EE 2305 – Introduction to C Programming
Hardware Project 01

Traffic Lights

Project Features: Digital Output.

Program an Arduino board to simulate the traffic lights at the intersection of two streets.

North/South   East/West

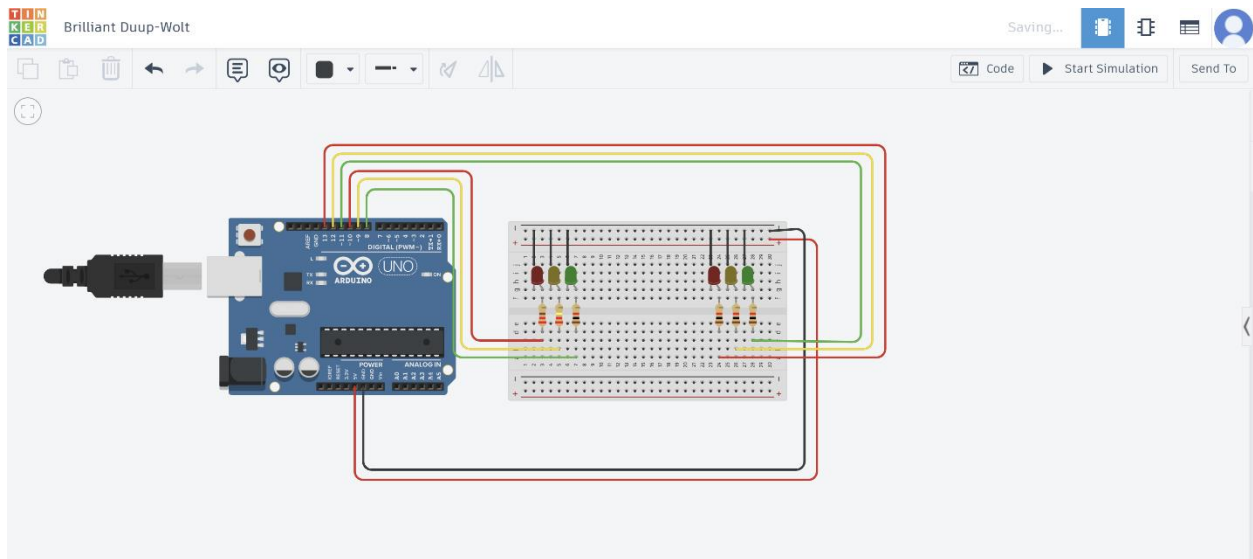R   Y   G   R   Y   G

Figure 1: Traffic Lights

To document your program, create a *Word* document and include all of the following sections in the document. Provide a brief description of the system and how you are designing it to operate,
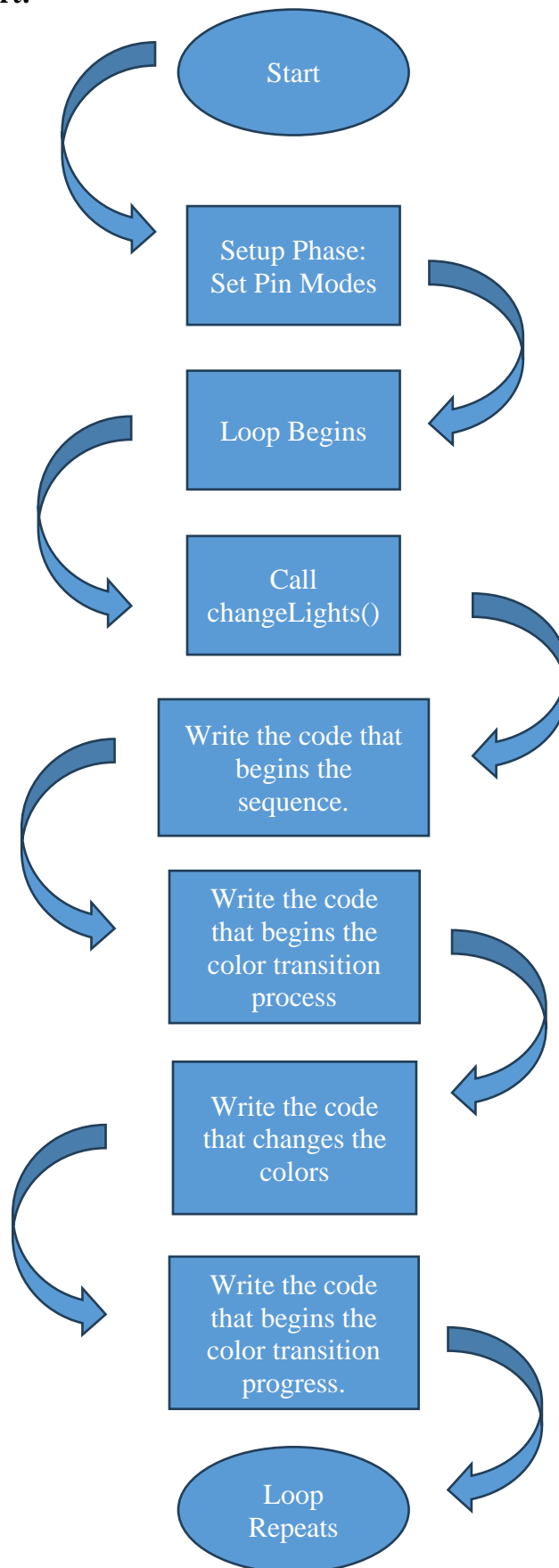
A. Hardware Diagram:
Provide a hardware diagram of the components.

Hardware Diagram

B. Program Flowchart:

Start

Setup Phase: Set Pin Modes

Loop Begins

Call changeLights()

Write the code that begins the sequence.

Write the code that begins the color transition process

Write the code that changes the colors

Write the code that begins the color transition progress.

Loop Repeats

C. Arduino Source Code

```
// Arduino Two Way Traffic Light by Average Education

// Traffic light one
int red1 = 10;
int yellow1 = 9;
int green1 = 8;

// Traffic light two
int red2 = 13;
int yellow2 = 12;
int green2 = 11;

void setup () {
// Traffic light one
pinMode (red1, OUTPUT);
pinMode (yellow1, OUTPUT);
pinMode (green1, OUTPUT);

// Traffic light two
pinMode (red2, OUTPUT);
pinMode (yellow2, OUTPUT);
pinMode (green2, OUTPUT);
}
void loop () {
changeLights ();
delay(10000);
}

void changeLights () {

// Starts the sequence
digitalWrite (green1, HIGH);
digitalWrite (green2, LOW);
digitalWrite (yellow1, LOW);
digitalWrite (yellow2, LOW);
digitalWrite (red1, LOW);
digitalWrite (red2, HIGH);
delay(5000);

// Light colors begin to switch sides
digitalWrite (green1, LOW);
digitalWrite (green2, LOW);
digitalWrite (yellow1, HIGH);
digitalWrite (yellow2, LOW);
```

```
digitalWrite (red1, LOW);
digitalWrite (red2, HIGH);
delay(3000);

// Light colors switch sides
digitalWrite (green1, LOW);
digitalWrite (green2, HIGH);
digitalWrite (yellow1, LOW);
digitalWrite (yellow2, LOW);
digitalWrite (red1, HIGH);
digitalWrite (red2, LOW);
delay(5000);

//Light colors begin to switch sides again
digitalWrite (green1, LOW);
digitalWrite (green2, LOW);
digitalWrite (yellow1, LOW);
digitalWrite (yellow2, HIGH);
digitalWrite (red1, HIGH);
digitalWrite (red2, LOW);
delay (3000);
}
```

D. Demonstration Video