,lp, aa EE 2305 – Introduction to C Programming
Hardware Project 01

Traffic Lights

Project Features: Digital Output.

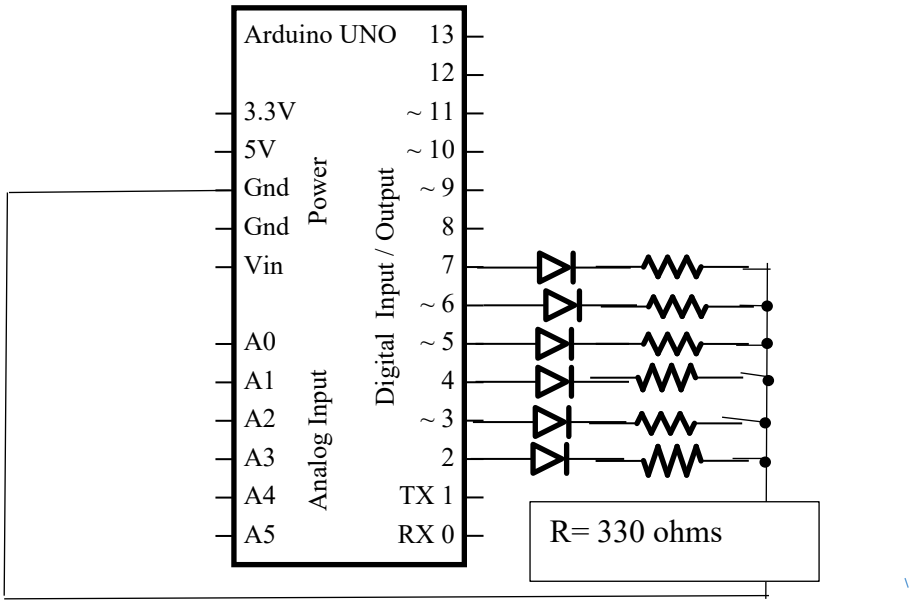
Program an Arduino board to simulate the traffic lights at the intersection of two streets.

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.

-

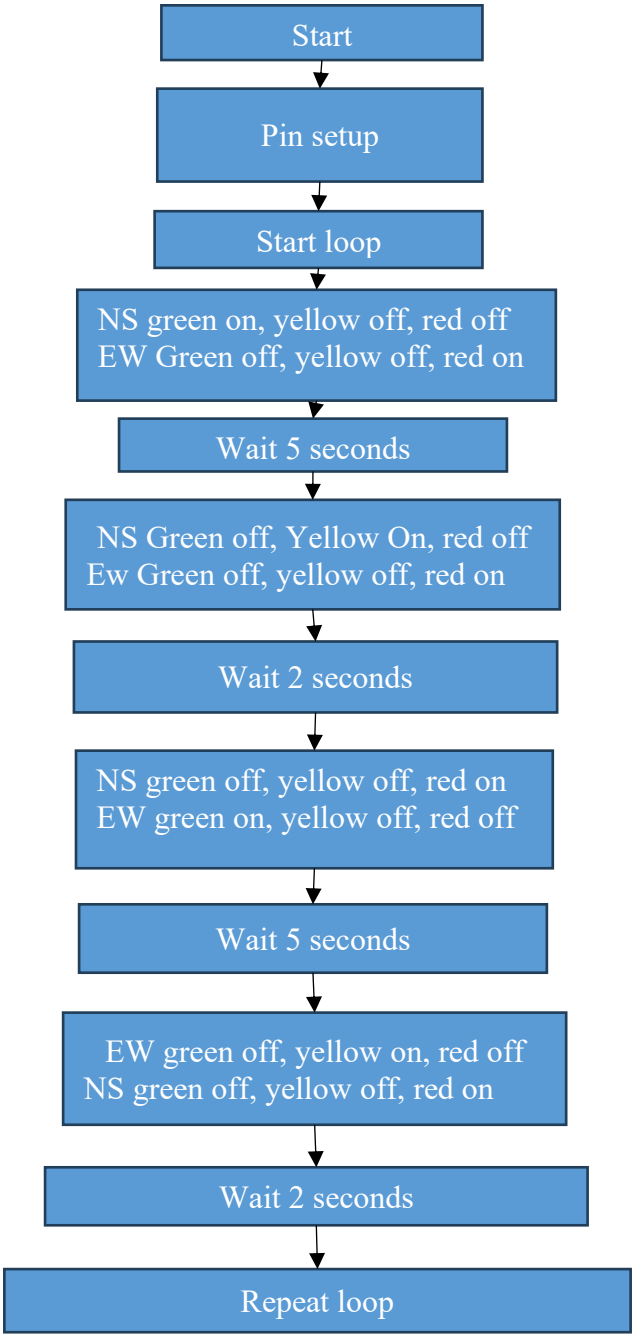


yg

Hardware Diagram

B. Program Flowchart:

Draw a flowchart of the program using the Word graphics shapes. Describe the timing of the traffic lights in the flowchart.


Start
Pin setup
Start loop
NS green on, yellow off, red off
EW Green off, yellow off, red on
Wait 5 seconds
NS Green off, Yellow On, red off
Ew Green off, yellow off, red on
Wait 2 seconds
NS green off, yellow off, red on
EW green on, yellow off, red off
Wait 5 seconds
EW green off, yellow on, red off
NS green off, yellow off, red on
Wait 2 seconds
Repeat loop

C. Arduino Source Code

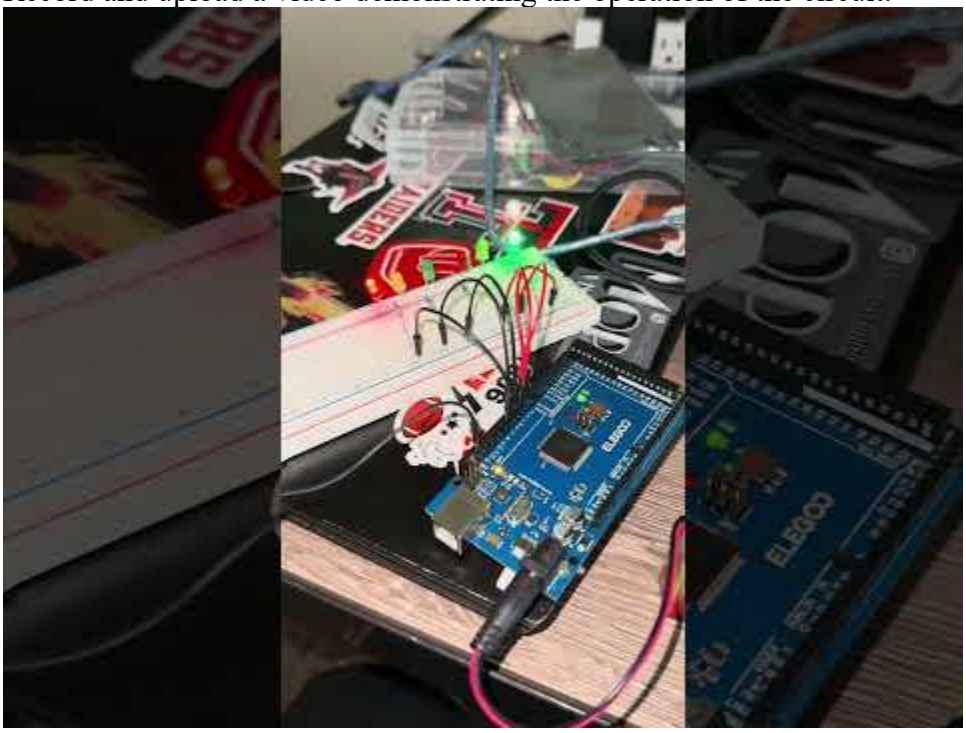
Insert the Arduino Source Code into the document.

```
// North-South
int NS_green = 2;
int NS_yellow = 3;
int NS_red = 4;

// East-West
int EW_green = 5;
int EW_yellow = 6;
int EW_red = 7;

void setup() {
  pinMode(NS_green, OUTPUT);
  pinMode(NS_yellow, OUTPUT);
  pinMode(NS_red, OUTPUT);

  pinMode(EW_green, OUTPUT);
  pinMode(EW_yellow, OUTPUT);
  pinMode(EW_red, OUTPUT);
}

void loop() {
  digitalWrite(NS_green, HIGH);
  digitalWrite(NS_yellow, LOW);
  digitalWrite(NS_red, LOW);

  digitalWrite(EW_green, LOW);
  digitalWrite(EW_yellow, LOW);
  digitalWrite(EW_red, HIGH);

  delay(5000);
  digitalWrite(NS_green, LOW);
  digitalWrite(NS_yellow, HIGH);
  digitalWrite(NS_red, LOW);

  delay(2000);

  digitalWrite(NS_green, LOW);
  digitalWrite(NS_yellow, LOW);
  digitalWrite(NS_red, HIGH);

  digitalWrite(EW_green, HIGH);
  digitalWrite(EW_yellow, LOW);
  digitalWrite(EW_red, LOW);
```

```
  delay(5000);

  digitalWrite(EW_green, LOW);
  digitalWrite(EW_yellow, HIGH);
  digitalWrite(EW_red, LOW);

  delay(2000);

}
```

D. Demonstration Video

Record and upload a video demonstrating the operation of the circuit.



Save the document as a *PDF* file and submit the *PDF* document to *Blackboard*.