Experiment No 7 Pre-Lab

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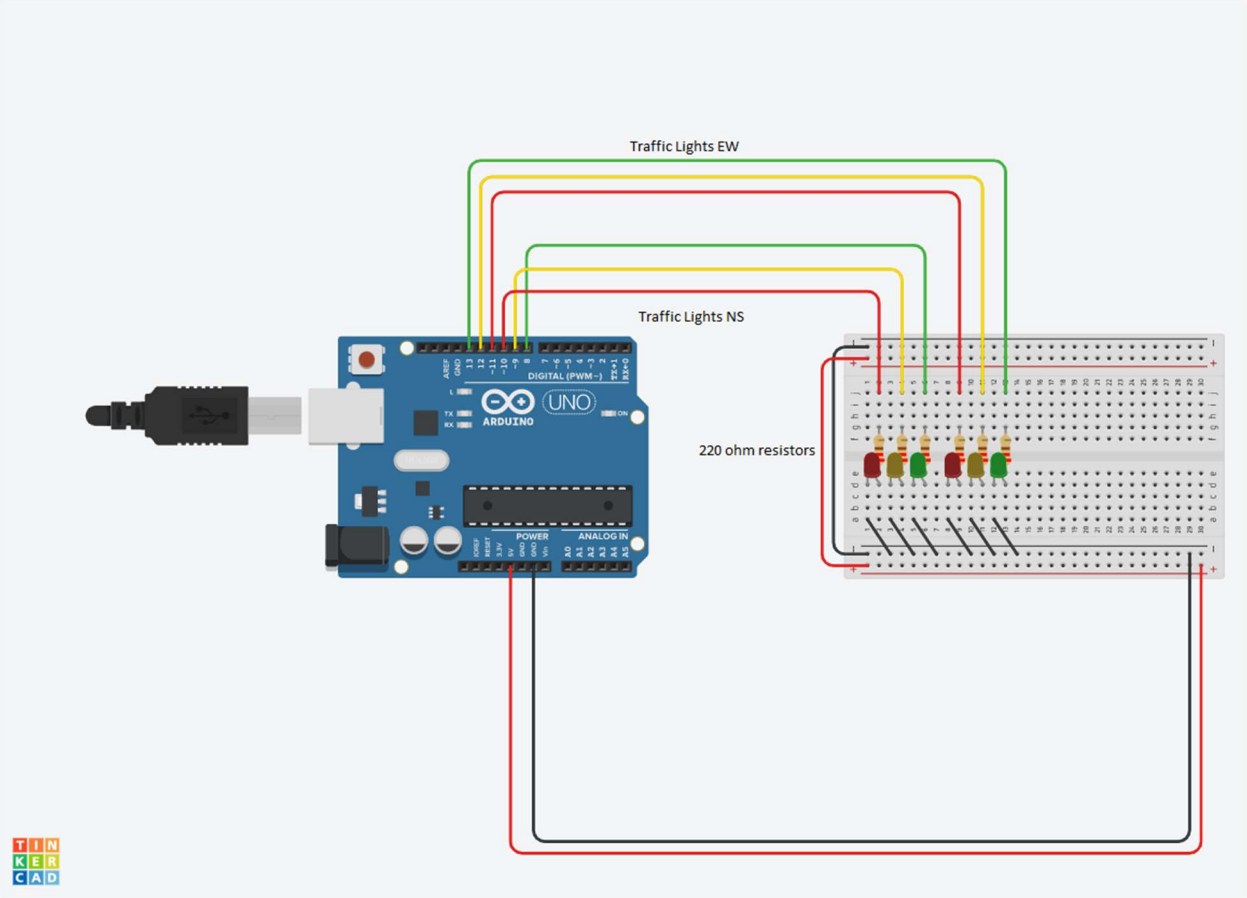
Preliminary Assignment

1.



Code:

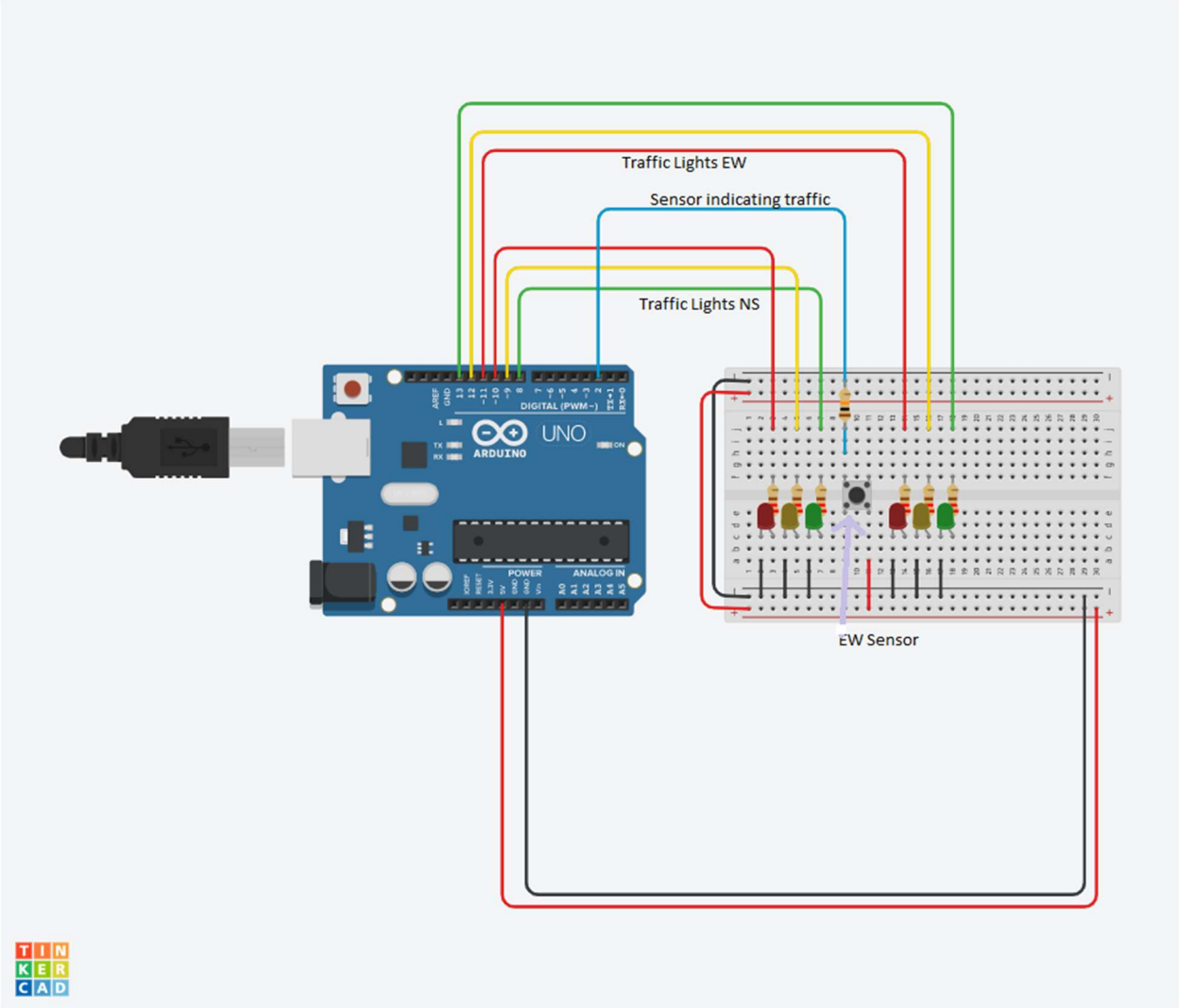
```
//Declare the pins
int GreenNS = 8;
int YellowNS = 9;
int RedNS = 10;
```

```
int GreenEW = 13;
int YellowEW = 12;
int RedEW = 11;
//Set pins as output
void setup()
{
        pinMode(GreenNS, OUTPUT);
        pinMode(YellowNS, OUTPUT);
        pinMode(RedNS, OUTPUT);
        pinMode(GreenEW, OUTPUT);
        pinMode(YellowEW, OUTPUT);
        pinMode(RedEW, OUTPUT);
}
//For the transition of lights turning on and transition
void loop()
{
    // Green-NS ON, Red-EW ON
   digitalWrite(GreenEW, LOW);
   digitalWrite(GreenNS, HIGH);
   digitalWrite(YellowEW, LOW);
   digitalWrite(YellowNS, LOW);
   digitalWrite(RedEW, HIGH);
   digitalWrite(RedNS, LOW);
   delay(10000);
  // Yellow-NS ON, Red-EW ON
   digitalWrite(GreenEW, LOW);
   digitalWrite(GreenNS, LOW);
   digitalWrite(YellowEW, LOW);
```

```
 digitalWrite(YellowNS, HIGH);
 digitalWrite(RedEW, HIGH);
 digitalWrite(RedNS, LOW);
 delay(1000);
// Red-NS ON, Red-EW ON
 digitalWrite(GreenEW, LOW);
 digitalWrite(GreenNS, LOW);
 digitalWrite(YellowEW, LOW);
 digitalWrite(YellowNS, LOW);
 digitalWrite(RedEW, HIGH);
 digitalWrite(RedNS, HIGH);
 delay(1000);
// Green-EW ON, Red-NS ON
 digitalWrite(GreenEW, HIGH);
 digitalWrite(GreenNS, LOW);
 digitalWrite(YellowEW, LOW);
 digitalWrite(YellowNS, LOW);
 digitalWrite(RedEW, LOW);
 digitalWrite(RedNS, HIGH);
 delay(5000);
// Yellow-EW ON, Red-NS ON
 digitalWrite(GreenEW, LOW);
 digitalWrite(GreenNS, LOW);
 digitalWrite(YellowEW, HIGH);
 digitalWrite(YellowNS, LOW);
 digitalWrite(RedEW, LOW);
 digitalWrite(RedNS, HIGH);
 delay(1000);
```

```
  // Red-NS ON, Red-EW ON
   digitalWrite(GreenEW, LOW);
   digitalWrite(GreenNS, LOW);
   digitalWrite(YellowEW, LOW);
   digitalWrite(YellowNS, LOW);
   digitalWrite(RedEW, HIGH);
   digitalWrite(RedNS, HIGH);
   delay(1000);
}
```

2.



Code:

```
// Variable used to store the state of the Walk Push Button
int WalkRequest = 0;
const int SensorNS = 2;
//  Declare pins
int GreenNS = 8;
int YellowNS = 9;
int RedNS = 10;
int GreenEW = 13;
int YellowEW = 12;
int RedEW = 11;
// variables that will change:
volatile int buttonState = 0;
//Set pins as output and input
void setup() {
     pinMode(GreenNS, OUTPUT);
   pinMode(YellowNS, OUTPUT);
     pinMode(RedNS, OUTPUT);
     pinMode(GreenEW, OUTPUT);
     pinMode(YellowEW, OUTPUT);
   pinMode(RedEW, OUTPUT);
     pinMode(SensorNS , INPUT);  //  Sets Push Button as INPUT
     attachInterrupt(0, pin_ISR, CHANGE);  //  "Watches" in the background for a button
press
// Set Initial state of all red LED to HIGH
     digitalWrite (RedNS, HIGH);
     digitalWrite (RedEW, HIGH);
}
void loop() {
```

```
  delay(1000);  //  1 Seconds of RedNS
  digitalWrite(RedNS, LOW);  //  Sets RedNS OFF GreenNS ON
  digitalWrite(GreenNS, HIGH);
  delay(10000);  // 10 Seconds of GreenNS
  digitalWrite(GreenNS, LOW);  //  Sets GreenNS OFF YellowNS ON
  digitalWrite(YellowNS, HIGH);
  delay(1000);  // 1 Seconds of YellowNS
  digitalWrite(YellowNS, LOW);  //  Sets YellowNS OFF RedNS ON
  digitalWrite(RedNS, HIGH);
  if (WalkRequest == 1)
  {
    //  If the button has been pressed
    WalkCycle();  //  Exit main loop and run WalkCycle () function
  }
}
void WalkCycle() {
  delay(1000);  //  1 Seconds of RedEW
  digitalWrite(RedEW, LOW); //  Sets RedEW OFF GreenEW ON
  digitalWrite(GreenEW, HIGH);
  delay(5000);  // 5 Seconds of GreenEW
  digitalWrite(GreenEW, LOW); //  Sets GreenEW OFF YellowEW ON
  digitalWrite(YellowEW, HIGH);
  delay(1000);  // 1 Seconds of YellowEW
  digitalWrite(YellowEW, LOW);  //  Sets YellowEW OFF RedEW ON
  digitalWrite(RedEW, HIGH);
  WalkRequest = 0; //  Reset Push Button
  asm volatile ("  jmp 0");  // Soft-reset of sketch. Makes sure Station 1 "MAIN" always gets
Green after a walk cycle
}
```

```
void pin_ISR() {
  (WalkRequest = 1);  //  Walk button has been pressed
 }
```