Traffic Management

**Wokwi Project:**

Downloaded from https://wokwi.com/projects/379653947778059265

**Simulate this project on https://wokwi.com**

**Sketch.INO:**

#include <TimerOne.h>

#include<ThingSpeak.h>

char ssid[]=”Wokwi-Guest”;

char pass[]=””;

WiFiClient client;

Unsigned long mychannelID=2324457;

const char\* writeAPIKey=”V10H51I89A5Q1DYR”;

const char\* server=”api.thingspeak.com”;

const int updateInterval=15000;

int signal1[] = {23, 25, 27};

int signal2[] = {46, 48, 50};

int signal3[] = {13, 12, 11};

int signal4[] = {10, 9, 8};

int redDelay = 5000;

int yellowDelay = 2000;

volatile int triggerpin1 = 31;

volatile int echopin1 = 29;

volatile int triggerpin2 = 44;

volatile int echopin2 = 42;

volatile int triggerpin3 = 7;

volatile int echopin3 = 6;

volatile int triggerpin4 = 5;

volatile int echopin4 = 4;

volatile long time; // Variable for storing the time traveled

volatile int S1, S2, S3, S4; // Variables for storing the distance covered

int t = 5; // distance under which it will look for vehicles.

void setup(){

Serial.begin(115200);

Timer1.initialize(100000); //Begin using the timer. This function must be called first. "microseconds" is the period of time the timer takes.

Timer1.attachInterrupt(softInterr); //Run a function each time the timer period finishes.

// Declaring LED pins as output

for(int i=0; i<3; i++){

pinMode(signal1[i], OUTPUT);

pinMode(signal2[i], OUTPUT);

pinMode(signal3[i], OUTPUT);

pinMode(signal4[i], OUTPUT);

}

// Declaring ultrasonic sensor pins as output

pinMode(triggerpin1, OUTPUT);

pinMode(echopin1, INPUT);

pinMode(triggerpin2, OUTPUT);

pinMode(echopin2, INPUT);

pinMode(triggerpin3, OUTPUT);

pinMode(echopin3, INPUT);

pinMode(triggerpin4, OUTPUT);

pinMode(echopin4, INPUT);

}

void loop()

{

// If there are vehicles at signal 1

if(S1<t)

{

signal1Function();

}

// If there are vehicles at signal 2

if(S2<t)

{

signal2Function();

}

// If there are vehicles at signal 3

if(S3<t)

{

signal3Function();

}

// If there are vehicles at signal 4

if(S4<t)

{

signal4Function();

}

}

// This is interrupt function and it will run each time the timer period finishes. The timer period is set at 100 milli seconds.

void softInterr()

{

// Reading from first ultrasonic sensor

digitalWrite(triggerpin1, LOW);

delayMicroseconds(2);

digitalWrite(triggerpin1, HIGH);

delayMicroseconds(10);

digitalWrite(triggerpin1, LOW);

time = pulseIn(echopin1, HIGH);

S1= time\*0.034/2;

// Reading from second ultrasonic sensor

digitalWrite(triggerpin2, LOW);

delayMicroseconds(2);

digitalWrite(triggerpin2, HIGH);

delayMicroseconds(10);

digitalWrite(triggerpin2, LOW);

time = pulseIn(echopin2, HIGH);

S2= time\*0.034/2;

// Reading from third ultrasonic sensor

digitalWrite(triggerpin3, LOW);

delayMicroseconds(2);

digitalWrite(triggerpin3, HIGH);

delayMicroseconds(10);

digitalWrite(triggerpin3, LOW);

time = pulseIn(echopin3, HIGH);

S3= time\*0.034/2;

// Reading from fourth ultrasonic sensor

digitalWrite(triggerpin4, LOW);

delayMicroseconds(2);

digitalWrite(triggerpin4, HIGH);

delayMicroseconds(10);

digitalWrite(triggerpin4, LOW);

time = pulseIn(echopin4, HIGH);

S4= time\*0.034/2;

// Print distance values on serial monitor for debugging

Serial.print("S1: ");

Serial.print(S1);

Serial.print(" S2: ");

Serial.print(S2);

Serial.print(" S3: ");

Serial.print(S3);

Serial.print(" S4: ");

Serial.println(S4);

}

void signal1Function()

{

Serial.println("1");

low();

// Make RED LED LOW and make Green HIGH for 5 seconds

digitalWrite(signal1[0], LOW);

digitalWrite(signal1[2], HIGH);

delay(redDelay);

// if there are vehicels at other signals

if(S2<t || S3<t || S4<t)

{

// Make Green LED LOW and make yellow LED HIGH for 2 seconds

digitalWrite(signal1[2], LOW);

digitalWrite(signal1[1], HIGH);

delay(yellowDelay);

}

}

void signal2Function()

{

Serial.println("2");

low();

digitalWrite(signal2[0], LOW);

digitalWrite(signal2[2], HIGH);

delay(redDelay);

if(S1<t || S3<t || S4<t)

{

digitalWrite(signal2[2], LOW);

digitalWrite(signal2[1], HIGH);

delay(yellowDelay);

}

}

void signal3Function()

{

Serial.println("3");

low();

digitalWrite(signal3[0], LOW);

digitalWrite(signal3[2], HIGH);

delay(redDelay);

if(S1<t || S2<t || S4<t)

{

digitalWrite(signal3[2], LOW);

digitalWrite(signal3[1], HIGH);

delay(yellowDelay);

}

}

void signal4Function()

{

Serial.println("4");

low();

digitalWrite(signal4[0], LOW);

digitalWrite(signal4[2], HIGH);

delay(redDelay);

if(S1<t || S2<t || S3<t)

{

digitalWrite(signal4[2], LOW);

digitalWrite(signal4[1], HIGH);

delay(yellowDelay);

}

}

// Function to make all LED's LOW except RED one's.

void low()

{

for(int i=1; i<3; i++)

{

digitalWrite(signal1[i], LOW);

digitalWrite(signal2[i], LOW);

digitalWrite(signal3[i], LOW);

digitalWrite(signal4[i], LOW);

}

for(int i=0; i<1; i++)

{

digitalWrite(signal1[i], HIGH);

digitalWrite(signal2[i], HIGH);

digitalWrite(signal3[i], HIGH);

digitalWrite(signal4[i], HIGH);

}

}

**Diagram.json:**

{

"version": 1,

"author": “ Asuvathi N “

"editor": "wokwi",

"parts": [

{ "type": "wokwi-breadboard-mini", "id": "bb1", "top": -135.8, "left": 285.6, "attrs": {} },

{ "type": "wokwi-breadboard-mini", "id": "bb2", "top": 46.6, "left": 612, "attrs": {} },

{ "type": "wokwi-breadboard-mini", "id": "bb3", "top": 37, "left": -31.2, "attrs": {} },

{ "type": "wokwi-breadboard-mini", "id": "bb4", "top": 238.6, "left": 295.2, "attrs": {} },

{ "type": "wokwi-arduino-mega", "id": "mega", "top": 10.2, "left": 178.8, "attrs": {} },

{

"type": "wokwi-led",

"id": "led1",

"top": 15.6,

"left": 704.6,

"attrs": { "color": "green" }

},

{

"type": "wokwi-led",

"id": "led2",

"top": 15.6,

"left": 666.2,

"attrs": { "color": "yellow" }

},

{ "type": "wokwi-led", "id": "led3", "top": 15.6, "left": 627.8, "attrs": { "color": "red" } },

{

"type": "wokwi-led",

"id": "led4",

"top": 206.5,

"left": 388.59,

"attrs": { "color": "green" }

},

{

"type": "wokwi-led",

"id": "led5",

"top": 207.6,

"left": 349.4,

"attrs": { "color": "yellow" }

},

{ "type": "wokwi-led", "id": "led6", "top": 207.6, "left": 311, "attrs": { "color": "red" } },

{ "type": "wokwi-led", "id": "led7", "top": 6, "left": 61.4, "attrs": { "color": "green" } },

{

"type": "wokwi-led",

"id": "led8",

"top": 4.8,

"left": 23.79,

"attrs": { "color": "yellow" }

},

{ "type": "wokwi-led", "id": "led9", "top": 6, "left": -15.4, "attrs": { "color": "red" } },

{

"type": "wokwi-led",

"id": "led10",

"top": -166.8,

"left": 378.2,

"attrs": { "color": "green" }

},

{

"type": "wokwi-led",

"id": "led11",

"top": -167.35,

"left": 340.45,

"attrs": { "color": "yellow" }

},

{

"type": "wokwi-led",

"id": "led12",

"top": -166.8,

"left": 301.4,

"attrs": { "color": "red" }

},

{

"type": "wokwi-hc-sr04",

"id": "ultrasonic1",

"top": -35.8,

"left": 747.2,

"rotate": 90,

"attrs": { "distance": "400" }

},

{

"type": "wokwi-hc-sr04",

"id": "ultrasonic2",

"top": -80.33,

"left": -184.06,

"rotate": 270,

"attrs": { "distance": "400" }

},

{

"type": "wokwi-hc-sr04",

"id": "ultrasonic3",

"top": -151.36,

"left": 472.77,

"attrs": { "distance": "2" }

},

{

"type": "wokwi-hc-sr04",

"id": "ultrasonic4",

"top": 293.93,

"left": 481.69,

"rotate": 180,

"attrs": { "distance": "400" }

},

{

"type": "wokwi-resistor",

"id": "r1",

"top": -96.2,

"left": 286.8,

"rotate": 90,

"attrs": { "value": "1000" }

},

{

"type": "wokwi-resistor",

"id": "r2",

"top": 76.6,

"left": 46.8,

"rotate": 90,

"attrs": { "value": "1000" }

},

{

"type": "wokwi-resistor",

"id": "r3",

"top": 76.6,

"left": 8.4,

"rotate": 90,

"attrs": { "value": "1000" }

},

{

"type": "wokwi-resistor",

"id": "r4",

"top": 76.6,

"left": -30,

"rotate": 90,

"attrs": { "value": "1000" }

},

{

"type": "wokwi-resistor",

"id": "r5",

"top": 278.2,

"left": 334.8,

"rotate": 90,

"attrs": { "value": "1000" }

},

{

"type": "wokwi-resistor",

"id": "r6",

"top": 278.2,

"left": 296.4,

"rotate": 90,

"attrs": { "value": "1000" }

},

{

"type": "wokwi-resistor",

"id": "r7",

"top": -96.2,

"left": 363.6,

"rotate": 90,

"attrs": { "value": "1000" }

},

{

"type": "wokwi-resistor",

"id": "r8",

"top": -96.2,

"left": 325.2,

"rotate": 90,

"attrs": { "value": "1000" }

},

{

"type": "wokwi-resistor",

"id": "r9",

"top": 86.2,

"left": 690,

"rotate": 90,

"attrs": { "value": "1000" }

},

{

"type": "wokwi-resistor",

"id": "r10",

"top": 86.2,

"left": 651.6,

"rotate": 90,

"attrs": { "value": "1000" }

},

{

"type": "wokwi-resistor",

"id": "r11",

"top": 86.2,

"left": 613.2,

"rotate": 90,

"attrs": { "value": "1000" }

},

{

"type": "wokwi-resistor",

"id": "r12",

"top": 278.2,

"left": 373.2,

"rotate": 90,

"attrs": { "value": "1000" }

},

{

"type": "wokwi-vcc",

"id": "vcc1",

"top": 286.17,

"left": 174.56,

"rotate": 180,

"attrs": {}

},

{ "type": "wokwi-gnd", "id": "gnd1", "top": 288.93, "left": 219.56, "attrs": {} }

],

"connections": [

[ "led4:A", "bb4:12t.a", "", [ "$bb" ] ],

[ "led4:C", "bb4:11t.a", "", [ "$bb" ] ],

[ "led3:A", "bb2:4t.a", "", [ "$bb" ] ],

[ "led3:C", "bb2:3t.a", "", [ "$bb" ] ],

[ "led1:A", "bb2:12t.a", "", [ "$bb" ] ],

[ "led1:C", "bb2:11t.a", "", [ "$bb" ] ],

[ "bb3:3b.g", "bb3:7b.g", "green", [ "v0.43", "h37.7" ] ],

[ "bb3:11b.g", "bb3:7b.g", "green", [ "v0" ] ],

[ "r6:1", "bb4:3t.b", "", [ "$bb" ] ],

[ "r6:2", "bb4:3b.f", "", [ "$bb" ] ],

[ "r5:1", "bb4:7t.b", "", [ "$bb" ] ],

[ "r5:2", "bb4:7b.f", "", [ "$bb" ] ],

[ "r12:1", "bb4:11t.b", "", [ "$bb" ] ],

[ "r12:2", "bb4:11b.f", "", [ "$bb" ] ],

[ "r9:1", "bb2:11t.b", "", [ "$bb" ] ],

[ "r9:2", "bb2:11b.f", "", [ "$bb" ] ],

[ "bb1:3b.g", "bb1:7b.g", "green", [ "v0" ] ],

[ "bb1:11b.g", "bb1:7b.g", "green", [ "v1.35", "h-38.45" ] ],

[ "bb4:3b.g", "bb4:7b.g", "green", [ "v1.4", "h38.39" ] ],

[ "bb4:11b.g", "bb4:7b.g", "green", [ "v0" ] ],

[ "bb2:3b.g", "bb2:7b.g", "green", [ "v0" ] ],

[ "bb2:11b.g", "bb2:7b.g", "green", [ "v0.48", "h-38.63" ] ],

[ "ultrasonic2:GND", "bb3:7b.i", "black", [ "h157.64", "v3.11" ] ],

[ "bb3:7b.i", "mega:GND.2", "black", [ "v63.66", "h314.23" ] ],

[ "ultrasonic4:GND", "bb4:7b.h", "black", [ "v-17.98", "h-76.75", "v0" ] ],

[ "bb4:7b.h", "mega:GND.3", "black", [ "v1.45", "h-85.84", "v-126.28", "h82.43" ] ],

[ "ultrasonic1:GND", "bb2:7b.h", "black", [ "h-33.82", "v118.03" ] ],

[ "bb2:7b.h", "mega:GND.5", "black", [ "v0" ] ],

[ "ultrasonic3:GND", "bb1:7b.h", "black", [ "v0" ] ],

[ "bb1:7b.h", "mega:GND.1", "black", [ "v40.86", "h-62.2" ] ],

[ "bb1:4t.b", "mega:10", "violet", [ "v108.89", "h9.56" ] ],

[ "bb1:8t.b", "mega:9", "gold", [ "v107.14", "h-20.94" ] ],

[ "led12:A", "bb1:4t.a", "", [ "$bb" ] ],

[ "led12:C", "bb1:3t.a", "", [ "$bb" ] ],

[ "led11:A", "bb1:8t.a", "", [ "$bb" ] ],

[ "led11:C", "bb1:7t.a", "", [ "$bb" ] ],

[ "r7:1", "bb1:11t.b", "", [ "$bb" ] ],

[ "r7:2", "bb1:11b.f", "", [ "$bb" ] ],

[ "r1:1", "bb1:3t.b", "", [ "$bb" ] ],

[ "r1:2", "bb1:3b.f", "", [ "$bb" ] ],

[ "r8:1", "bb1:7t.b", "", [ "$bb" ] ],

[ "r8:2", "bb1:7b.f", "", [ "$bb" ] ],

[ "bb1:12t.b", "mega:8", "green", [ "v110.64", "h-42.68" ] ],

[ "led10:A", "bb1:12t.a", "", [ "$bb" ] ],

[ "led10:C", "bb1:11t.a", "", [ "$bb" ] ],

[ "bb3:8t.b", "mega:12", "gold", [ "v-57.77", "h88.02" ] ],

[ "bb3:12t.b", "mega:11", "green", [ "v-61.28", "h238.16" ] ],

[ "led8:A", "bb3:8t.a", "", [ "$bb" ] ],

[ "led8:C", "bb3:7t.a", "", [ "$bb" ] ],

[ "led7:A", "bb3:12t.a", "", [ "$bb" ] ],

[ "led7:C", "bb3:11t.a", "", [ "$bb" ] ],

[ "r3:1", "bb3:7t.b", "", [ "$bb" ] ],

[ "r3:2", "bb3:7b.f", "", [ "$bb" ] ],

[ "r2:1", "bb3:11t.b", "", [ "$bb" ] ],

[ "r2:2", "bb3:11b.f", "", [ "$bb" ] ],

[ "led9:A", "bb3:4t.a", "", [ "$bb" ] ],

[ "led9:C", "bb3:3t.a", "", [ "$bb" ] ],

[ "bb2:4t.b", "mega:23", "violet", [ "v-64.74", "h-86.2", "v21.05" ] ],

[ "led2:A", "bb2:8t.a", "", [ "$bb" ] ],

[ "led2:C", "bb2:7t.a", "", [ "$bb" ] ],

[ "r11:1", "bb2:3t.b", "", [ "$bb" ] ],

[ "r11:2", "bb2:3b.f", "", [ "$bb" ] ],

[ "r10:1", "bb2:7t.b", "", [ "$bb" ] ],

[ "r10:2", "bb2:7b.f", "", [ "$bb" ] ],

[ "bb2:12t.b", "mega:27", "green", [ "v-62.11", "h-155.11", "v41.86" ] ],

[ "bb2:8t.b", "mega:25", "gold", [ "v0" ] ],

[ "bb3:4t.b", "mega:13", "magenta", [ "v-65.66", "h295.67" ] ],

[ "r4:1", "bb3:3t.b", "", [ "$bb" ] ],

[ "r4:2", "bb3:3b.f", "", [ "$bb" ] ],

[ "ultrasonic2:ECHO", "mega:6", "blue", [ "h127.82", "v24.68", "h303.42" ] ],

[ "ultrasonic2:TRIG", "mega:7", "orange", [ "h0" ] ],

[ "ultrasonic2:VCC", "mega:IOREF", "red", [ "h151.5", "v236.19", "h215.72" ] ],

[ "ultrasonic3:VCC", "mega:5V.1", "red", [ "v0" ] ],

[ "ultrasonic3:ECHO", "mega:4", "blue", [ "v57.56", "h-169.35" ] ],

[ "ultrasonic3:TRIG", "mega:5", "red", [ "v42.66", "h-165.49" ] ],

[ "ultrasonic1:VCC", "mega:5V.2", "red", [ "h-9.26", "v-8.94", "h-227.13" ] ],

[ "ultrasonic1:TRIG", "mega:31", "orange", [ "h-201.31", "v54.72" ] ],

[ "ultrasonic1:ECHO", "mega:29", "blue", [ "h-209.2", "v30.69" ] ],

[ "ultrasonic4:VCC", "mega:5V", "red", [ "v-94.28", "h-237.41" ] ],

[ "ultrasonic4:TRIG", "mega:44", "orange", [ "v-10.97", "h12.87", "v-151.71" ] ],

[ "led6:A", "bb4:4t.a", "", [ "$bb" ] ],

[ "led6:C", "bb4:3t.a", "", [ "$bb" ] ],

[ "bb4:12t.b", "mega:50", "green", [ "v-3.31", "h109.35", "v-94.71", "h17.65" ] ],

[ "bb4:4t.b", "mega:46", "violet", [ "v11.6", "h181.76", "v-131.54" ] ],

[ "led5:A", "bb4:8t.a", "", [ "$bb" ] ],

[ "led5:C", "bb4:7t.a", "", [ "$bb" ] ],

[ "bb4:8t.b", "mega:48", "gold", [ "v-11.2", "h153.01", "v-98.22" ] ],

[ "ultrasonic4:ECHO", "mega:42", "blue", [ "v-175.83", "h2.09" ] ],

[ "gnd1:GND", "mega:GND.2", "black", [ "v-88.29", "h124.01" ] ],

[ "vcc1:VCC", "mega:VIN", "red", [ "v-109.9", "h185.6" ] ]

]

}

**Libraries:**

# Wokwi Library List

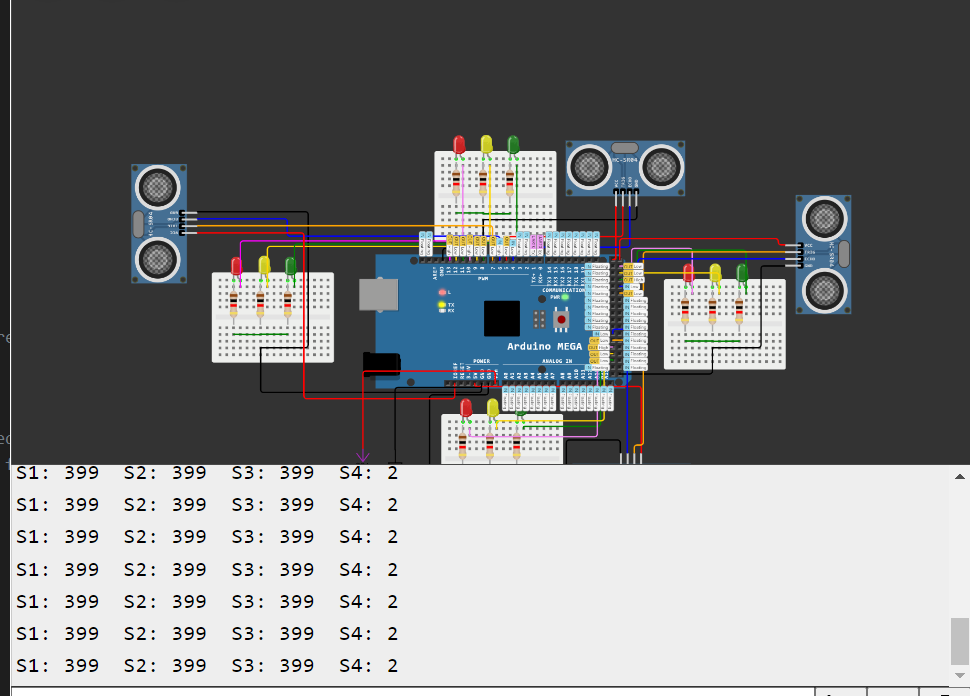
# See https://docs.wokwi.com/guides/libraries

Timer One

ThingSpeak

WiFi

**Simulation:**

****

