(count1<0)

count1=0;

Serial.print("VEHICLE IN ROAD1:");

Serial.println(count1);

delay(1000);

serialEvent();

}

void IN\_2()

{

count2++;

Serial.print("VEHICLE IN ROAD2:");

Serial.println(count2);

delay(1000);

serialEvent();

}

void OUT\_2()

{

count2--;

if(count2<0)

count2=0;

Serial.print("VEHICLE IN ROAD2:");

Serial.println(count2);

delay(1000);

serialEvent();

}

void IN\_3()

{

count3++;

Serial.print("VEHICLE IN ROAD3:");

Serial.println(count3);

delay(1000);

serialEvent();

}

void OUT\_3()

{

count3--;

if(count3<0)

count3=0;

Serial.print("VEHICLE IN ROAD3:");

Serial.println(count3);

delay(1000);

serialEvent();

}

void IN\_4()

{

count4++;

Serial.print("VEHICLE IN ROAD4:");

Serial.println(count4);

delay(1000);

serialEvent();

}

void OUT\_4()

{

count4--;

if(count4<0)

count4=0;

Serial.print("VEHICLE IN ROAD4:");

Serial.println(count4);

delay(1000);

serialEvent();

}

void setup()

{

lcd.init();

lcd.backlight();

lcd.clear();

pinMode(in1, INPUT);

pinMode(in2, INPUT);

pinMode(in3, INPUT);

pinMode(in4, INPUT);

// pinMode(SOUND, INPUT);

pinMode(out1, INPUT);

pinMode(out2, INPUT);

pinMode(out3, INPUT);

pinMode(out4, INPUT);

pinMode(R1, OUTPUT);

pinMode(Y1, OUTPUT);

pinMode(G1, OUTPUT);

pinMode(R2, OUTPUT);

pinMode(Y2, OUTPUT);

pinMode(G2, OUTPUT);

pinMode(R3, OUTPUT);

pinMode(Y3, OUTPUT);

pinMode(G3, OUTPUT);

pinMode(R4, OUTPUT);

pinMode(Y4, OUTPUT);

pinMode(G4, OUTPUT);

Serial.begin(9600);

Serial1.begin(9600);

Serial.println("TRAFFIC MANAGEMENT");

lcd.clear();

lcd.setCursor(0,0);

lcd.print(" TRAFFIC ");

lcd.setCursor(0,1);

lcd.print(" MANAGEMENT ");

delay(1000);

Serial.print("VEHICLE IN ROAD1:");

Serial.println(count1);

Serial.print("VEHICLE IN ROAD2:");

Serial.println(count2);

Serial.print("VEHICLE IN ROAD3:");

Serial.println(count3);

Serial.print("VEHICLE IN ROAD4:");

Serial.println(count4);

}

void loop()

{

if(digitalRead(in1)==LOW)

IN\_1();

if(digitalRead(out1)==LOW)

OUT\_1();

if(digitalRead(in2)==LOW)

IN\_2();

if(digitalRead(out2)==LOW)

OUT\_2();

if(digitalRead(in3)==LOW)

IN\_3();

if(digitalRead(out3)==LOW)

OUT\_3();

if(digitalRead(in4)==LOW)

IN\_4();

if(digitalRead(out4)==LOW)

OUT\_4();

lcd.clear();

lcd.setCursor(0,0);

lcd.print("R1=");

lcd.setCursor(4,0);

lcd.print(count1);

lcd.setCursor(8,0);

lcd.print("R2=");

lcd.setCursor(11,0);

lcd.print(count2);

lcd.setCursor(0,1);

lcd.print("R3=");

lcd.setCursor(4,1);

lcd.print(count3);

lcd.setCursor(8,1);

lcd.print("R4=");

lcd.setCursor(11,1);

lcd.print(count4);

delay(1000);

if((count1<=0)&&(count2<=0)&&(count3<=0)&&(count4<=0))

{

ALL\_RED();

}

if((count1>count2)&&(count1>count3)&&(count1>count4))

{

road1();

}

if((count2>count1)&&(count2>count3)&&(count2>count4))

{

road2();

}

if((count3>count1)&&(count3>count2)&&(count3>count4))

{

road3();

}

if((count4>count1)&&(count4>count2)&&(count4>count3))

{

road4();

}

serialEvent();

}

void serialEvent()

{

int i=0;

for(i=0;i<10;i++)

{

if(Serial1.available()>0)

{

ch=Serial1.read();

Serial.println(ch);

if(ch=='A')

{

lcd.clear();

lcd.print("Road1 Ambulance");

delay(1000);

road11();

}

if(ch=='B')

{

lcd.clear();

lcd.print("Road2 Ambulance");

delay(1000);

road22();

}

if(ch=='C')

{

lcd.clear();

lcd.print("Road3 Ambulance");

delay(1000);

road33();

}

if(ch=='D')

{

lcd.clear();

lcd.print("Road4 Ambulance");

delay(1000);

road44();

}

}

}

}

void ALL\_RED()

{

Serial.println("ALL RED");

// lcd.clear();

// lcd.setCursor(0,0);

// lcd.print("ALL RED");

//delay(300);

digitalWrite(R1, HIGH);

digitalWrite(R2,HIGH);

digitalWrite(R3, HIGH);

digitalWrite(R4, HIGH);

digitalWrite(Y1, LOW);

digitalWrite(Y2, LOW);

digitalWrite(Y3, LOW);

digitalWrite(Y4, LOW);

digitalWrite(G1, LOW);

digitalWrite(G2, LOW);

digitalWrite(G3, LOW);

digitalWrite(G4, LOW);

// road1();

// road2();

// road3();

// road4();

}

void road1(void)

{

digitalWrite(R1, LOW);

digitalWrite(Y1, HIGH);

delay(1000);

digitalWrite(Y1, LOW);

delay(1000);

digitalWrite(G1, HIGH);

delay(1000);

digitalWrite(Y1, HIGH);

delay(1000);

digitalWrite(Y1,LOW);

digitalWrite(R1, HIGH);

serialEvent();

}

void road2(void)

{

digitalWrite(R1, HIGH);

digitalWrite(Y1, LOW);

digitalWrite(G1, LOW);

digitalWrite(R2, LOW);

digitalWrite(Y2, HIGH);

delay(1000);

digitalWrite(Y2, LOW);

digitalWrite(G2, HIGH);

delay(1000);

digitalWrite(G2, LOW);

delay(1000);

digitalWrite(Y2, HIGH);

delay(1000);

digitalWrite(Y2, LOW);

digitalWrite(R2, HIGH);

// digitalWrite(R3, HIGH);

// digitalWrite(Y3, LOW);

// digitalWrite(G3, LOW);

// digitalWrite(R4, HIGH);

// digitalWrite(Y4, LOW);

// digitalWrite(G4, LOW);

serialEvent();

}

void road3(void)

{

digitalWrite(R1, HIGH);

digitalWrite(Y1, LOW);

digitalWrite(G1, LOW);

digitalWrite(R2, HIGH);

digitalWrite(Y2, LOW);

digitalWrite(G2, LOW);

digitalWrite(R3, LOW);

digitalWrite(Y3, HIGH);

delay(1000);

digitalWrite(Y3, LOW);

delay(1000);

digitalWrite(G3, HIGH);

delay(1000);

digitalWrite(G3, LOW);

delay(1000);

digitalWrite(Y3, HIGH);

delay(1000);

digitalWrite(Y3, LOW);

delay(1000);

digitalWrite(R3, HIGH);

// digitalWrite(R4, HIGH);

// digitalWrite(Y4, LOW);

// digitalWrite(G4, LOW);

serialEvent();

//ALL\_RED();

}

void road4(void)

{

digitalWrite(R1, HIGH);

digitalWrite(Y1, LOW);

digitalWrite(G1, LOW);

digitalWrite(R2, HIGH);

digitalWrite(Y2, LOW);

digitalWrite(G2, LOW);

digitalWrite(R3, HIGH);

digitalWrite(Y3, LOW);

digitalWrite(G3, LOW);

digitalWrite(R4, LOW);

digitalWrite(Y4, HIGH);

delay(1000);

digitalWrite(Y4, LOW);

delay(1000);

digitalWrite(G4, HIGH);

delay(1000);

digitalWrite(G4, LOW);

delay(1000);

digitalWrite(Y4, HIGH);

delay(1000);

digitalWrite(Y4, LOW);

digitalWrite(R4, HIGH);

serialEvent();

}

void road11()

{

Serial.println("11111");

digitalWrite(R1, LOW);

digitalWrite(Y1, HIGH);

delay(3000);

digitalWrite(Y1, LOW);

digitalWrite(G1, HIGH);

delay(5000);

digitalWrite(G1, LOW);

digitalWrite(Y1, HIGH);

delay(1000);

digitalWrite(Y1,LOW);

digitalWrite(R1, HIGH);

}

void road22()

{

Serial.println("22222");

digitalWrite(R1, HIGH);

digitalWrite(Y1, LOW);

digitalWrite(G1, LOW);

digitalWrite(R2, LOW);

digitalWrite(Y2, HIGH);

delay(3000);

digitalWrite(Y2, LOW);

digitalWrite(G2, HIGH);

delay(5000);

digitalWrite(G2, LOW);

delay(1000);

digitalWrite(Y2, HIGH);

delay(1000);

digitalWrite(Y2, LOW);

digitalWrite(R2, HIGH);

}

void road33()

{

Serial.println("333333");

digitalWrite(R1, HIGH);

digitalWrite(Y1, LOW);

digitalWrite(G1, LOW);

digitalWrite(R2, HIGH);

digitalWrite(Y2, LOW);

digitalWrite(G2, LOW);

digitalWrite(R3, LOW);

digitalWrite(Y3, HIGH);

delay(3000);

digitalWrite(Y3, LOW);

delay(1000);

digitalWrite(G3, HIGH);

delay(5000);

digitalWrite(G3, LOW);

delay(1000);

digitalWrite(Y3, HIGH);

delay(1000);

digitalWrite(Y3, LOW);

delay(1000);

digitalWrite(R3, HIGH);

}

void road44()

{

Serial.println("4444");

digitalWrite(R1, HIGH);

digitalWrite(Y1, LOW);

digitalWrite(G1, LOW);

digitalWrite(R2, HIGH);

digitalWrite(Y2, LOW);

digitalWrite(G2, LOW);

digitalWrite(R3, HIGH);

digitalWrite(Y3, LOW);

digitalWrite(G3, LOW);

digitalWrite(R4, LOW);

digitalWrite(Y4, HIGH);

delay(3000);

digitalWrite(Y4, LOW);

delay(1000);

digitalWrite(G4, HIGH);

delay(5000);

digitalWrite(G4, LOW);

delay(1000);

digitalWrite(Y4, HIGH);

delay(1000);

digitalWrite(Y4, LOW);

digitalWrite(R4, HIGH);

}