Bahria University

Karachi Campus

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Description automatically generated

LAB EXPERIMENT NO.

**8**

LIST OF TASKS

|  |  |
| --- | --- |
| TASK NO | OBJECTIVE |
| 1 | Use external interrupt in Arduino UNO. |
| 2 | Write a program to use timer interrupt in Arduino Uno |
| 3 | Using the concept of interrupts you have learnt, develop a program that uses interrupt. |

Submitted On:

29 December 2023

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(Date: DD/MM/YY)

**Task 1:** Use external interrupt in Arduino UNO.

**Solution:**

void setup() {

  pinMode(11, OUTPUT);

  pinMode(13, OUTPUT);

  pinMode(2, INPUT);

  attachInterrupt(digitalPinToInterrupt(2), routine, CHANGE);}

void loop() {

  digitalWrite(11, HIGH);

  delay(1000);

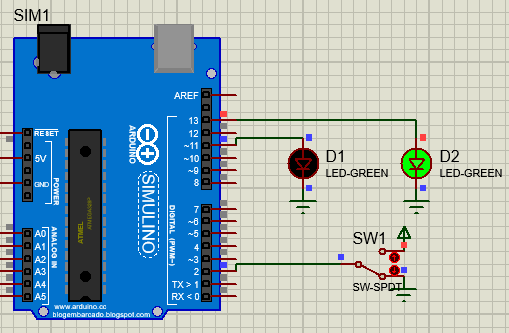
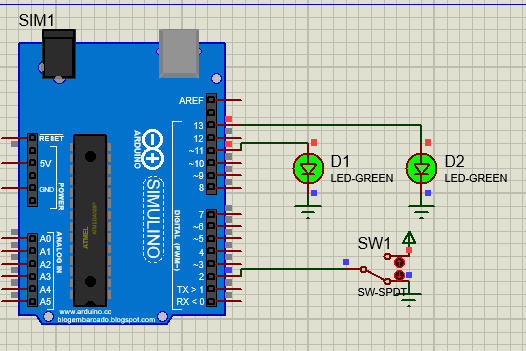
  digitalWrite(11, LOW);

  delay(1000);}

void routine() {

  digitalWrite(13, HIGH);}

**Output:**



**Task 2:** Write a program to use timer interrupt in Arduino Uno.

**Solution:**

#include <LiquidCrystal.h>

#include <TimerOne.h>

int led = 2;    // led connect to pin 2 of arduino

int led\_i = 3;  // led\_i connect to pin 3 of arduino

int x = 0;

LiquidCrystal lcd(12, 11, 10, 9, 8, 7);  // arduino pins for lcd connections

void setup() {

  pinMode(led, OUTPUT);

  pinMode(led\_i, OUTPUT);

  pinMode(4, INPUT);

  lcd.begin(16, 2);

  Timer1.initialize(4000000);  /// 4 sec timer

  Timer1.attachInterrupt(interrupt);}

void interrupt() {

  lcd.setCursor(0, 0);

  lcd.print("Timer1 interrupt");  // ISR

  if (x == LOW) {

    digitalWrite(3, HIGH);

    x = HIGH;

  } else {

    digitalWrite(3, LOW);

    x = LOW;}}

void loop() {

  delay(500);

  lcd.clearxx`x`();

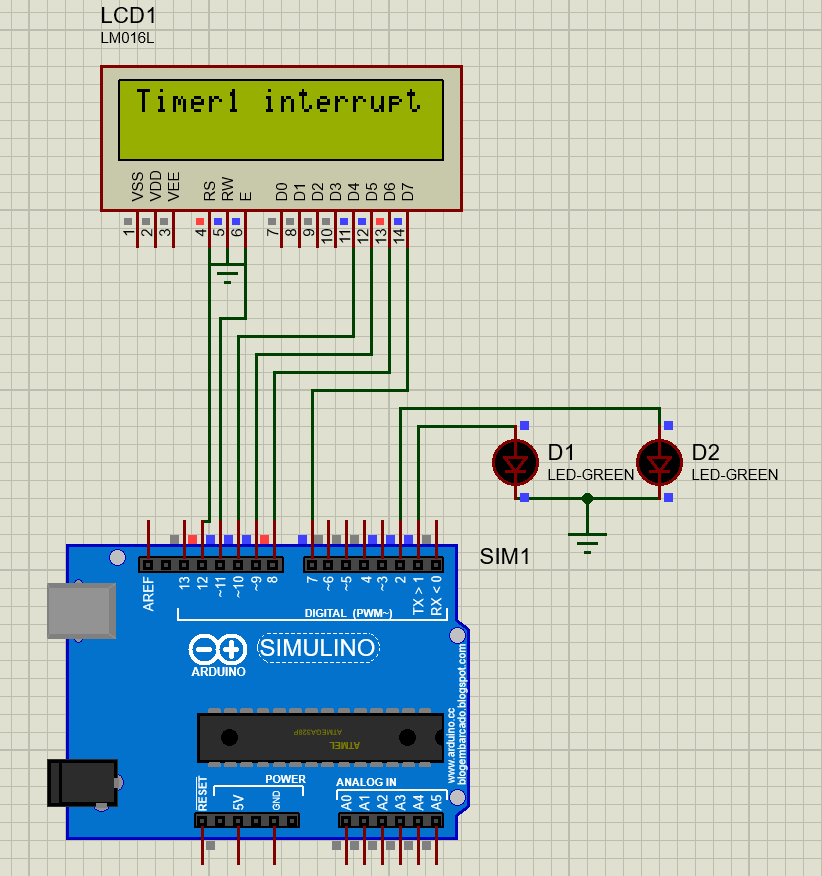
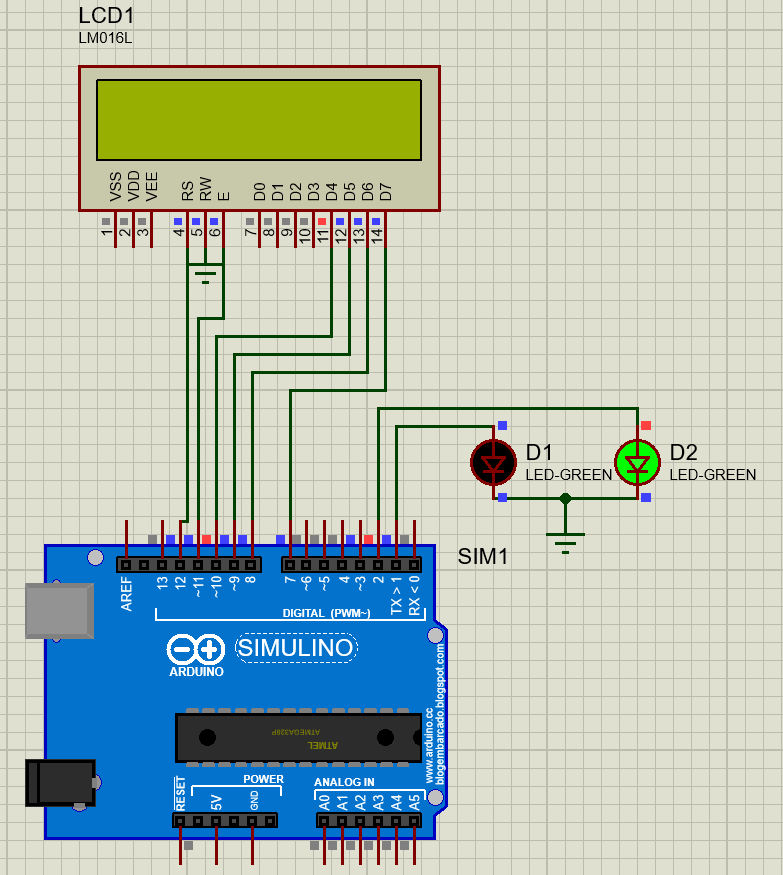
  digitalWrite(2, HIGH);

  delay(1000);

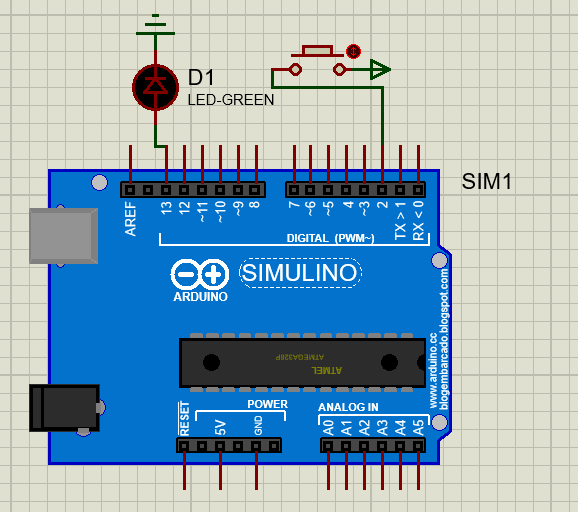
  digitalWrite(2, LOW);

  delay(1000);}

**Output:**

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**Task 3:** Using the concept of interrupts you have learnt, develop a program that uses interrupt.

**Solution:**

#define LED\_PIN 13

#define BTN\_PIN 2

void INT0\_ISR(void){

  digitalWrite(LED\_PIN, !digitalRead(LED\_PIN));}

void setup(){

  pinMode(LED\_PIN, OUTPUT);

  pinMode(BTN\_PIN, INPUT);

  attachInterrupt(digitalPinToInterrupt(BTN\_PIN),

INT0\_ISR, RISING);}

void loop(){}

**Output:**