



Learning Report – Formula 1 Reaction time game



L&T Technology Services



Document History

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APPLICATION OF FORMULA 1 REACTION TIME GAME

The average reaction time of any formula 1 driver is said to be very quick averaging to 0.2 seconds.

When the race start and the 5 lights go out each mili second delay in leaving clutch will result in losing race position in the initial laps and can be hard to recover if opponent have pace advantage in car.

By this Project you can check your reaction time with your favorite F1 driver and challenge your friends.

Application other than game

Not only as a game but also to test if the person is drunk or sober if the person is drunk his reaction time will be very high hence it can be used by police while patrolling highway

Rules:

In this game you have to press start button to start the game and when the lights go green from red you have to press start button. You will have total of 3 attempts

Game will calculate your reaction time of each attempt and will give you average of all those attempt and show you the final reaction time in ms.

COMPONENTS USED

1) Arduino:-



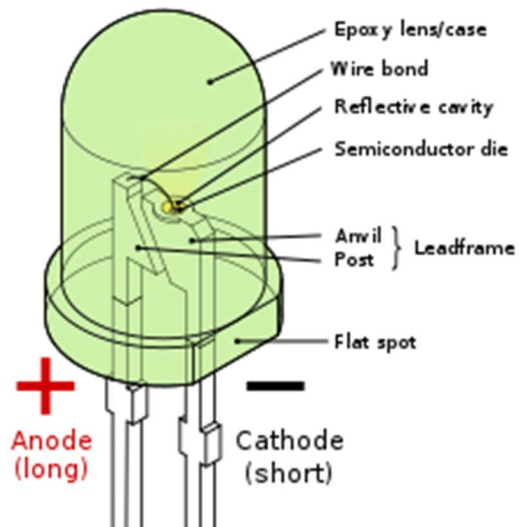
Arduino is an open-source hardware and software company, project and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices.

2) LCD:-

A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals combined with polarizers. Liquid crystals do not emit light directly,[1] instead using a backlight or reflector to produce images in color or monochrome

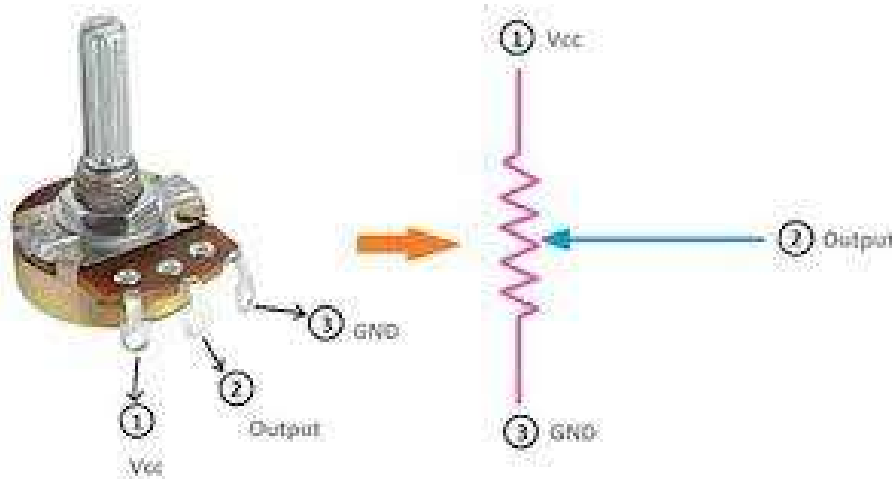


3) LED:-



A light-emitting diode is a semiconductor light source that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons.

4) Potentiometer:-



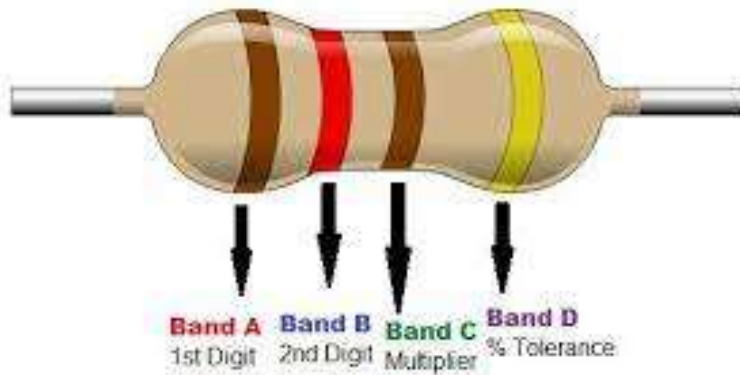
A potentiometer is a three-terminal resistor with a sliding or rotating contact that forms an adjustable voltage divider. If only two terminals are used, one end and the wiper, it acts as a variable resistor or rheostat.

5) Push button:-



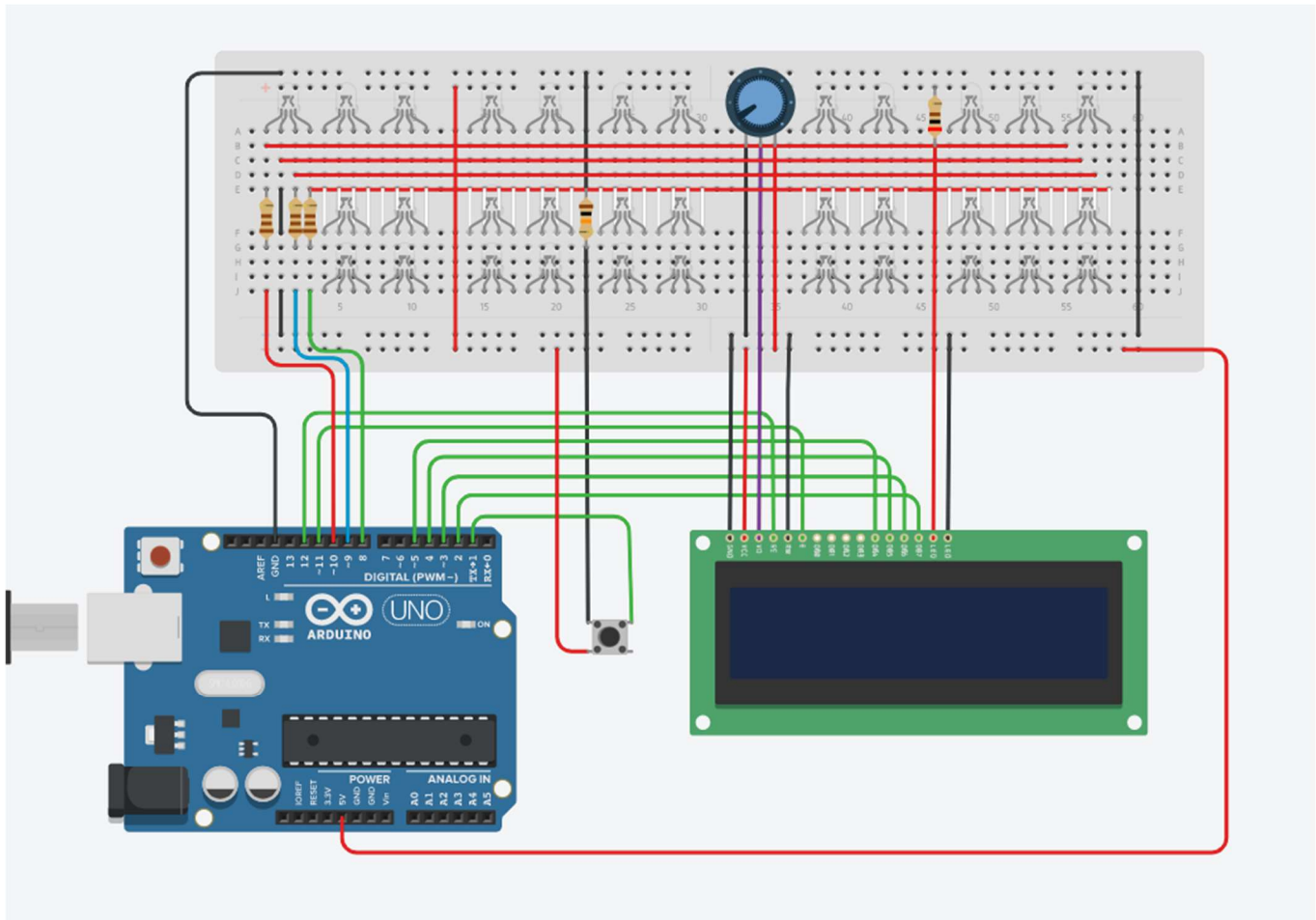
A push-button (also spelled pushbutton) or simply button is a simple switch mechanism to control some aspect of a machine or a process. Buttons are typically made out of hard material, usually plastic or metal.[1] The surface is usually flat or shaped to accommodate the human finger or hand, so as to be easily depressed or pushed.

6) Resistor:-

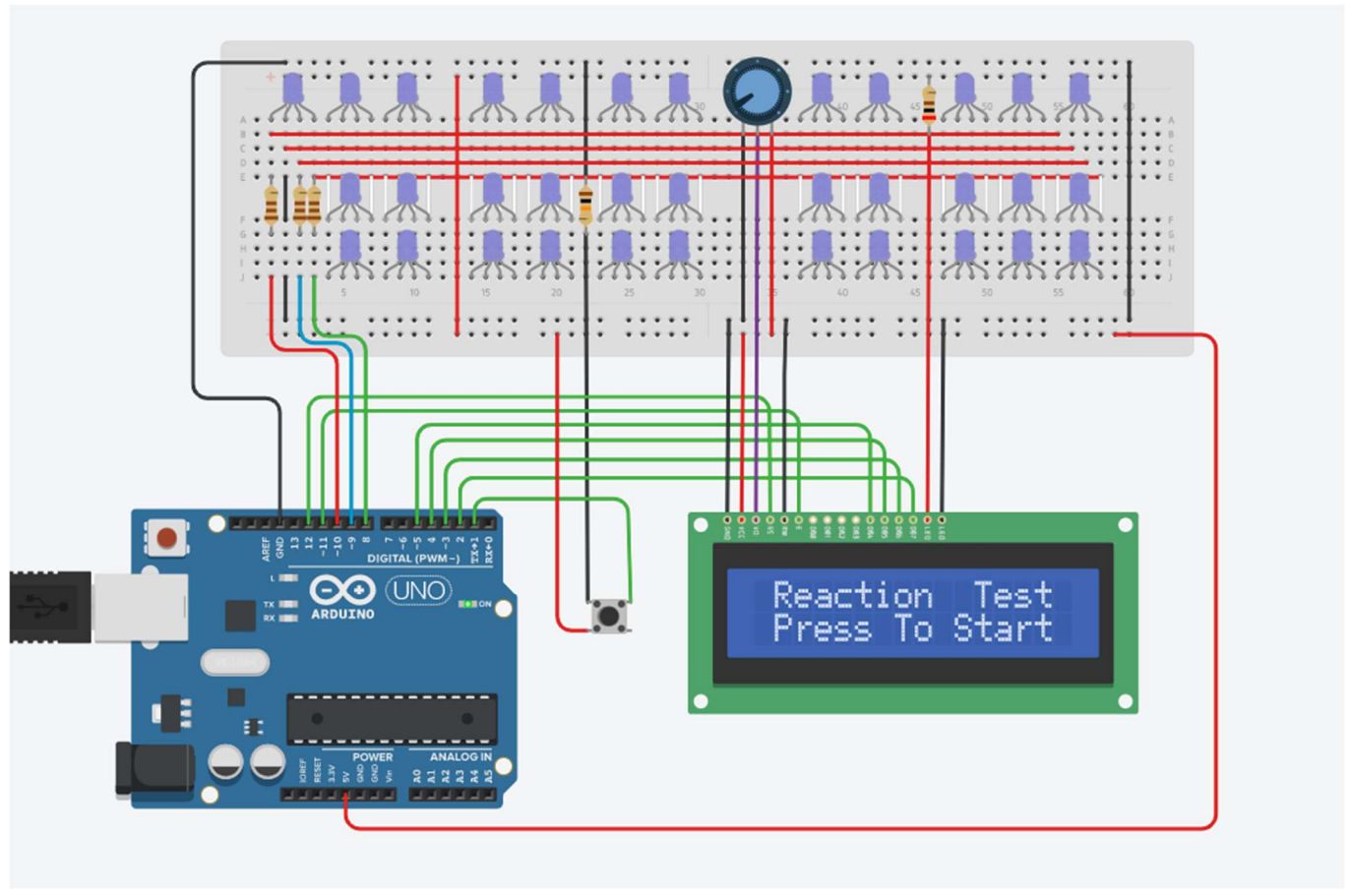


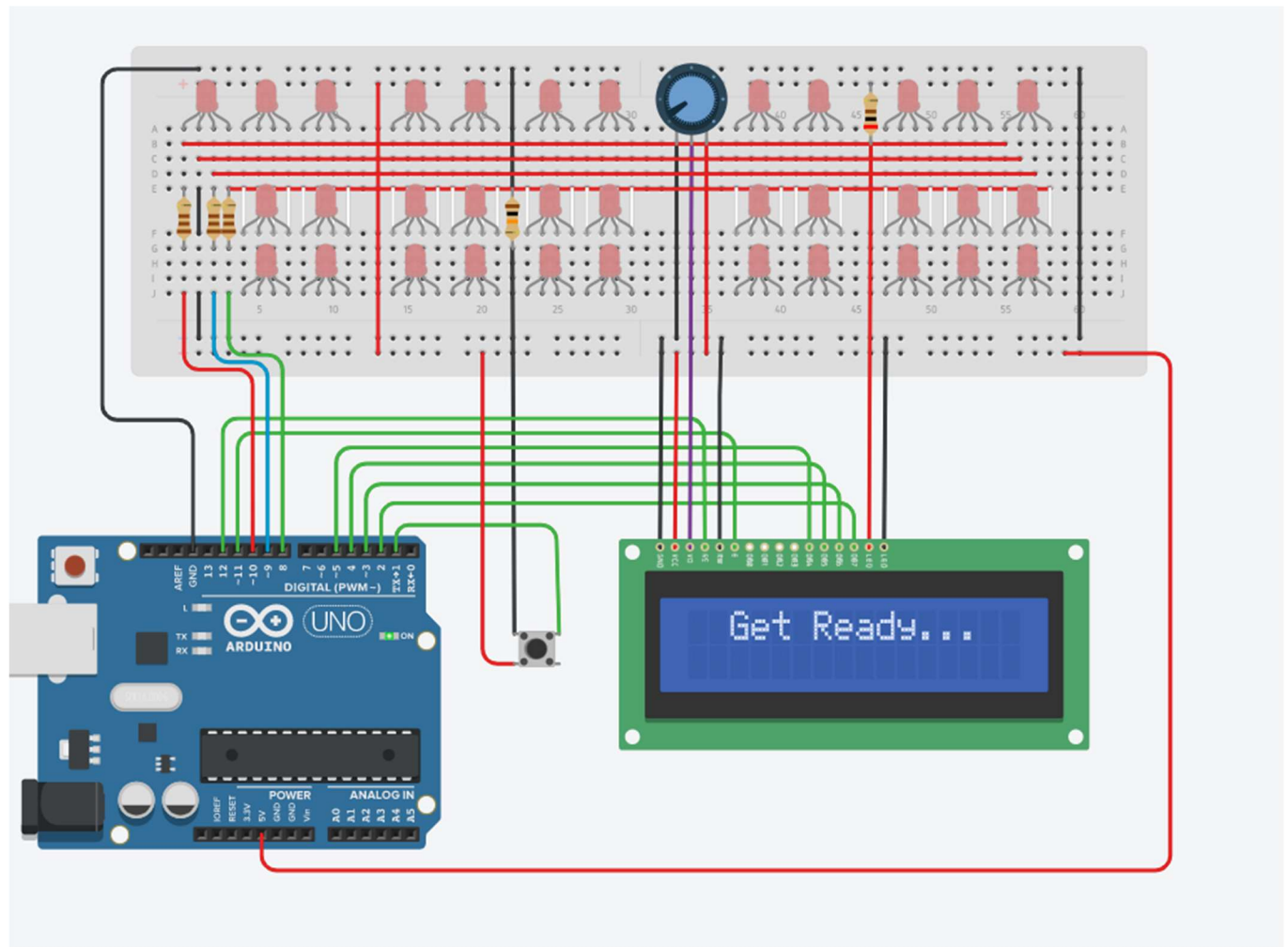
A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active

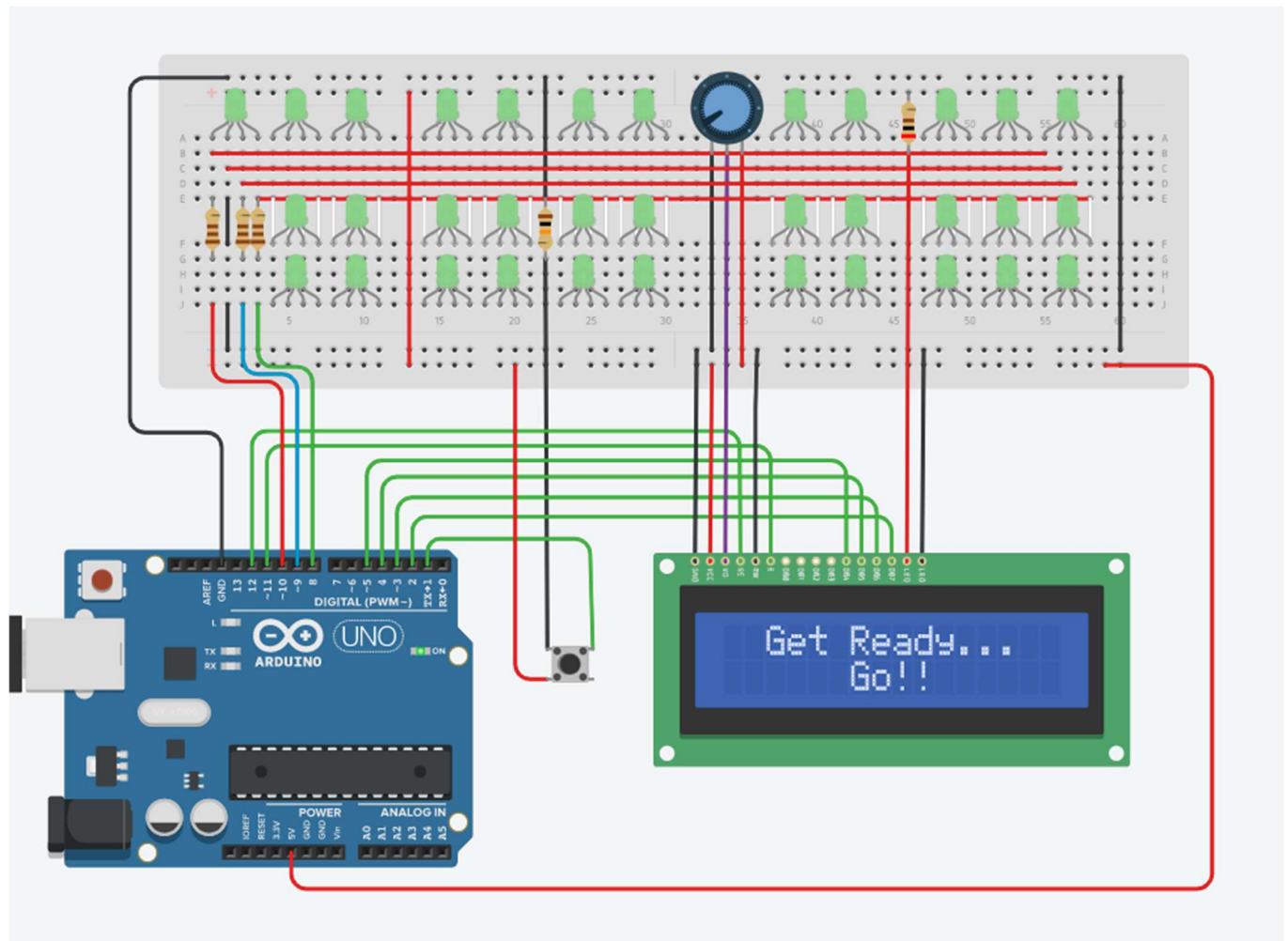
CIRCUIT CONNECTION:

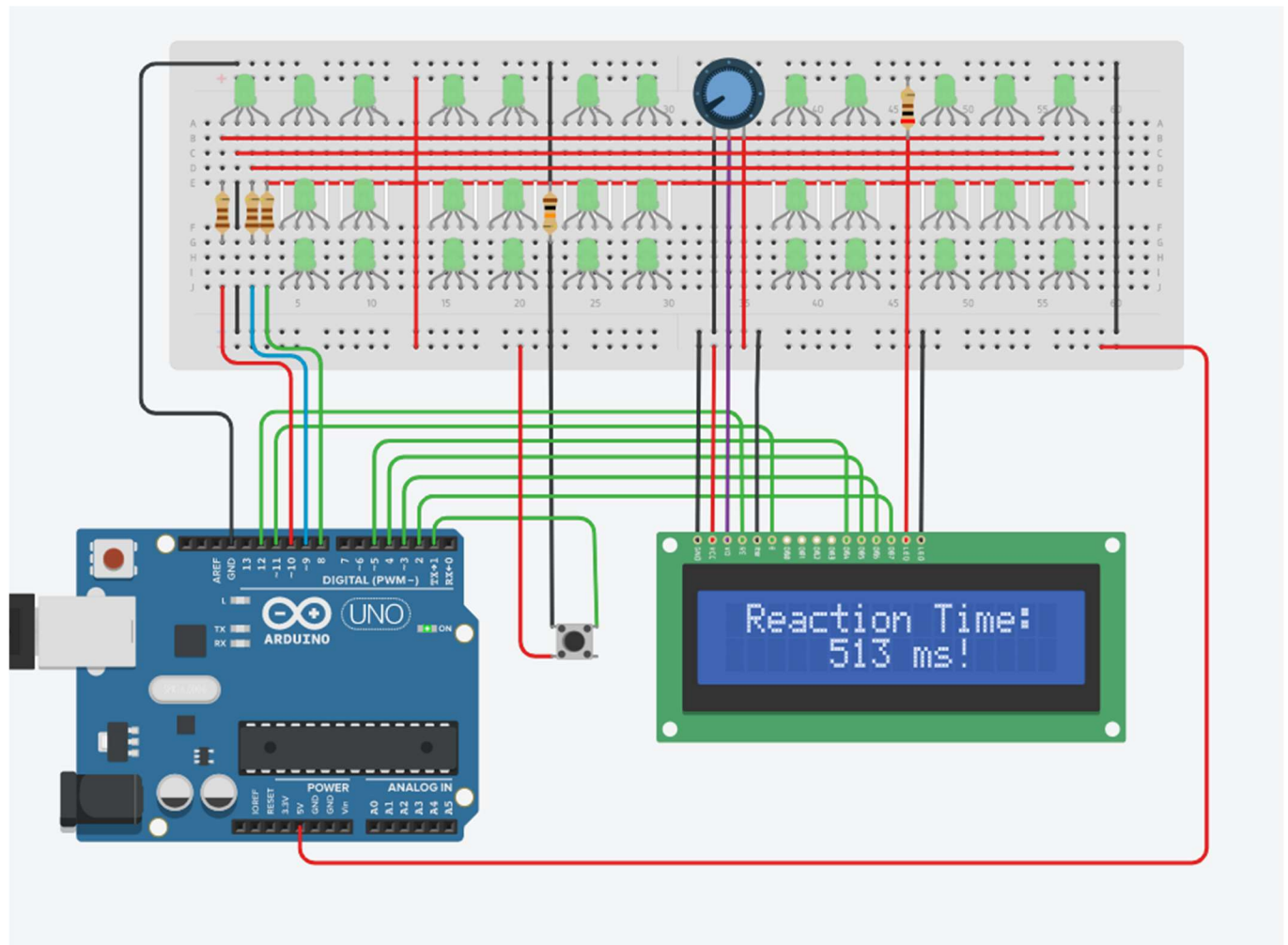


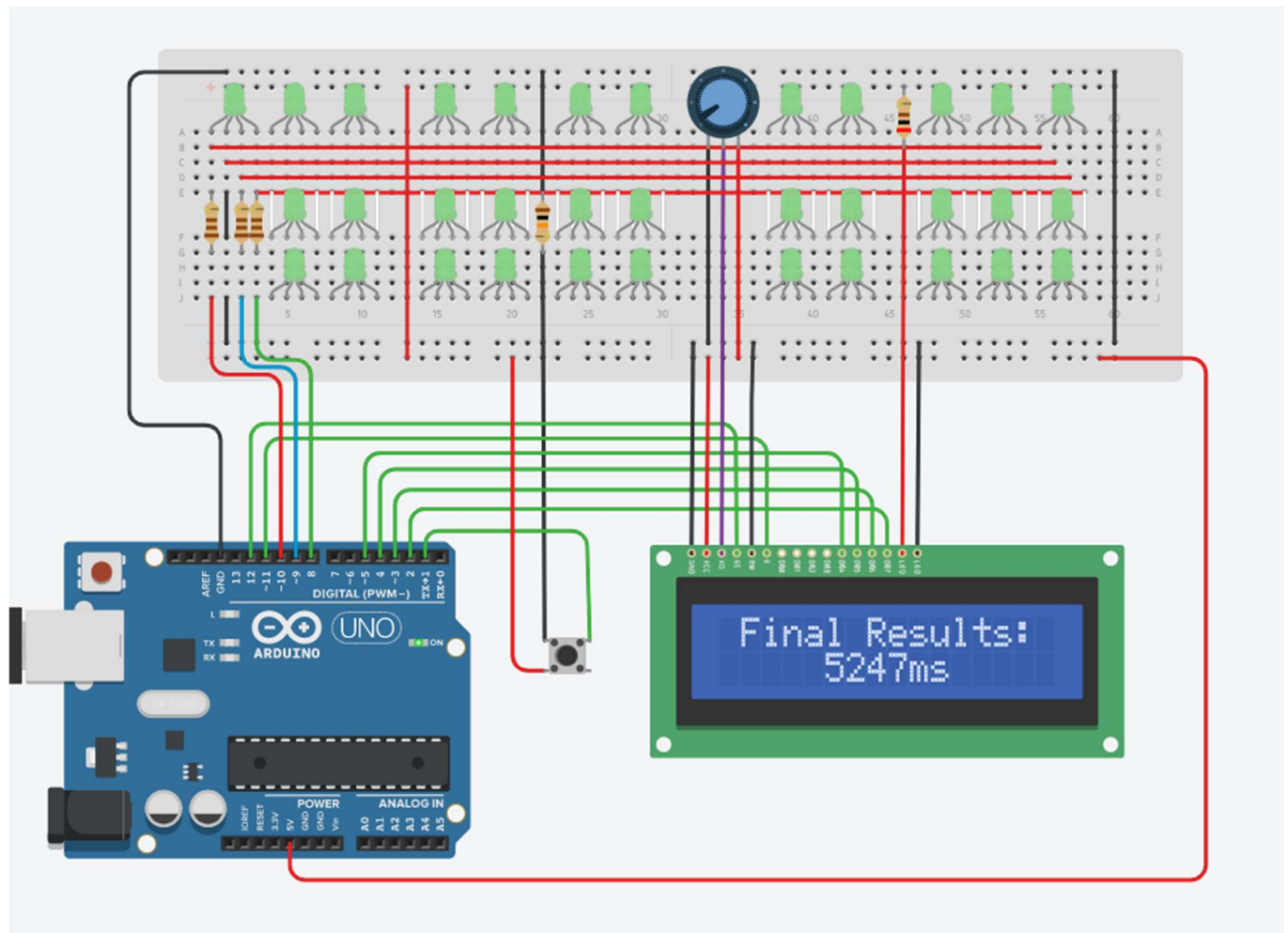
TINKER CAD SIMULATION & OUTPUT:











TINKER CAD CODE:

```
#INCLUDE <LIQUIDCRYSTAL.H>
LIQUIDCRYSTAL LCD(12, 11, 5, 4, 3, 2);
INT RED_PIN = 10;
INT BLUE_PIN = 9;
INT GREEN_PIN = 8;

INT BUTTONSTATE = 0;

INT FIRSTREACTIONTIME = 0;
INT SECONDDREACTIONTIME = 0;
INT THIRDDREACTIONTIME = 0;
INT AVERAGE = 0;

VOID SET_RGB_COLOR(INT RED_VALUE, INT GREEN_VALUE, INT BLUE_VALUE)
{
  ANALOGWRITE(RED_PIN, RED_VALUE);
  ANALOGWRITE(GREEN_PIN, GREEN_VALUE);
  ANALOGWRITE(BLUE_PIN, BLUE_VALUE);
}

VOID RANDOMWAIT()
{
  DELAY(RANDOM(2000, 10000));
}

VOID MENU()
{
  LCD.SETCURSOR(1, 0);
  LCD.PRINT("REACTION TEST");
  LCD.SETCURSOR(1, 1);
  LCD.PRINT("PRESS TO START");
}

VOID READY()
{
  LCD.CLEAR();
  LCD.SETCURSOR(2, 0);
```



```
LCD.PRINT("GET READY...");  
SET_RGB_COLOR(255, 0, 0);  
}
```

```
VOID FIRSTATTEMPT()  
{  
  LCD.SETCURSOR(6, 1);  
  LCD.PRINT("GO!!");  
  SET_RGB_COLOR(0, 255, 0);  
  BUTTONSTATE = DIGITALREAD(1);  
  WHILE (BUTTONSTATE == LOW)  
  {  
    FIRSTREACTIONTIME++;  
    DELAY(1);  
    BUTTONSTATE = DIGITALREAD(1);  
  }  
}
```

```
VOID SECONDATTEMPT()  
{  
  LCD.SETCURSOR(6, 1);  
  LCD.PRINT("GO!!");  
  SET_RGB_COLOR(0, 255, 0);  
  BUTTONSTATE = DIGITALREAD(1);  
  WHILE (BUTTONSTATE == LOW)  
  {  
    SECONDBREACTIONTIME++;  
    DELAY(1);  
    BUTTONSTATE = DIGITALREAD(1);  
  }  
}
```

```
VOID THIRDATTEMPT()  
{  
  LCD.SETCURSOR(6, 1);  
  LCD.PRINT("GO!!");  
  SET_RGB_COLOR(0, 255, 0);  
  BUTTONSTATE = DIGITALREAD(1);  
  WHILE (BUTTONSTATE == LOW)  
  {  
    THIRDBREACTIONTIME++;  
    DELAY(1);  
  }  
}
```

```
    BUTTONSTATE = DIGITALREAD(1);
  }
}

VOID FIRSTATTEMPTRESULTS()
{
  IF (BUTTONSTATE == HIGH)
  {
    LCD.CLEAR();
    LCD.SETCURSOR(1, 0);
    LCD.PRINT("REACTION TIME:");
    LCD.SETCURSOR(5, 1);
    LCD.PRINT(FIRSTREACTIONTIME);
    LCD.SETCURSOR(9, 1);
    LCD.PRINT("MS!");
  }
}

VOID SECONDATTEMPTRESULTS()
{
  IF (BUTTONSTATE == HIGH)
  {
    LCD.CLEAR();
    LCD.SETCURSOR(1, 0);
    LCD.PRINT("REACTION TIME:");
    LCD.SETCURSOR(5, 1);
    LCD.PRINT(SECONDREACTIONTIME);
    LCD.SETCURSOR(9, 1);
    LCD.PRINT("MS!");
  }
}

VOID THIRDATTEMPTRESULTS()
{
  IF (BUTTONSTATE == HIGH)
  {
    LCD.CLEAR();
    LCD.SETCURSOR(1, 0);
    LCD.PRINT("REACTION TIME:");
    LCD.SETCURSOR(5, 1);
    LCD.PRINT(THIRDREACTIONTIME);
    LCD.SETCURSOR(9, 1);
  }
}
```

```
LCD.PRINT("MS!");
}
}

VOID FINALAVERAGERESULT()
{
  LCD.CLEAR();
  LCD.SETCURSOR(1, 0);
  LCD.PRINT("FINAL RESULTS:");
  LCD.SETCURSOR(5, 1);
  AVERAGE = (FIRSTREACTIONTIME + SECONDDREACTIONTIME + THIRDDREACTIONTIME) / 3;
  LCD.PRINT(AVERAGE);
  LCD.SETCURSOR(9, 1);
  LCD.PRINT("MS");
}

VOID RESTART()
{
  LCD.CLEAR();
  LCD.SETCURSOR(4, 0);
  LCD.PRINT("PRESS TO");
  LCD.SETCURSOR(3, 1);
  LCD.PRINT("PLAY AGAIN");
}

VOID SETUP()
{
  LCD.BEGIN(16, 2);
  PINMODE(1, INPUT);
  PINMODE(RED_PIN, OUTPUT);
  PINMODE(GREEN_PIN, OUTPUT);
  PINMODE(BLUE_PIN, OUTPUT);
  MENU();
}

VOID LOOP()
{
  BUTTONSTATE = DIGITALREAD(1);
  IF (BUTTONSTATE == HIGH)
  {
    READY();
    RANDOMWAIT();
  }
}
```

```
FIRSTATTEMPT();
FIRSTATTEMPTRESULTS();
DELAY(1500);

READY();
RANDOMWAIT();
SECONDATTEMPT();
SECONDATTEMPTRESULTS();
DELAY(1500);

READY();
RANDOMWAIT();
THIRDATTEMPT();
THIRDATTEMPTRESULTS();
DELAY(1500);

FINALAVERAGERESULT();
DELAY(2500);
RESTART();
}
ELSE
{
    SET_RGB_COLOR(0, 0, 255);
}
}
```

CONCLUSIONS:

From this project we can test reaction time of a person. Not only as a game but also to test if the person is drunk or sober if the person is drunk his reaction time will be very high hence it can be used by police while patrolling highway. Personally I learnt many things like using breadboard about Arduino its architecture and different types of sensors.