EXPERIMENT 9: ARDUINO 1

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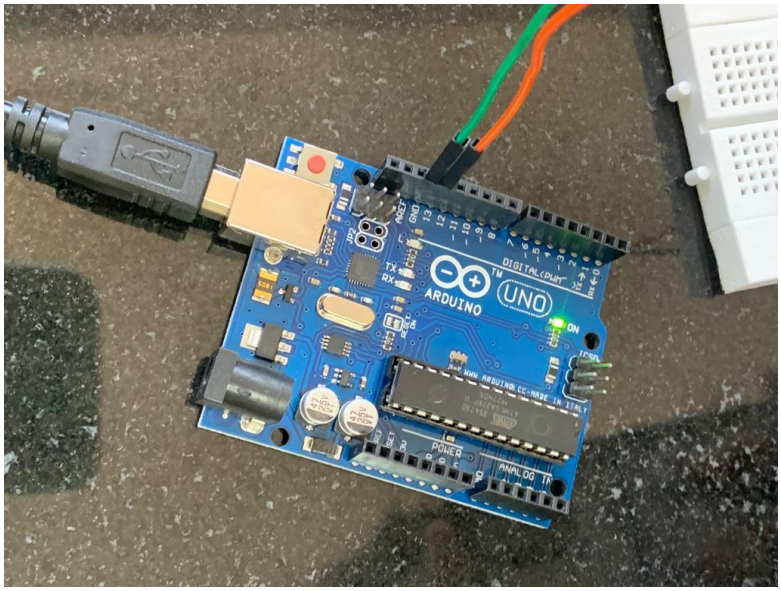
Task 1

To blink an onboard LED

Circuit:



Code:

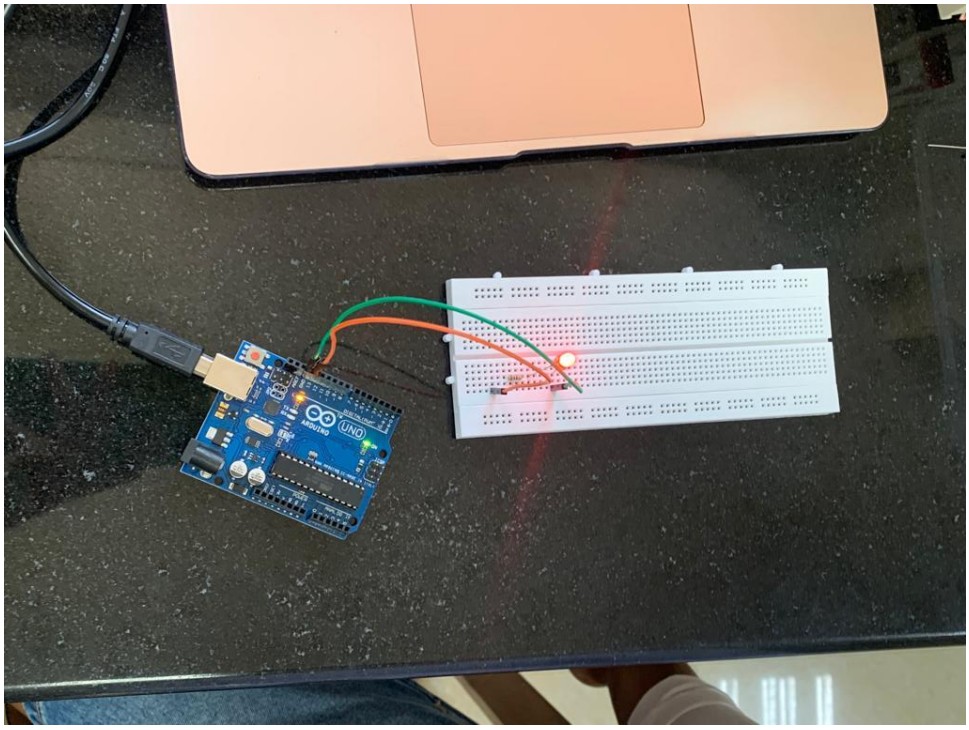
```
void setup()
{
        // initialize digital pin LED_BUILTIN as an output.
      pinMode(LED_BUILTIN, OUTPUT)
}
void loop()
{
      digitalWrite(LED_BUILTIN, HIGH);      //turn LED on
      delay(1000);                          //wait for a second
      digitalWrite(LED_BUILTIN, LOW);       //turn LED off
      delay(1000);                          //wait for a second
 }
```

Delay is measured in milliseconds. The above code is for 1 sec. delay.
Similarly, delay was calculated for 0.1s, 0.5s, 5s, 10s by converting it to milliseconds and inputting the value in the delay function.

Task 2

To blink an external LED

Circuit:



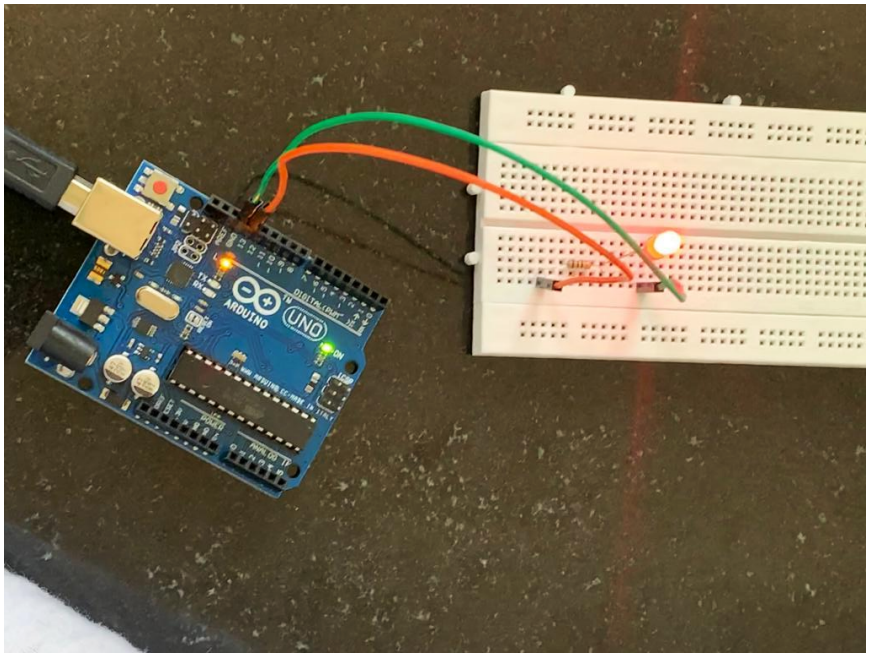
Code:

```
void setup()
{
        pinMode(13, OUTPUT);
        Serial.begin(9600);
}
void loop()
{
        digitalWrite(13, HIGH);
        delay(1000);
        digitalWrite(13, LOW);
        delay(1000);
 }
```

Task 3

Blink LED without time delay

Circuit:



Code:

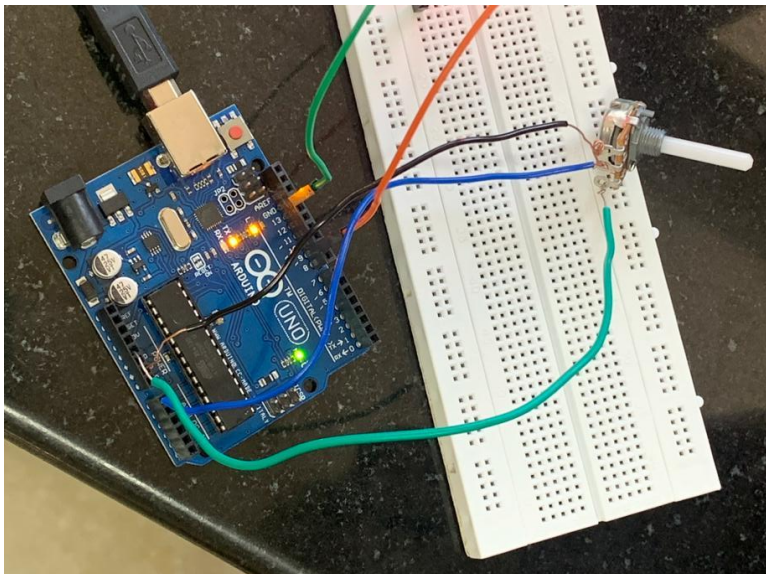
```
const int ledPin = LED_BUILTIN;                 //constant, number of LED pin
int ledState = LOW;                             //variable, ledState used to set the LED

unsigned long prieviousMillis = 0;                  // will store last time LED was updated
const long interval = 1000;                         //interval at which to blink (milliseconds)

void setup() {
        pinMode(ledPin, OUTPUT);
}

void loop() {

  //check to see if it's time to blink the LED; that is, if the difference
  //between the current time and last time you blinked the LED is bigger than
  //the interval at which you want to blink the LED.

        unsigned long currentMillis = millis();

        if (currentMillis - previousMillis >= interval) {
                //saving the last time the LED blinked
```

```
                previousMillis = currentMillis;

                if (ledState ==LOW) {
                        ledState == HIGH;
                } else {
                        ledState = LOW;
                }

                digitalWrite(ledPin, ledState);
        }
}
```

Task 4

Connect the 10K ohm potentiometer and vary the resistance

Circuit:



Code:

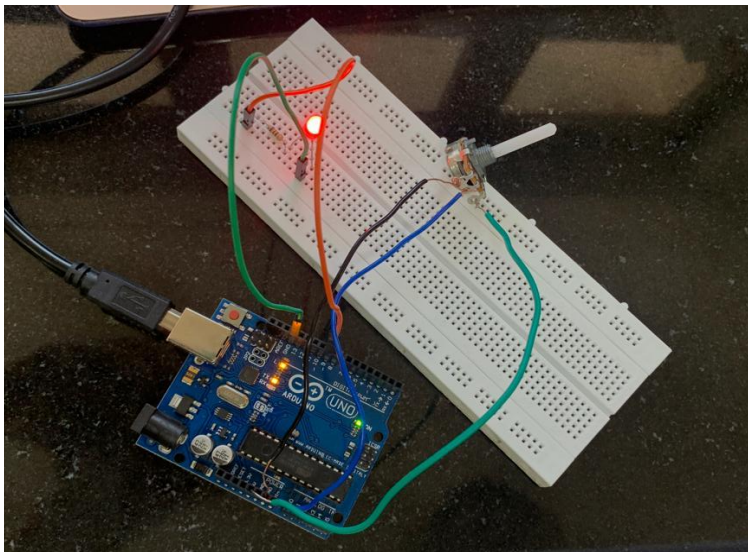
```
void setup()  {
        //initialize serial communication at 9600 bits per second
        Serial.begin(9600);
}

void loop()  {
        //read the input on analog pin 0
        int sensorValue = analogRead(A0);
```

```
 //Convert the analog reading (which goes from 0 - 1023) to a voltage (0 - 5V)
        float voltage = sensorValue*(5.0/1023.0);

        Serial.println(voltage);
}
```

Task 5

With the help of a potentiometer regulate the brightness of the external connected LED

Circuit:

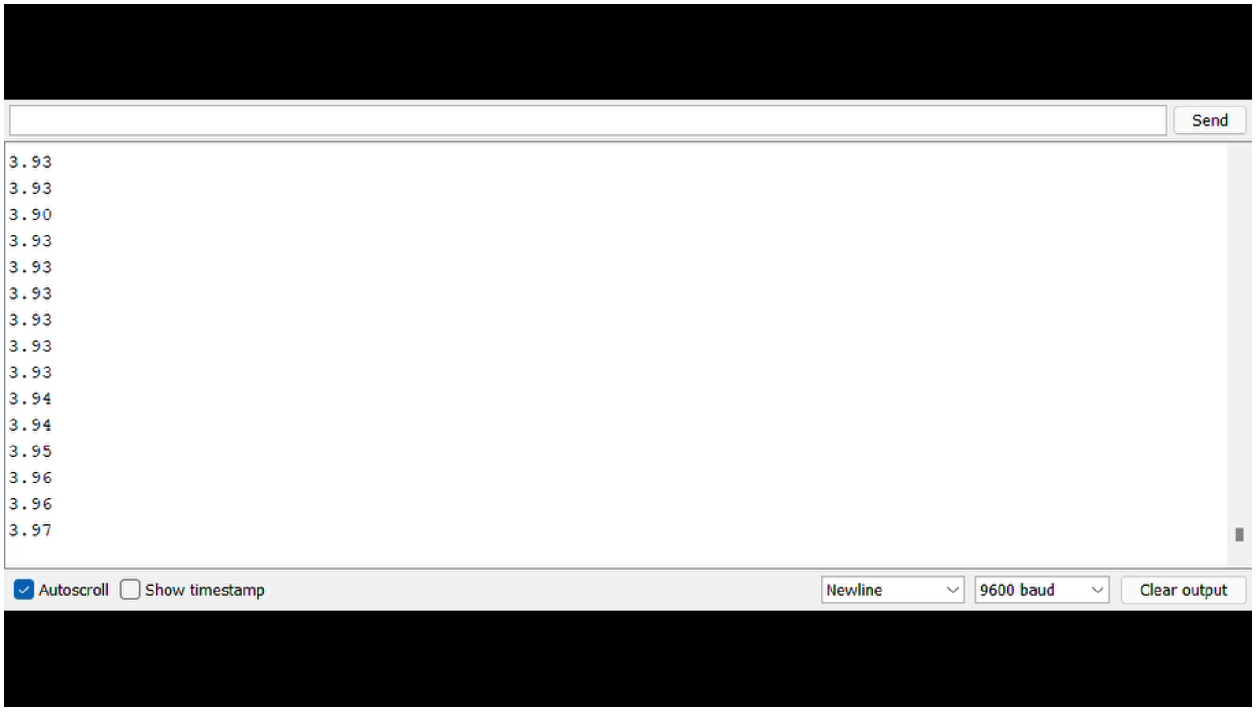


Code:

```
const int analogoutPin = A0          //Analog input pin that the potentiometer is attached to
const int analogoutPin = 9;          //Analog output pin that the LED is attached to

int sensorValue = 0;                 // value read from the pot
int outputValue = 0;                 // value output to the PWM (analog out)


void setup() {
  // initialize serial communications at 9600 bps:

        Serial.begin(9600) ;
}
```

```
void loop() {

sensorValue = analogRead (analogInPin);

outputValue = map (sensorValue, 0, 1023, 0, 255) ;

analogWrite (analogOutPin, outputValue);

//print the results to the Serial Monitor:

Serial.print("sensor =");
Serial.print (sensorValue);
Serial.print("\t output = “);
Serial.println(outputValue);

  // wait 2 milliseconds before the next loop for the analog-to-digital

delay(2);
}
```

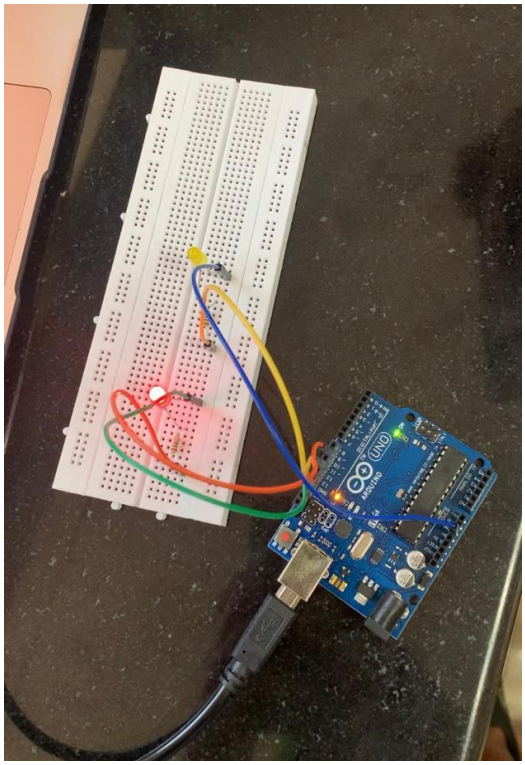
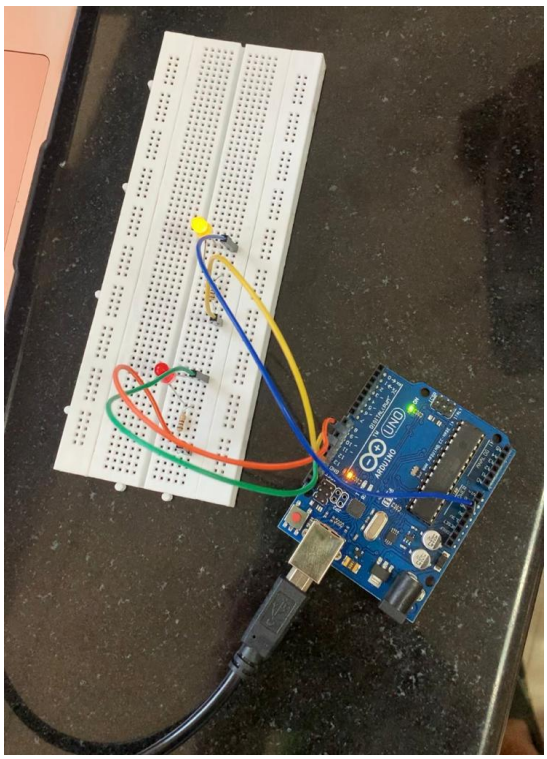
Results:
Variable Resistance



Task 6

Design a traffic signal using Arduino so that the first led glows for 15 seconds and the second LED glows for 10second?

Circuit:

Code:

```
void setup() {
  // initialize digital pin LED_BUILTIN as an output.

   pinMode(9, OUTPUT);
   pinMode(11, OUTPUT);
}

void loop(){

   digitalWrite(9, HIGH);
   delay(15000);
   digitalWrite(9, LOW);
   delay(10);              //wait

   digitalWrite(11, HIGH);
   delay(10000);
   digitalWrite(11, LOW);
```

```
    delay(10);                  //wait
}
```