

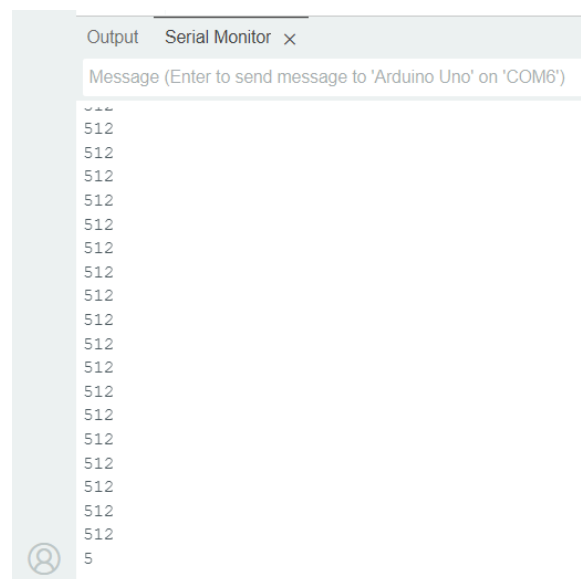
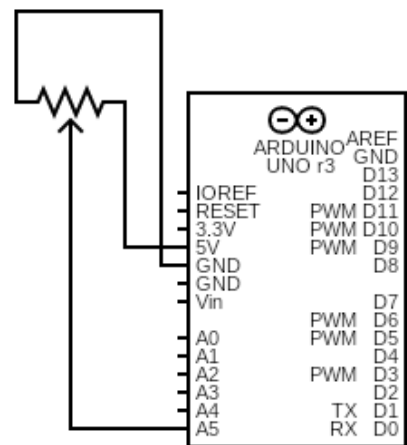
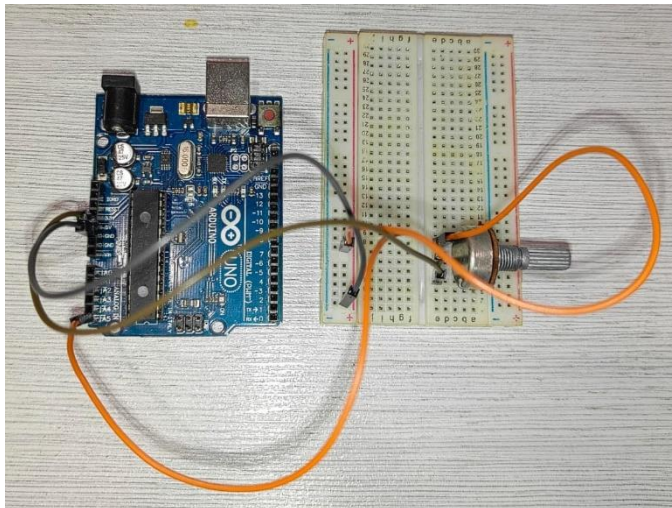
## LAB TASKS

**Q1: Develop the program to read values of potentiometer and display it on serial monitor. Set the potentiometer to its middle value and capture it using snipping tool. Now save this image and add in your lab report.**

```
void setup() {
  Serial.begin(9600); // Calling serial monitor for data display
}

void loop() {

  // put your main code here, to run repeatedly:
  Serial.println(analogRead(A5)); // Printing data to serial monitor & assigning
  analog port to read
}
```



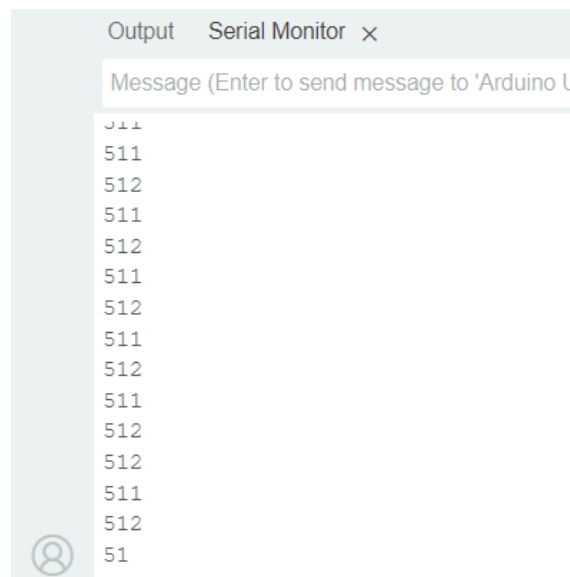
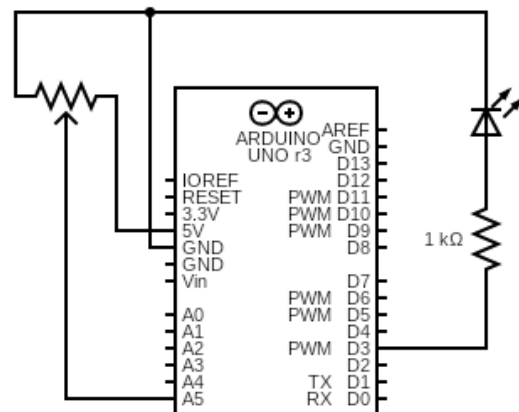
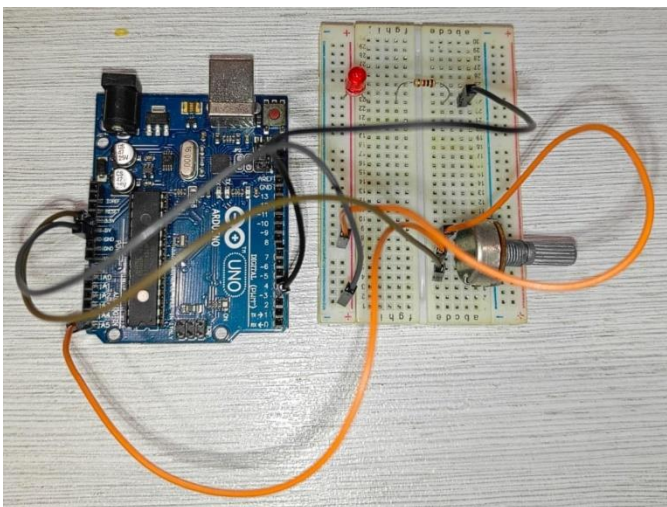
**Q2) Develop a program which controls the brightness of LED with the help of potentiometer and display its reading on serial monitor. Add this in your lab report.**

```
int potOut; // Assigning Variable to store Potentionmeter Voltage
```

```
int mapVoltage; // Assigning Variable to store Analog to Digital mapped voltage

void setup() {
  // Assigning LED input port and serial monitor initiation
  pinMode(3, OUTPUT); // Port location for Red LED
  Serial.begin(9600); // Calling serial monitor for data display
}

void loop() {
  potOut = analogRead(A5); // Reading Potentionmeter voltage and storing
  Serial.println(potOut); // Printing data to serial monitor
  mapVoltage = map(potOut, 0, 1023, 0, 255); // Mapping Analog voltage to Digital voltage
  analogWrite(3, mapVoltage); // Using mapped voltage for LED input voltage
}
```



## POST LAB TASKS

**Q1:** Suggest a circuit that can be made using Arduino and potentiometer that can be implemented at your home. Give a brief summary of their working.

A possible circuit employing Arduino and a potentiometer could be designed to automate the operation of window shutters at my home. In this setup, the potentiometer knob serves as the control interface, allowing precise adjustment of the shutter position to control the amount of light entering the room. This integration enables a dynamic and customizable solution for managing interior lighting based on my personal preferences.

**Q2: What is the purpose of map function? List all the variable that were used in your program.**

The map function in our program served the purpose of converting and storing values between two different ranges, the analog range and the digital range. The analog range spans from 0 to 1023, while the digital range is defined from 0 to 255. Within our code, a variable named "potOut" was used to store the analog signal data. Next, this potOut data was used in combination with the converting command to transform it into digital data, which was then stored in a second variable known as "mapVoltage."

**Q3: What is PWM? Explain briefly. List down the PWM pins used in your program.**

Pulse Width Modulation, or PWM, is a method used in electronics to control the amount of power sent to a device by adjusting the width of pulses in a digital signal. Instead of a continuous flow of power, PWM works by turning the power on and off at a fixed frequency. The ratio of time the power is on compared to the total time is known as the duty cycle. For instance, with a 50% duty cycle, the power is on for half the time and off for the other half.

In our experiment, we utilized the PWM pin number 3.