

AIM-

Design and implement an embedded system that interfaces an 8051 Micro-controller by taking input from switch and then completes its cycle (4-bit counter) with a buzzer at the completion of counter.

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.
- Based on the switches pressed as binary 1/0, number is calculated which acts as a starting point for 4-bit counter.
- On completion of one round, buzzer beep is heard and again begins the 4 bit counter.
- Brute force approach has been used to make 4-bit counter.

C Code

```
#include<p89v51rx2.h>

sbit buzzer = P0^3;

void delay(unsigned int dela){
    unsigned int i, j;
    for(i =0; i<=1000; i++)
        for(j=0; j<= dela; j++);
}
```

```

void main(void)
{
    RxD = 1;
    TxD = 1;
    WR = 1;
    RD = 1;
    while(1)
    {
        delay(200);
        if( RxD == 1 && TxD == 1 && WR == 1 && RD == 1 && !(INT0 ==1 && INT1==1 &&
T1==1 && T0==1) )
        {
            buzzer = 0;
            delay(50);
            buzzer = 1;
            delay(100);
            RxD = INT0;
            TxD = INT1;
            WR = T0;
            RD = T1;

        }

        else if(RD == 0)
        {
            #T1=1;
            RD=1;
        }
        else if(WR == 0)
        {
            #T0=1;
            WR=1;
            #T1=0;
            RD =0;
        }
        else if(TxD == 0)
        {
            #INT1=1;
            TxD =1;
            #T0=0;
            WR=0;
            #T1=1;
            RD =0;
        }
        else if(RxD == 0)
        {
            #INT0 =1;
            RxD =1;
            #INT1=0;
            TxD =0;
            #T0=1;
            WR=0;
            #T1=0;
            RD =0;
        }
    }
}

```

```
}  
  
}  
}
```

Result

Above C program checks for the switches and executes the counter and buzzer accordingly.

Output

