NORTH SOUTH UNIVERSITY

ASSIGNMENT

SOFTWARE LAB-7 8051 MCS MICROC PROGRAMMING TO TURN ON/OFF WITH A DELAY FUNCTION

NAME: Syed Niamul Kazbe Rayian

ID: 2021931642

SUBMISSION DATE: 16th March 2023

SUMISSION TO: Syed Mahmud Husain (SMH2)

TITLE: MICROC PROGRAMMING WITH A DELAY FUNCTION

Most of the controllers have inbuilt timers. These timers are not only used for generating time delay but also used for counting purpose. The value of the counter is incremented by 1 when an action or an event occurs. Timers on the other hand are used to generate delays. Timers in a microcontroller are controlled by the SFRs (Special Function Registers). Timers in different mode of operations are configured by special function registers. The main principle behind this project is to generate a Delay using 8051 Timers with the help of its Special Function Registers.

COMPONENTS:

- AT89C51
- LED-Yellow

CIRCUIT:

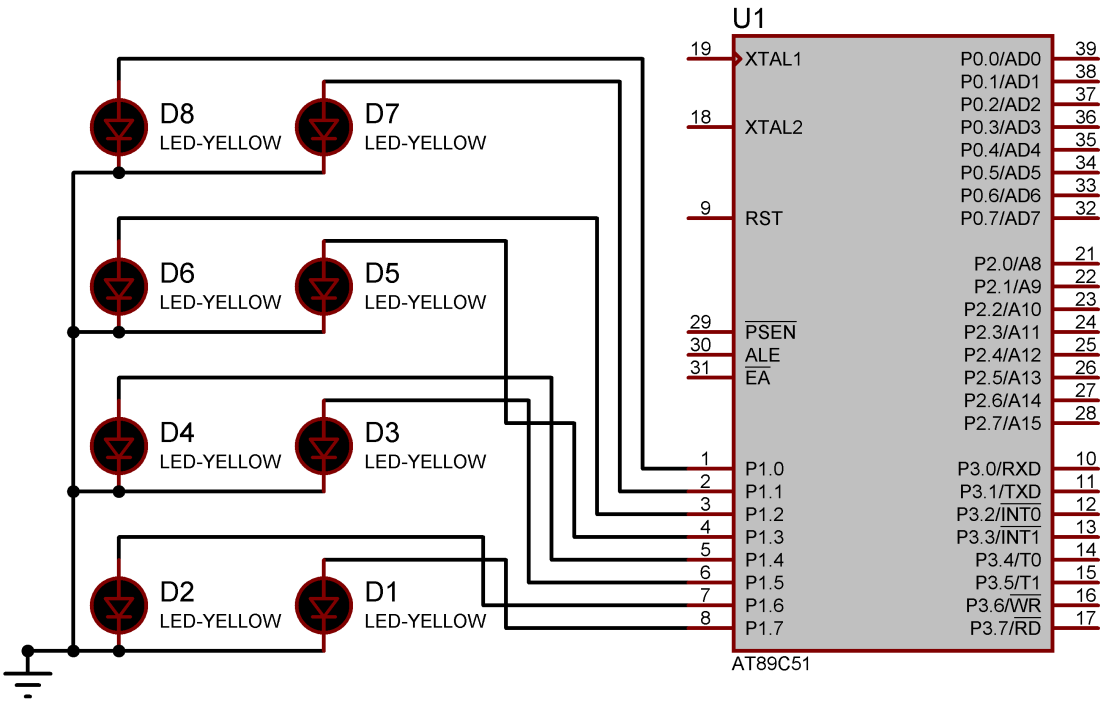

Figure 1: The circuit diagram of micro controller with 8 leds.

In the above figure, 8051 micro controller is interfaced with LEDs and connected to ground. Over here, only the P1 ports are used to control the LEDs, where first LED is connected to 8^{th} port of the P1 and others respectively, and all the LEDs are connected to the ground on the same wire.

SIMULATION:

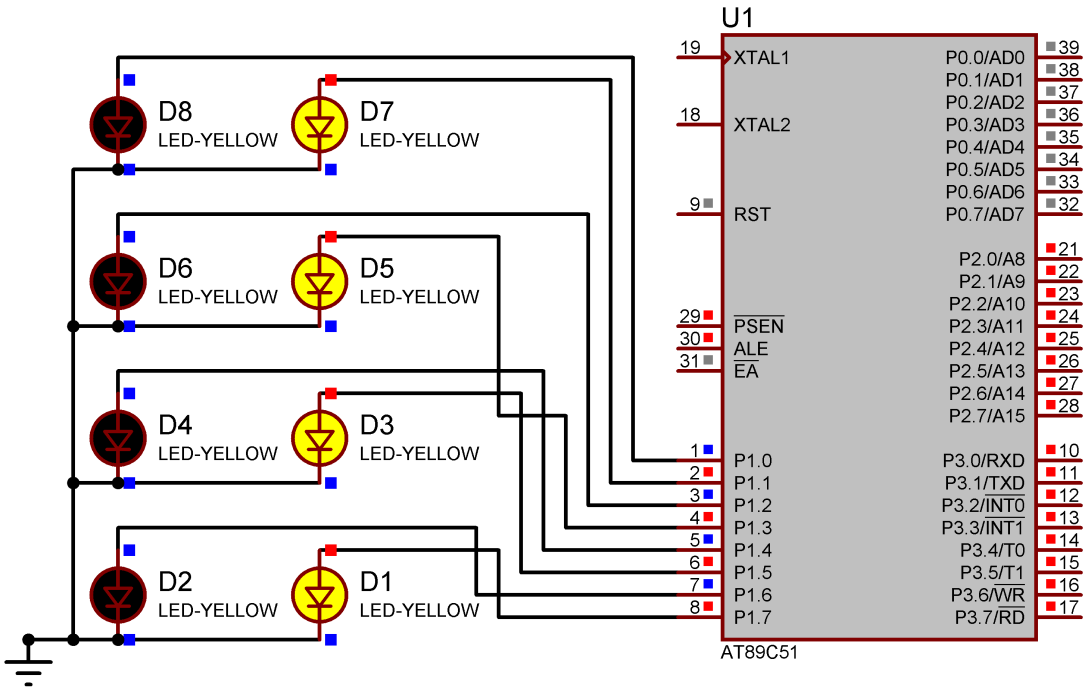

Figure 2: The circuit diagram of micro controller with 4 LEDs lighting.

In the above figure, 8051 micro controller is interfaced with LEDs and connected to ground. Over here, only the P1 ports are used to control the LEDs, the odd number LEDs are getting the values passed through the controller where positive end of the LEDs are receiving 1 of the odd LEDs, and evens are receiving 0.

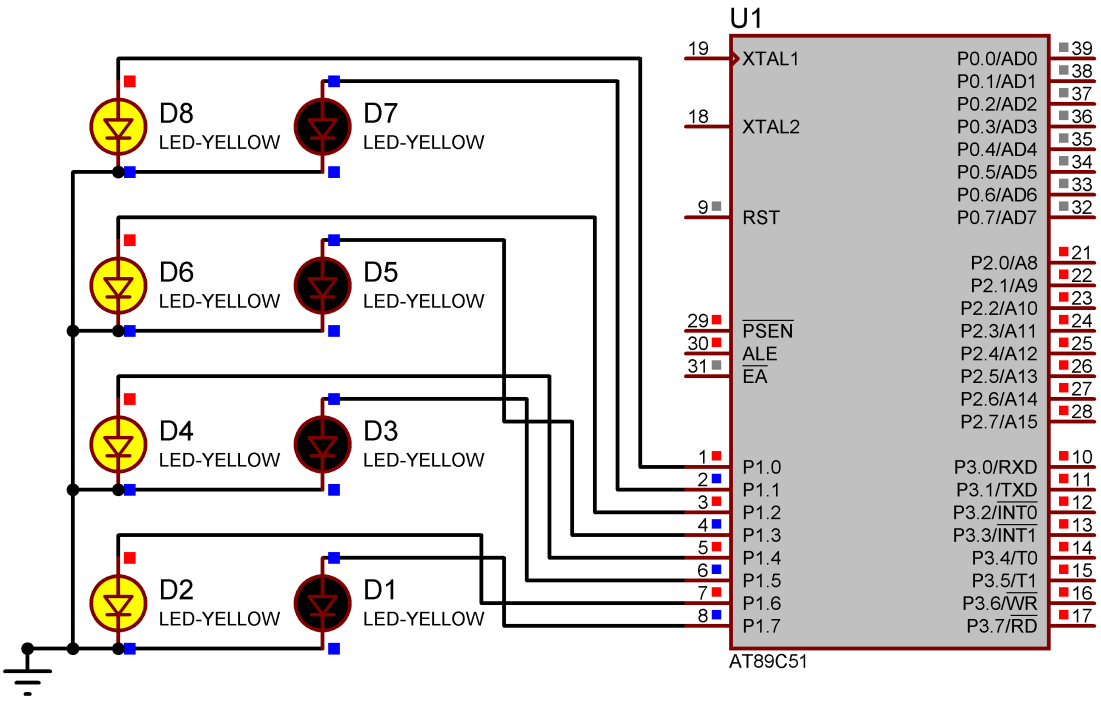

Figure 3: The circuit diagram of micro controller with 4 LEDs lighting.

In the above figure, 8051 micro controller is interfaced with LEDs and connected to ground. Over here, only the P1 ports are used to control the LEDs, the even number LEDs are getting the values passed through the controller where positive end of the LEDs are receiving 0 of the odd LEDs, and evens are receiving 1.

COMPILATION CODE:

```
#include<reg51.h>
void DELAY(void);
unsigned char i;
void main(void){
        while(1){
```

```
            P1 = 0x55;
            DELAY();
            P1 = 0xAA;
            DELAY();
        }
}

void DELAY(void){
        TMOD = 0x01;
        for(i=0;i<20;i++){
        TH0 = 0x35;
        TL0 = 0x00;
        TR0 = 1;
        while(TF0==0);
        TR0 = 0;
        TF0 = 0;
        }
}
```

DISCUSSION:

For this experiment, in Keil uVision5, I have written the code for delay timer and its function, in order to run the code, register 51 library function is included and then DELAY function is created with no return, and a variable is defined as an unsigned character which will be required to perform a loop. Then inside the main function, a while condition is used whose value is true until 1, where P1 will receive a value the delay function is called for 1 second. TF0 bit is automatically set when the Timer 0 overflow. TR0 bit enables the timer 0, the 16-bit register of Timer 0 is accessed as low- and high-byte. The low-byte register is called TL0 (Timer 0 low byte) and the high-byte register is called TH0 (Timer 0 high byte). In the Proteus 8, 8051 micro controller is interfaced with LEDs and connected to ground. Over here, only the P1 ports are used to control the LEDs that controls the odd or even number LEDs which are getting the values passed from the controller, positive end of the LEDs are receiving 0 of the odd LEDs, and evens are receiving 1 when the even numbered LEDs are lighting up and vice versa for odd number LEDs.