Index

Overview

The main objective of this project is to design a simple but automated traffic controller and illustrate its operation by programming. A traffic light management system is necessary to control the traffic lights to open a road or close. Especially in front of the cross about road to manage the vehicles. It provides for public safety by ensuring opposing traffic doesn't enter an intersection at the same time, and crashes. It also ensures that pedestrians have ample time to cross the street. A well-coordinated and timed Traffic signal system will move more traffic down the road quicker than it would without a coordinated traffic signal system.

Equipment and Tools

1. Arduino UNO
2. LED (Red, Yellow, Green)
3. Seven-segment Display
4. Registers
5. Wires

LED Indicator

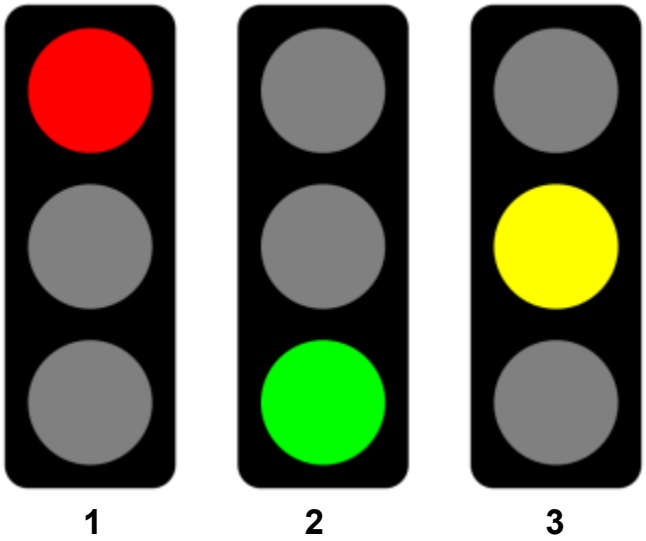
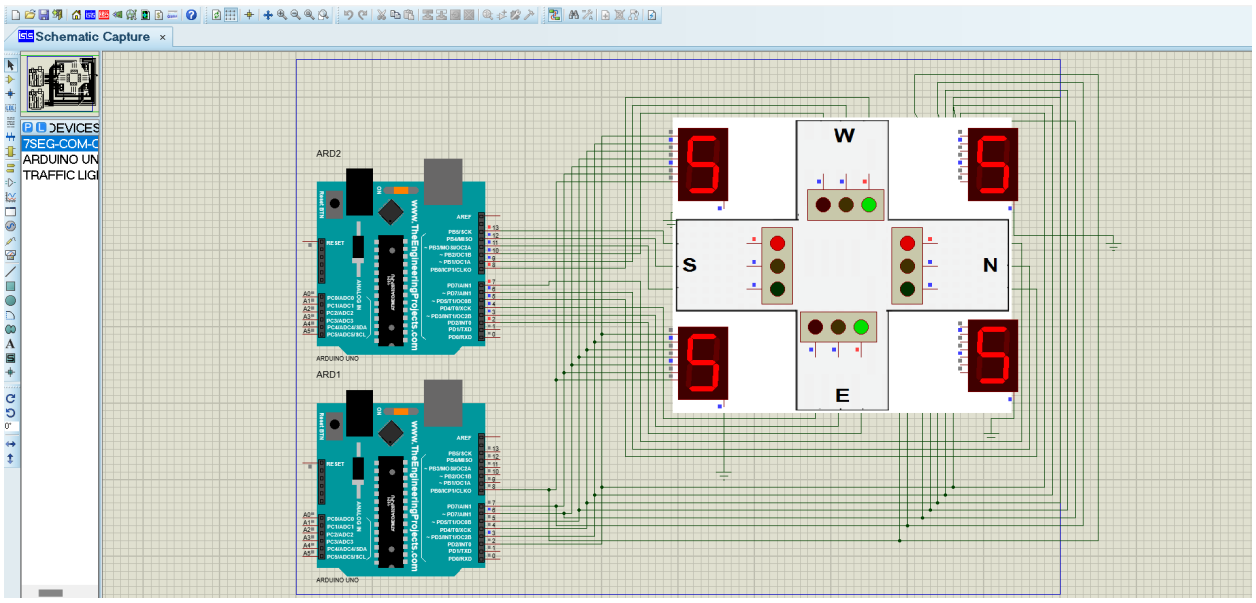


Figure: Coloured LED

There are three different pictures are showing above named 1, 2 and 3. The coloured circle are assumed as LED. So, there are 3 different coloured LEDs showing one of them is red which is named 1, green is named 2 and yellow is named 3. Each of the LEDs has meaning.

Picture 1: A red light means stop.
Picture 2: A green light means go.
Picture 3: A yellow light means slow down and be ready to stop to wait.

Design



Source Code

Traffic Light:

```
//East
int g1 = 2;
int y1 = 3;
int r1 = 4;

//North
int g2 = 5;
int y2 = 6;
int r2 = 7;

//West
int g3 = 8;
int y3 = 9;
int r3 = 10;
```

```
//South
int g4 = 11;
int y4 = 12;
int r4 = 13;

void setup()
{
  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);
}
void loop()
{
  digitalWrite(r1,LOW);
  digitalWrite(r3,LOW);
  digitalWrite(y1,LOW);
  digitalWrite(y2,LOW);
  digitalWrite(y3,LOW);
  digitalWrite(y4,LOW);
  digitalWrite(g2,LOW);
  digitalWrite(g4,LOW);
  digitalWrite(r2,HIGH);
  digitalWrite(r4,HIGH);
  digitalWrite(g1,HIGH);
  digitalWrite(g3,HIGH);
  delay(6000);
  digitalWrite(y1,HIGH);
  digitalWrite(y3,HIGH);
  delay(2000);
  digitalWrite(y1,LOW);
  digitalWrite(y3,LOW);
  digitalWrite(g1,LOW);
  digitalWrite(g3,LOW);
```

```
  digitalWrite(r1,HIGH);
  digitalWrite(r3,HIGH);
  digitalWrite(y2,HIGH);
  digitalWrite(y4,HIGH);
  delay(2000);
  digitalWrite(r2,LOW);
  digitalWrite(r4,LOW);
  digitalWrite(y2,LOW);
  digitalWrite(y4,LOW);
  digitalWrite(g2,HIGH);
  digitalWrite(g4,HIGH);
  delay(6000);
  digitalWrite(y2,HIGH);
  digitalWrite(y4,HIGH);
  delay(2000);
  digitalWrite(r2,HIGH);
  digitalWrite(r4,HIGH);
  digitalWrite(y2,LOW);
  digitalWrite(y4,LOW);
  digitalWrite(g2,LOW);
  digitalWrite(g4,LOW);
  digitalWrite(y1,HIGH);
  digitalWrite(y3,HIGH);
  delay(2000);
}
```

Seven Segment Display:

```
void setup() {
  pinMode(2, OUTPUT);
  pinMode(3, OUTPUT);
  pinMode(4, OUTPUT);
  pinMode(5, OUTPUT);
  pinMode(6, OUTPUT);
  pinMode(7, OUTPUT);
  pinMode(8, OUTPUT);
}
//Function
void loop() {
//Zero();
One();
Two();
```

```
Three();
Four();
Five();
Six();
Seven();
Eight();
Nine();
Zero();

}

void Zero() {
 digitalWrite(2, HIGH);
 digitalWrite(3, HIGH);
 digitalWrite(4, HIGH);
 digitalWrite(5, HIGH);
 digitalWrite(6, HIGH);
 digitalWrite(7, HIGH);
 digitalWrite(8, LOW);
 delay(1000);
}

void One(){
 digitalWrite(2, LOW);
 digitalWrite(3, HIGH);
 digitalWrite(4, HIGH);
 digitalWrite(5, LOW);
 digitalWrite(6, LOW);
 digitalWrite(7, LOW);
 digitalWrite(8, LOW);
 delay(1000);
}

void Two(){
 digitalWrite(2, HIGH);
 digitalWrite(3, HIGH);
 digitalWrite(4, LOW);
 digitalWrite(5, HIGH);
 digitalWrite(6, HIGH);
 digitalWrite(7, LOW);
 digitalWrite(8, HIGH);
 delay(1000);
}
```

```
void Three(){
 digitalWrite(2, HIGH);
 digitalWrite(3, HIGH);
 digitalWrite(4, HIGH);
 digitalWrite(5, HIGH);
 digitalWrite(6, LOW);
 digitalWrite(7, LOW);
 digitalWrite(8, HIGH);
 delay(1000);
}

void Four(){
 digitalWrite(2, LOW);
 digitalWrite(3, HIGH);
 digitalWrite(4, HIGH);
 digitalWrite(5, LOW);
 digitalWrite(6, LOW);
 digitalWrite(7, HIGH);
 digitalWrite(8, HIGH);
 delay(1000);
}

void Five(){
 digitalWrite(2, HIGH);
 digitalWrite(3, LOW);
 digitalWrite(4, HIGH);
 digitalWrite(5, HIGH);
 digitalWrite(6, LOW);
 digitalWrite(7, HIGH);
 digitalWrite(8, HIGH);
 delay(1000);
}

 void Six(){
 digitalWrite(2, HIGH);
 digitalWrite(3, LOW);
 digitalWrite(4, HIGH);
 digitalWrite(5, HIGH);
 digitalWrite(6, HIGH);
 digitalWrite(7, HIGH);
 digitalWrite(8, HIGH);
 delay(1000);
```

```
 }

void Seven(){
 digitalWrite(2, HIGH);
 digitalWrite(3, HIGH);
 digitalWrite(4, HIGH);
 digitalWrite(5, LOW);
 digitalWrite(6, LOW);
 digitalWrite(7, LOW);
 digitalWrite(8, LOW);
 delay(1000);
}

void Eight(){
 digitalWrite(2, HIGH);
 digitalWrite(3, HIGH);
 digitalWrite(4, HIGH);
 digitalWrite(5, HIGH);
 digitalWrite(6, HIGH);
 digitalWrite(7, HIGH);
 digitalWrite(8, HIGH);
 delay(1000);
}

 void Nine(){
 digitalWrite(2, HIGH);
 digitalWrite(3, HIGH);
 digitalWrite(4, HIGH);
 digitalWrite(5, HIGH);
 digitalWrite(6, LOW);
 digitalWrite(7, HIGH);
 digitalWrite(8, HIGH);
 delay(1000);
}
```

Uses in real life

Traffic lights are used to control the movement of vehicles and passengers to ensure smooth and safe traffic. Traffic lights have been around for years and are used to efficiently guide traffic at intersections and crossings. Traffic lights also save time by coordinating traffic routes and flow without traffic jams. It also helps to teach discipline to people in everyday life because the people who violate road rules and road safety signals have to pay fines to the authorities.

The primary function of any traffic signal is to assign right-of-way to conflict movements of traffic at an intersection. This is done by permitting conflicting streams of traffic to share the same intersection by means of time separation. By alternately assigning the right of way to various traffic movements, signals provide for the orderly movement of conflicting flows. They may interrupt extremely heavy flows to permit the crossing of minor movements that could not otherwise move safely through an intersection.

When properly timed, a traffic signal increases the traffic handling capacity of an intersection, and when installed under conditions that justify its use, a signal is a valuable device for improving the safety and efficiency of both pedestrian and vehicular traffic. In particular, signals may reduce certain types of accidents, most notably, right-angle (broadside) collisions.

While many people realize that traffic signals can reduce the number of right-angle collisions at an intersection, few realize that signals can also cause a significant increase in rear-end collisions. Normally, traffic engineers are willing to accept an increase in rear-end collisions for a decrease in the more severe right-angle accidents. However, when there is no right-angle accident problem at an intersection, and a signal is not needed for traffic control, the installation of traffic signals can actually cause deterioration in the overall safety at an intersection.