

Project 7 & 8

Traffic Light

&

Traffic Light with a Timer

Objective

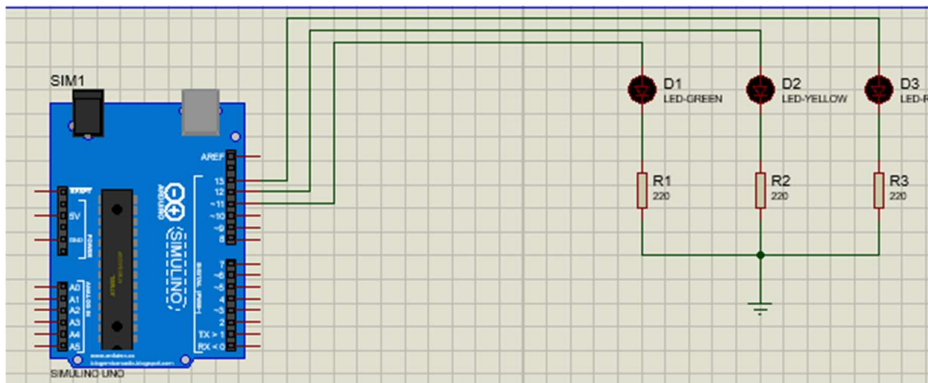
Making a traffic light using Arduino

Required Equipment's

Arduino Uno, 3 colored LED (red, yellow, green), 220ohm resistors, Breadboard, 7 jumper Cables.

Simulation of Traffic Light using Proteus

Open Proteus software and start a New Project, similarly to the first Project (**Blink LED**) add the Arduino, three colored LED (**LED-RED, LED-GREEN and LED-YELLOW**) and a three **220ohm** resistors from the **Object Selector** to the Editing **Window Area**. Connect them as shown below:



Arduino code

Open the Arduino IDE and from the menu bar select **file > open...**, then navigate to **"trafficlight_no_7seg"** folder and open the **"trafficlight_no_7seg.ino"** file.

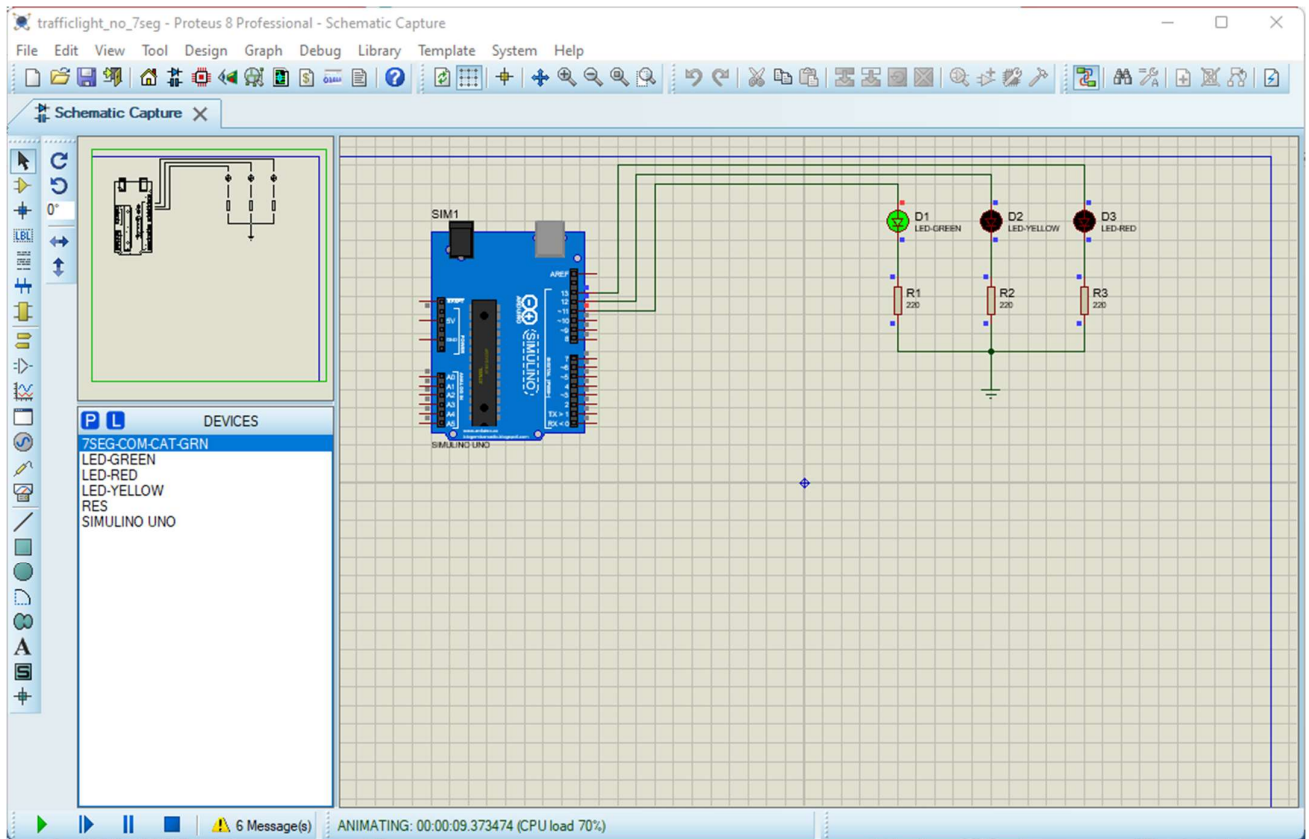
```
trafficlight_no_7seg | Arduino 1.8.16
File Edit Sketch Tools Help
trafficlight_no_7seg
// declare the vardiabales with the pin numbers.
int green=11;
int yellow=12;
int red=13;

void setup() {
// define pins 11,12,13 as output pins
pinMode(green, OUTPUT);
pinMode(yellow, OUTPUT);
pinMode(red, OUTPUT);
}

void loop() {
// turn on the red led for 8 seconds and turn of the others
digitalWrite(green,0);
digitalWrite(yellow,0);
digitalWrite(red,1);
delay(8000);
// turn on the yellow led for 1 second and turn of the others
digitalWrite(green,0);
digitalWrite(yellow,1);
digitalWrite(red,0);
delay(1000);
// turn on the green led for 8 seconds and turn of the others
digitalWrite(green,1);
digitalWrite(yellow,0);
digitalWrite(red,0);
delay(8000);
}

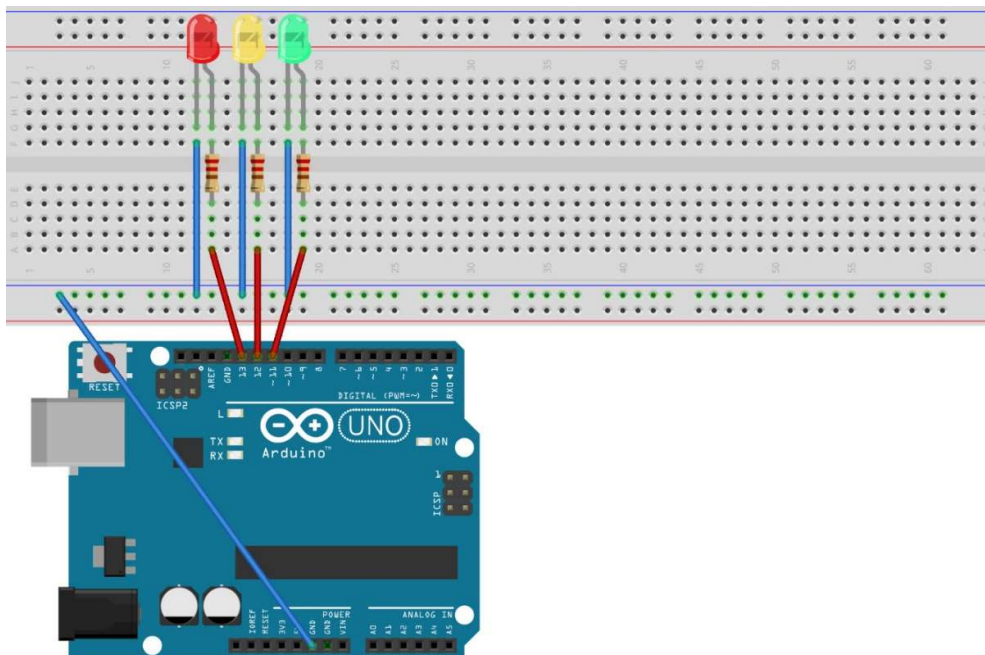
Done Saving
Error downloading https://downloads.arduino.cc/packages/package_index.json
16 Arduino Uno on COM5
```

After that compile the code and export the compiled binaries (*.HEX file) using **Sketch > Export Compiled Binary**, then from the Proteus double click on Arduino and from the Program File field insert the “**trafficlight_no_7seg.ino.hex**” then run the simulation process.



Implementation on Arduino

Attach the components as shown in the following picture:



fritzing

Compile the “**trafficlight_no_7seg.ino**” file then upload it to the Board to see the result.

PROJECT 8: Traffic Light with a Timer

Objective

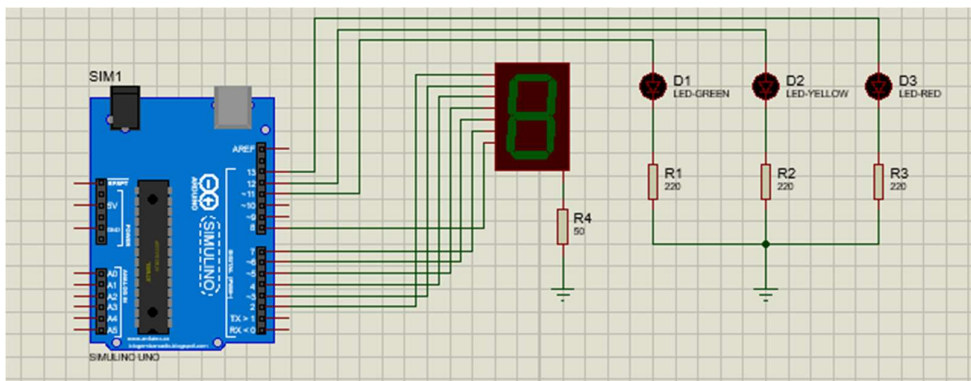
Making a traffic light with a Timer using Arduino and 7 Segment

Required Equipment's

Arduino Uno, 7 Segment, 3 colored LED (red, yellow, green), 220ohm resistors, Breadboard, 6 jumper Cables.

Simulation of Traffic Light using Proteus

Similar to previous Project open Proteus software and start a New Project, add the Arduino, three colored LED (**LED-RED, LED-GREEN and LED-YELLOW**), 7 Segment and a four **220ohm** resistors from the **Object Selector** to the Editing **Window Area**. Connect them as shown below:



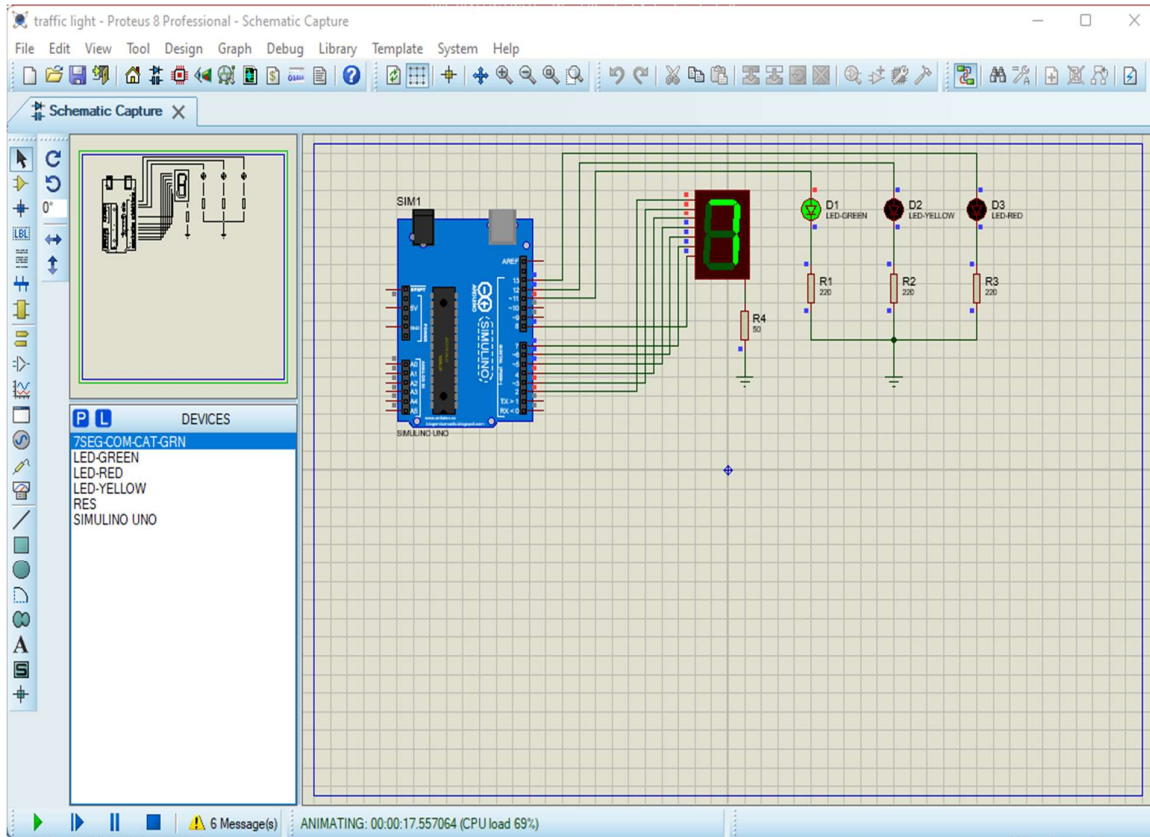
Arduino code

Open the Arduino IDE and from the menu bar select file > open..., then navigate to "trafficlight_with_7seg" folder and open the "trafficlight_with_7seg.ino" file.

```
trafficlight_with_7seg | Arduino 1.8.16
File Edit Sketch Tools Help
trafficlight_with_7seg $
// define pin variables
int led1=2;
int led2=3;
int led3=4;
int led4=5;
int led5=6;
int led6=7;
int led7=8;
int green=11;
int yellow=12;
int red=13;
void setup() {
  // set the pins as output pins
  pinMode(led1, OUTPUT);
  pinMode(led2, OUTPUT);
  pinMode(led3, OUTPUT);
  pinMode(led4, OUTPUT);
  pinMode(led5, OUTPUT);
  pinMode(led6, OUTPUT);
  pinMode(led7, OUTPUT);
  pinMode(green, OUTPUT);
  pinMode(yellow, OUTPUT);
  pinMode(red, OUTPUT);
}

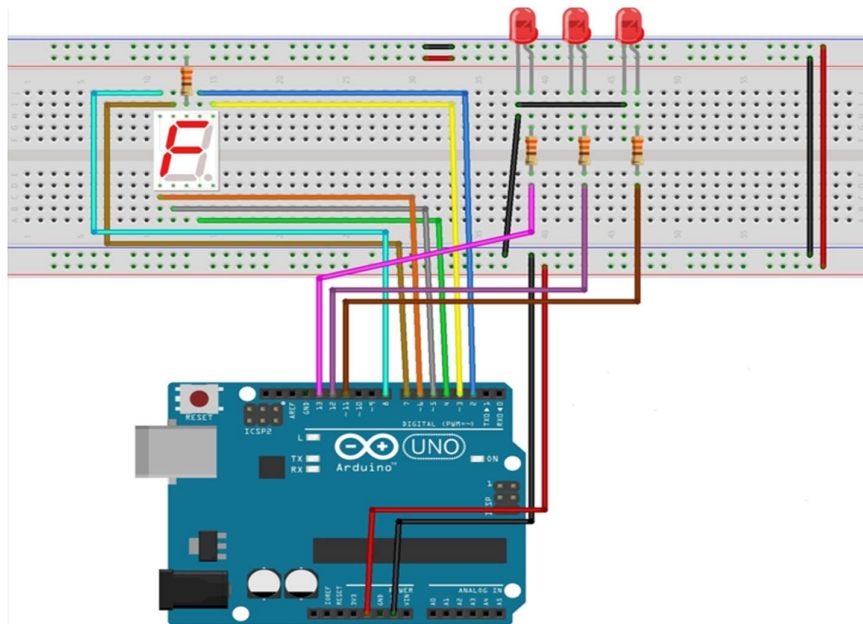
void loop() {
  // light up the red led for 8 seconds and start the 7 segment counter
  digitalWrite(led1,1);
}
```

After that compile the code and export the compiled binaries (*.HEX file) using **Sketch > Export Compiled Binary**, then from the Proteus double click on Arduino and from the Program File field insert the “**trafficlight_with_7seg.ino.hex**” the run the simulation process.



Implementation on Arduino

Attach the components as shown in the following picture:



fritzing

Compile the “**trafficlight_no_7seg.ino**” file then upload it to the Board to see the result.