EXPERIMENT NO - 3

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20BCS046

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AIM-

To design counter based on four switches as input using 8051 board.

Hardware Used - Computer System, 8051 Microcontroller kit, USB connectors.

Software Used - Keil Micro-vision IDE, Flash Magic tool.

Pins Used -

LED	PORT	VARIABLE	USE
D1	P3.0	RxD	Serial Data Receive Pin
D2	P3.1	TxD	Serial Data Transmit Pin
D3	P3.6	WR	External Memory Read
D4	P3.7	RD	External Memory Write
SW1	P3.2	INT0	Switch 1
SW2	P3.3	INT1	Switch 2
SW3	P3.4	T0	Switch 3
SW4	P3.5	T1	Switch 4

Procedure -

- The C Code checks for the switch configuration on the 8051 micro-controller.
- If Switch 1 is on, it executes the code for 1-bit counter with some delay.
- If Switch 2 is on, it executes the code for 2-bit counter with some delay.
- If Switch 3 is on, it executes the code for 3-bit counter with some delay.

C Code

```
#include <p89v51rx2.h>
sbit l1 = P3 ^ 0;
sbit l2 = P3 ^ 1;
sbit l3 = P3 ^ 6;
sbit l4 = P3 ^ 7;
sbit s0 = P3 ^ 2;
sbit s1 = P3 ^ 3;
sbit s2 = P3 ^ 4;
sbit s3 = P3 ^ 5;
void delay(unsigned int x)
{
    unsigned int i, j;
    for (i = 0; i <= 1000; i++)
    {
```

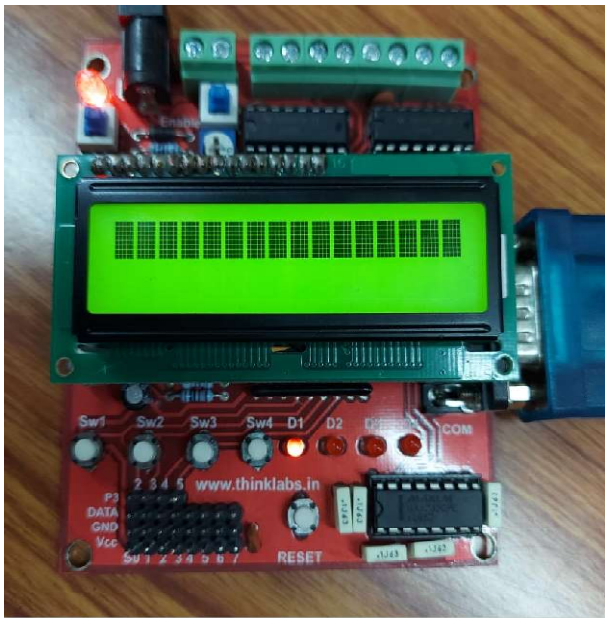
```
        for (j = 0; j <= x; j++)
        {
        }
    }
}

void counter(unsigned int n)
{
    int i = 0;
    for (i = n - 1; i >= 0; i--)
    {

        if(i & (1){
            l1 = 0;
        }else{
            l1 = 1;
        }
        if(n>=4){
            if (i & (2))
            {
                l2 = 0;
            }
            else
            {
                l2 = 1;
            }
    }
        if(n>=8){
            if (i & (8))
            {
                l3 = 0;
            }
            else
            {
                l3 = 1;
            }
    }

if(n>=16){
            if (i & (16))
            {
                l4 = 0;
            }
            else
            {
                l4 = 1;
            }
    }
delay(200);
    }
}

void main(void)
{
```

```
    while (1)
    {
        if (s0 == 0)
            counter(2);
        if (s1 == 0)
            counter(4);
        if (s2 == 0)
            counter(8);
        if (s3 == 0)
            counter(16);
    }
}
```

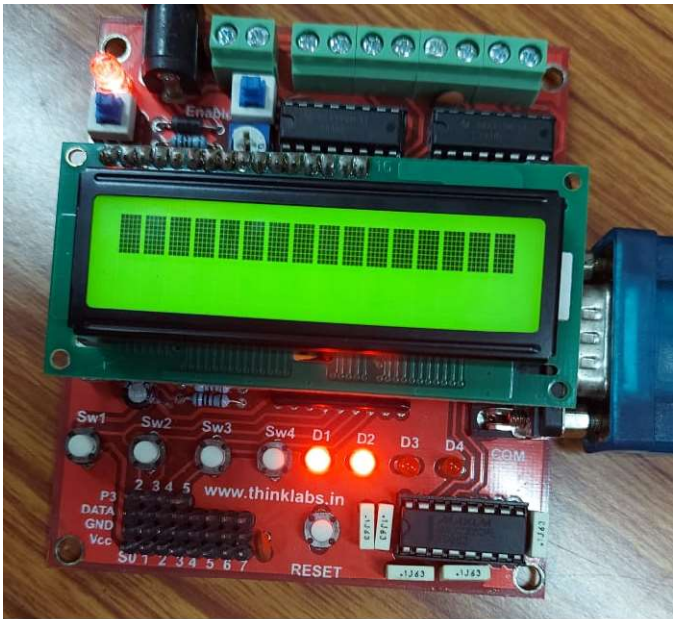
Result

The C program for counters based on corresponding switches as input is implemented and verified using appropriate software.

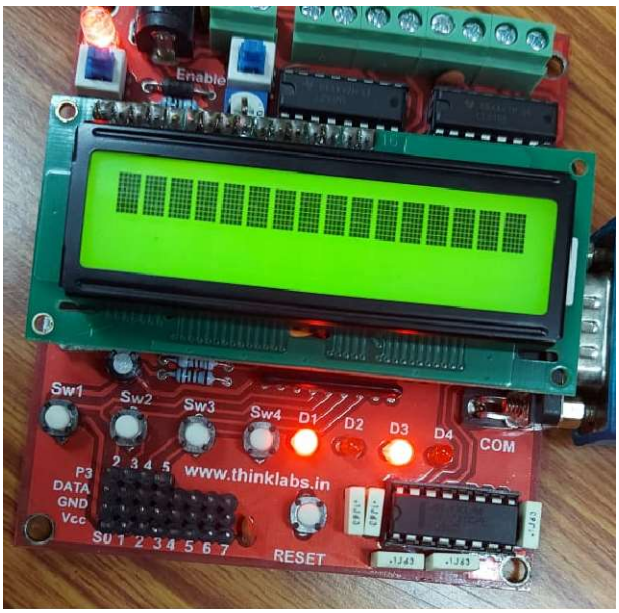
Output



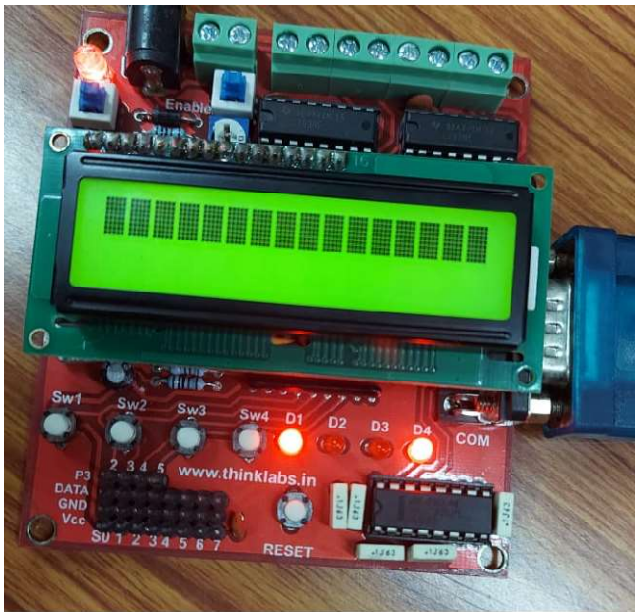
1-bit Counter for switch 1



2-bit Counter for switch 2



3-bit Counter for switch 3



4-bit Counter for switch 4