2 WAY TRAFFIC NAVIGATION SYSYTEM

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ARDUINO Project

A Project Submitted in Partial Fullfillment of the Requirements for the Degree of Bachelors of Science in Physics.

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Abstract

The ARDUINO project demonstrates the function of a two way traffic navigation system using LEDs and 7 segment display. In this project we learn about the counter using LEDs.In this project we learn about the fundamental of Traffic sysytem ,and how they work.In this project we learned how to control LED and 7 segment display with arduino uno.

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Introduction

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Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.

The Arduino board can be programmed to do anything by simply programming the microcontroller on board using a set of instructions for which, the Arduino board consists of a USB plug to communicate with your computer and a bunch of connection sockets that can be wired to external devices like motors, LEDs etc.Arduino is based on open source electronics project i.e. all the design specifications, schematics, software are available openly to all the users. .

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Figure 1: Red And Green Led

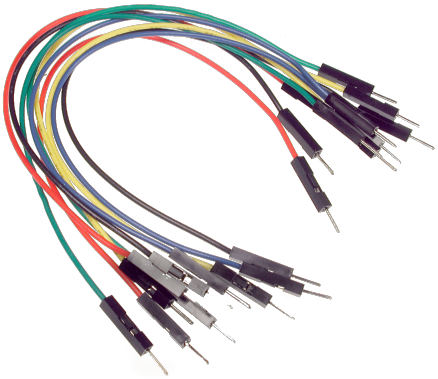

Figure 2: Male to male jumper wires.

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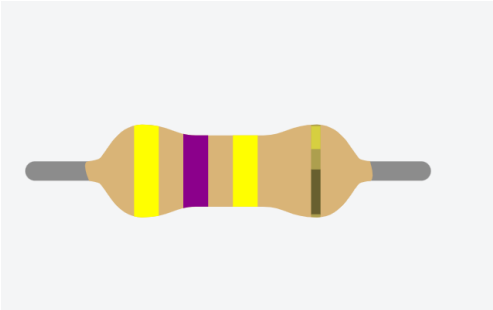

Figure 3: 470Ω resistance.

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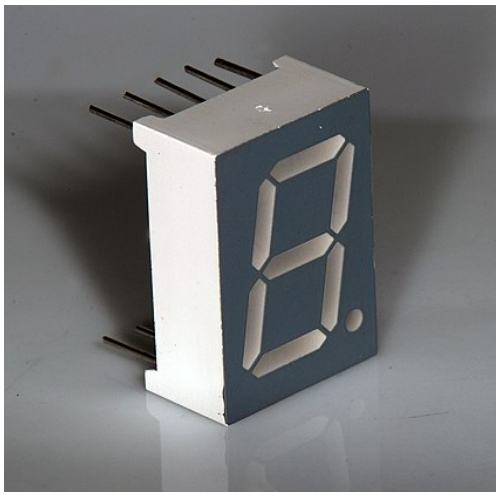

Figure 4: 7 Segment Display

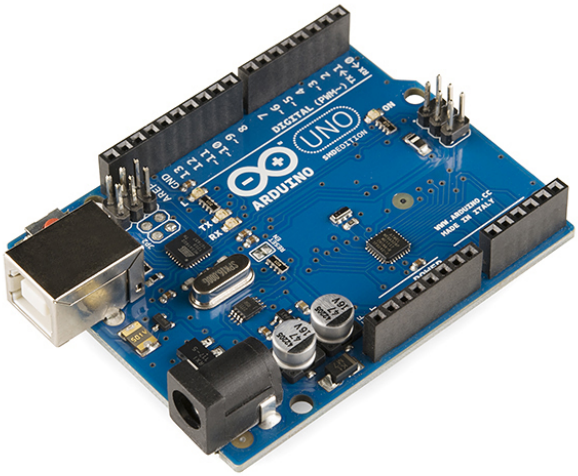

Figure 5: Arduino Uno.

0.1 Circuit diagram

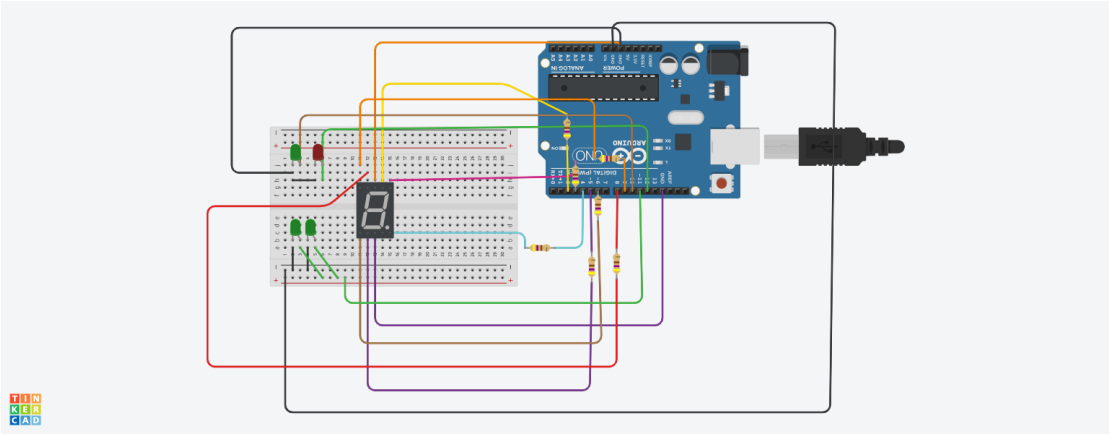

Figure 6: Circuit diagram.

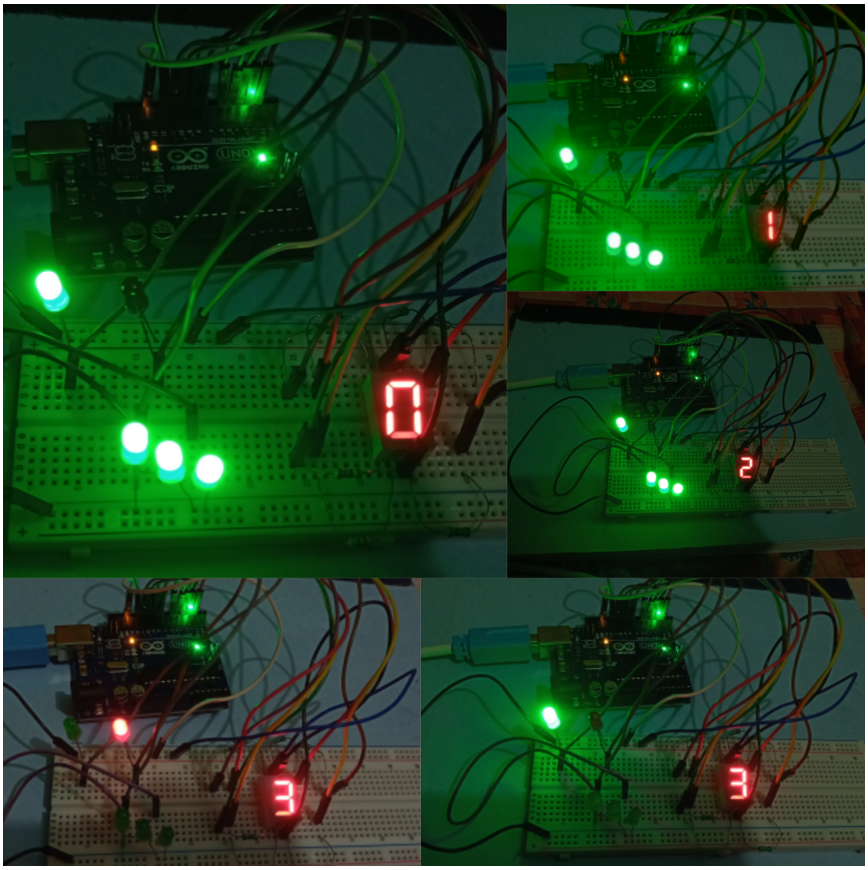

Figure 7: Hardware image.

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0.2 Arduino code(sketch)

```
int a=2;
int b=3;
int c=4;
int d=5;
int e=6;
int f=8;
int g=9;
int h=10;
int j=11;
int k=12;
int num=0;
int delaytime=10000;
void setup() {
  pinMode(a,OUTPUT);
  pinMode(b,OUTPUT);
  pinMode(c,OUTPUT);
  pinMode(d,OUTPUT);
  pinMode(e,OUTPUT);
  pinMode(f,OUTPUT);
  pinMode(g,OUTPUT);
  pinMode(h,OUTPUT);
  pinMode(j,OUTPUT);
  pinMode(k,OUTPUT);
  Serial.begin(9600);
}

void loop() {

  if(num==0)
  {
    digitalWrite(k,LOW);
    digitalWrite(h,HIGH);
    digitalWrite(j,HIGH);
    digitalWrite(a,HIGH);
    digitalWrite(b,HIGH);
    digitalWrite(c,HIGH);
    digitalWrite(d,HIGH);
    digitalWrite(e,HIGH);
    digitalWrite(f,HIGH);
    digitalWrite(g,LOW);
    delay(delaytime);
  }
  if(num==1)
  {
    digitalWrite(h,HIGH);
    digitalWrite(j,HIGH);
    digitalWrite(a,LOW);
    digitalWrite(b,HIGH);
    digitalWrite(c,HIGH);
    digitalWrite(d,LOW);
    digitalWrite(e,LOW);
```

```
1
2       digitalWrite(f,LOW);
3       digitalWrite(g,LOW);
4       delay(delaytime);
5     }
6     if(num==2)
7     {
8       digitalWrite(h,HIGH);
9       digitalWrite(j,HIGH);
10      digitalWrite(a,HIGH);
11      digitalWrite(b,HIGH);
12      digitalWrite(c,LOW);
13      digitalWrite(d,HIGH);
14      digitalWrite(e,HIGH);
15      digitalWrite(f,LOW);
16      digitalWrite(g,HIGH);
17      delay(delaytime);
18    }
19    if(num==3)
20    {
21
22      digitalWrite(j,LOW);
23      digitalWrite(a,HIGH);
24      digitalWrite(b,HIGH);
25      digitalWrite(c,HIGH);
26      digitalWrite(d,HIGH);
27      digitalWrite(e,LOW);
28      digitalWrite(f,LOW);
29      digitalWrite(g,HIGH);
30      delay(delaytime);
31       digitalWrite(h,LOW);
32      digitalWrite(k,HIGH);
33      delay(3000);
34    }
35
36
37    num=num+1;
38    if(num>4)
39    {
40      num=0;
41    }
42    delay(500);
43  }
```

.

1 Results and discussion

The following project demonstarates the amalgamation of computer programming and electrical circuit.Here in the arduino code we initialize the pins.At first 20 second both way willbe open and the next 10 second only main route will be open and other will be closed. And after 30 second Red signal will be shown for both.

Discussion::

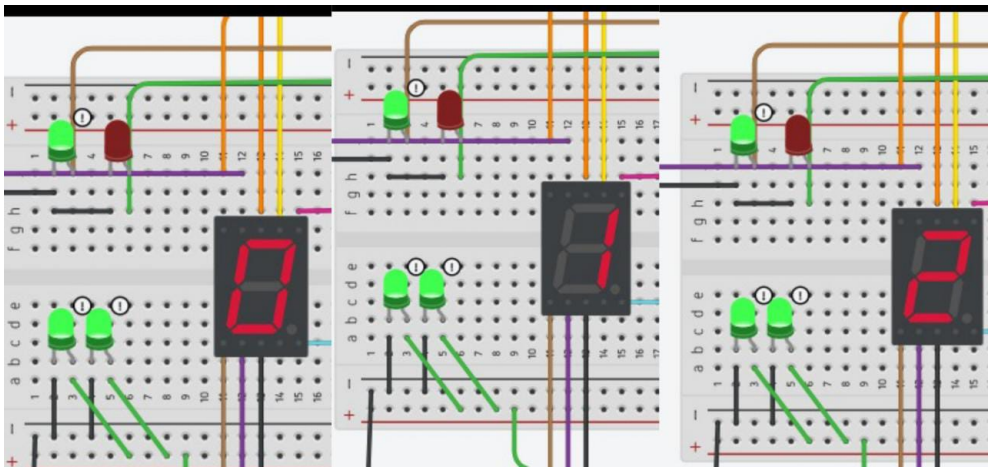

Figure 8: **When both ways are green signal.**

Here when 7 segment display show 0 to 1 it means 10 seconds.In first 20 seconds both the way is open and hence both shows green signal.

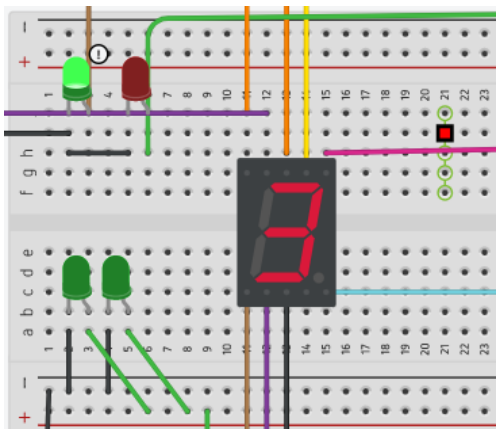

Figure 9: **When only one way is green signal and other is red.**

Here the main route has the green signal but for the last 10 seconds subway is in red signal.

2 Conclusion

2-way traffic navigation system was realized using 7-segment Display and arduino uno to control the traffic light.The project has helped to show how practcal signal can be demonstrated through programming and circuit analysis.
So, from the project we can also infer that how programming and basic circuits can be used as a teaching aid which helps us to conceptualize the abstract ideas of mathematics and physics

3 Acknowledgement

I would like to express my gratitude to Asutosh college, Calcutta University and Prof. Surja Sarathi Bhattacharjee for giving me the golden opportunity to do this interesting project on the topic of Arduino, I am grateful to the department as they allowed me to construct 2 WAY TRAFFIC NAVIGATION SYSYTEM which helped me to learn a lot about programming and controlling microprocessors in detail.
Secondly, I would like to thank one of my closest friend who helped and encouraged me in finishing the project within the limited amount of time .
Lastly, during this challenging time of pandemic textbooks and Youtube have been a constant source of knowledge and inspiration in learning new things. I feel privileged that I have unlimited access to internet which has helped me in exploring unknown territories which otherwise would not have been possible

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