Experiment No. 3
Objective: Introduction with running a blinking LED and fading LED with PWM

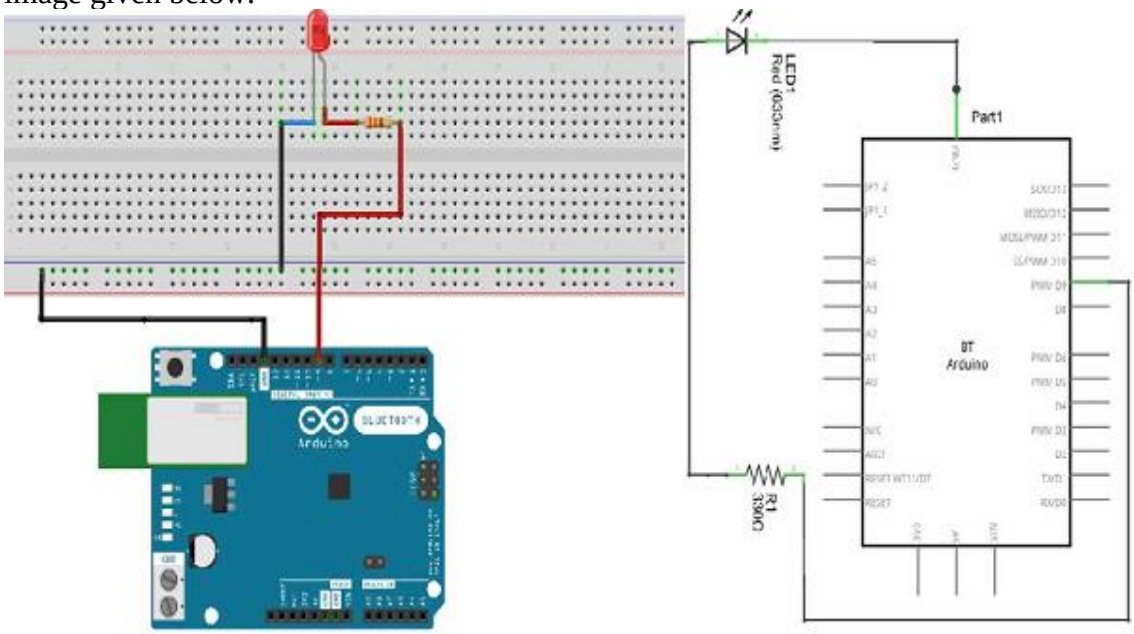
Components Required

You will need the following components −

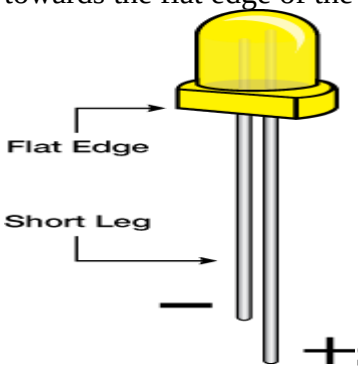
- 1 × Breadboard
- 1 × Arduino Uno
- 1 × LED
- 1 × 220Ω Resistor
- 2 × Jumper

Procedure

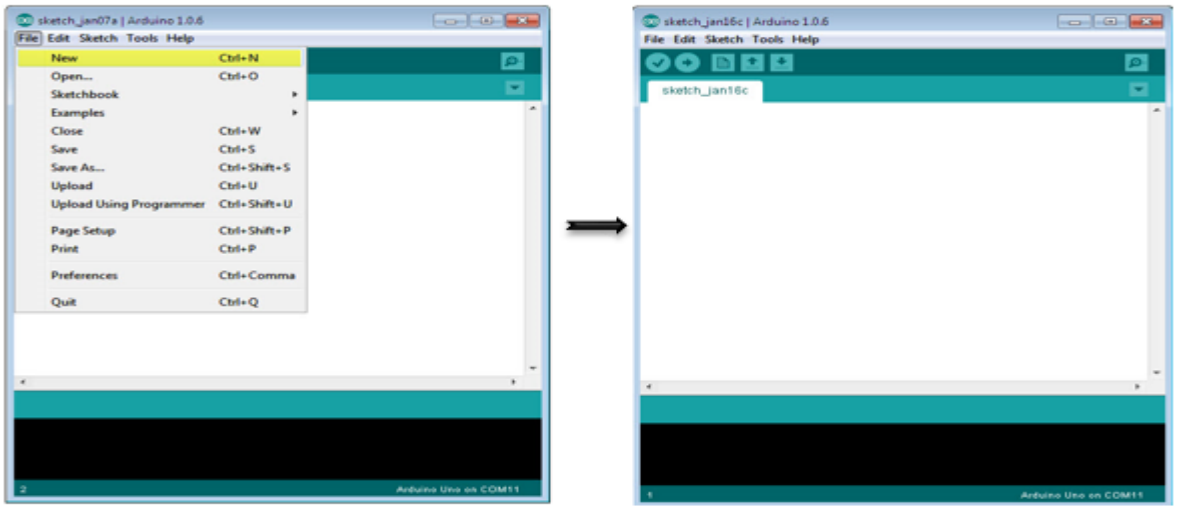
Follow the circuit diagram and hook up the components on the breadboard as shown in the image given below.



Note − To find out the polarity of an LED, look at it closely. The shorter of the two legs, towards the flat edge of the bulb indicates the negative terminal.



Open the Arduino IDE software on your computer. Coding in the Arduino language will control your circuit. Open the new sketch File by clicking New.



Arduino Code 1

```
/*
  Blink
  Turns on an LED on for one second, then off for one second, repeatedly.
*/

void setup() {
  // initialize digital pin LED_BUILTIN as an output.
  pinMode(LED_BUILTIN, OUTPUT);
}

// the loop function runs over and over again forever
void loop() {
  digitalWrite(LED_BUILTIN, HIGH);  // turn the LED on (HIGH is the voltage
level)
  delay(1000);                      // wait for a second
  digitalWrite(LED_BUILTIN, LOW);   // turn the LED off by making the voltage
LOW
  delay(1000);                      // wait for a second
}
```

Code to Note

pinMode(8, OUTPUT) − Before you can use one of Arduino's pins, you need to tell Arduino Uno R3 whether it is an INPUT or OUTPUT. We use a built-in "function" called pinMode() to do this.

digitalWrite(8, HIGH) − When you are using a pin as an OUTPUT, you can command it to be HIGH (output 5 volts), or LOW (output 0 volts).

Arduino Code 2 : To turn on and off the led for 7 times

```
#define LED 13
int count;
void setup()
{
```

```
   pinMode(LED, OUTPUT);
}
void loop()
{
    while (count <7)
{
digitalWrite(LED, HIGH);
delay(1000);
digitalWrite(LED, LOW);
delay(1000);
count = count +1;
}
}
```

Code 3: Fading using loop

```
int led = 9;
int brightness = 0;
int fadeAmount = 5;

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

void loop() {
  analogWrite(led, brightness);
  brightness = brightness + fadeAmount;
  if (brightness <= 0 || brightness >= 255) {
    fadeAmount = -fadeAmount;
  }
  delay(500);
}
```

Result: PASTE SCREENSHOTS OF OUTPUT

Question 1: Design a program that will flash the LED connected to pin 13 four times. Make the flash consist of 1 second on and 2 seconds off. Use pin 8 to reset the flashing so that it will restart when pin 8 is grounded.

Result: PASTE SCREENSHOTS OF OUTPUT

Question 2: How can you modify an Arduino sketch to make an LED blink on and off for exactly 7 times before stopping?

Result: PASTE SCREENSHOTS OF OUTPUT