

# MIT ACADEMY OF ENGINEERING, Alandi (D)

(An Autonomous Institute Affiliated to Savitribai Phule Pune University)

School of Electrical Engineering

AY: 2020 - 2021

ET233 Microcontroller and Interfacing

PRACTICAL NO.--2

PIC 18F4520

a) LED's, Switch, Relay, Buzzer Interfacing and Embedded C Program

b) 7 segment Display

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Write a program for interfacing switch, LED, relay & buzzer as follows

- A. when switch 1 is pressed relay and buzzer is turned OFF and LED's ON
- B. when switch 2 is pressed relay and buzzer is turned ON and LED'S OFF.
- C. Design & implement event counter using switch, Buzzer & 7segment Display

# Hardware Required

- PIC 18F4520 Microcontroller IC
- 8 LED's
- Reset Switch
- Resistors
- PORTD – 8 pins
- + 5v supply & Ground

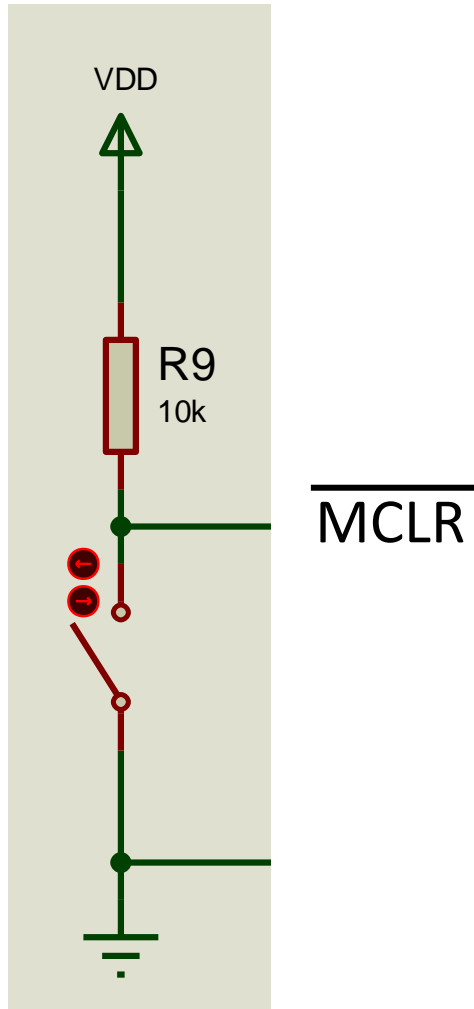
# PIC 18F 4520 Pinout

U1

2	RA0/AN0/C1IN-	RC0/T1OSO/T13CKI	15
3	RA1/AN1/C2IN-	RC1/T1OSI/CCP2B	16
4	RA2/AN2/C2IN+/VREF-/CVREF	RC2/CCP1/P1A	17
5	RA3/AN3/C1IN+/VREF+	RC3/SCK/SCL	18
6	RA4/T0CKI/C1OUT	RC4/SDI/SDA	23
7	RA5/AN4/SS/HLVDIN/C2OUT	RC5/SDO	24
14	RA6/OSC2/CLKO	RC6/TX/CK	25
13	RA7/OSC1/CLKI	RC7/RX/DT	26
33	RB0/AN12/FLT0/INT0	RD0/PSP0	19
34	RB1/AN10/INT1	RD1/PSP1	20
35	RB2/AN8/INT2	RD2/PSP2	21
36	RB3/AN9/CCP2A	RD3/PSP3	22
37	RB4/KBI0/AN11	RD4/PSP4	27
38	RB5/KBI1/PGM	RD5/PSP5/P1B	28
39	RB6/KBI2/PGC	RD6/PSP6/P1C	29
40	RB7/KBI3/PGD	RD7/PSP7/P1D	30
		RE0/RD/AN5	8
		RE1/WR/AN6	9
		RE2/CS/AN7	10
		RE3/MCLR/VPP	1

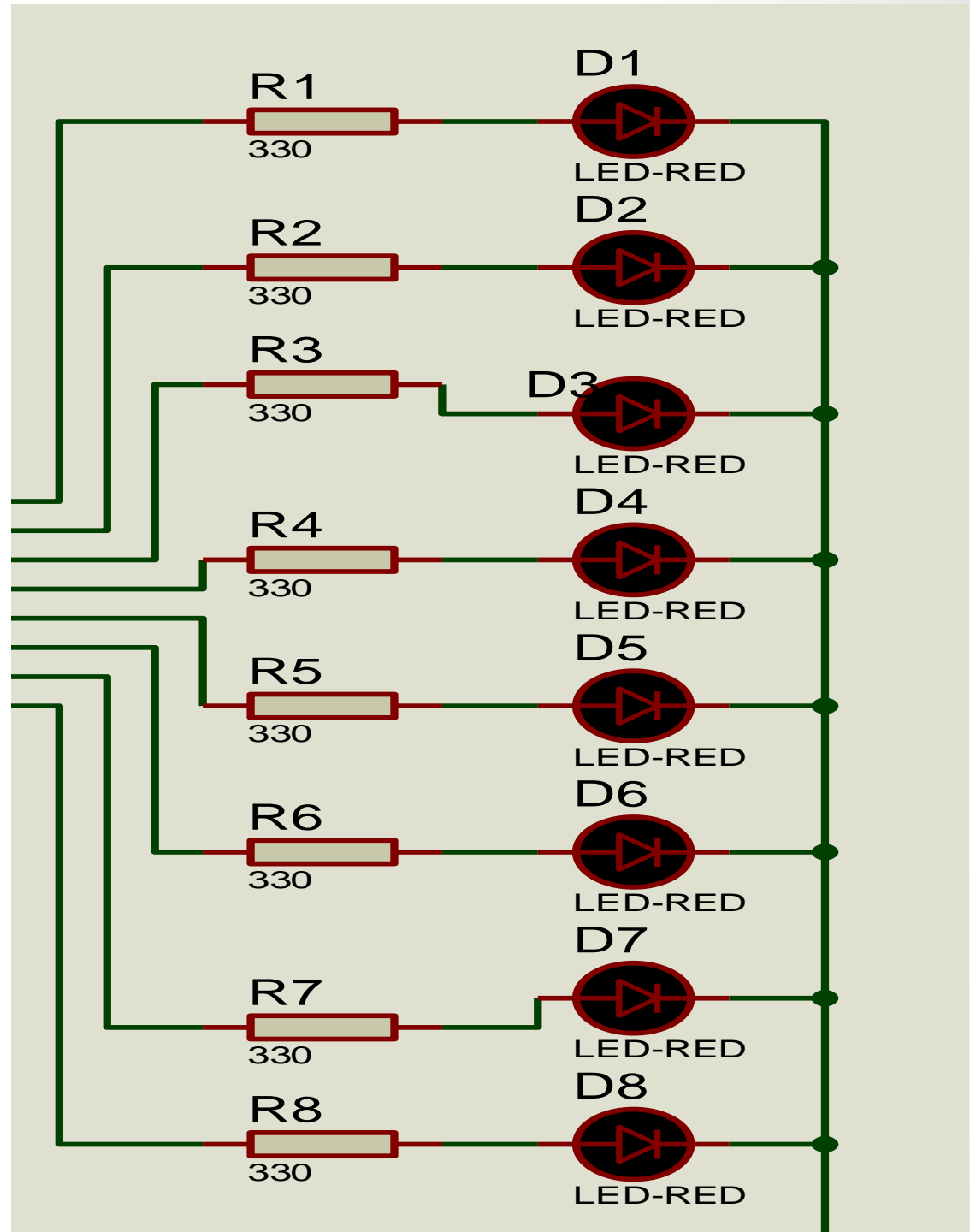
PIC18F4520

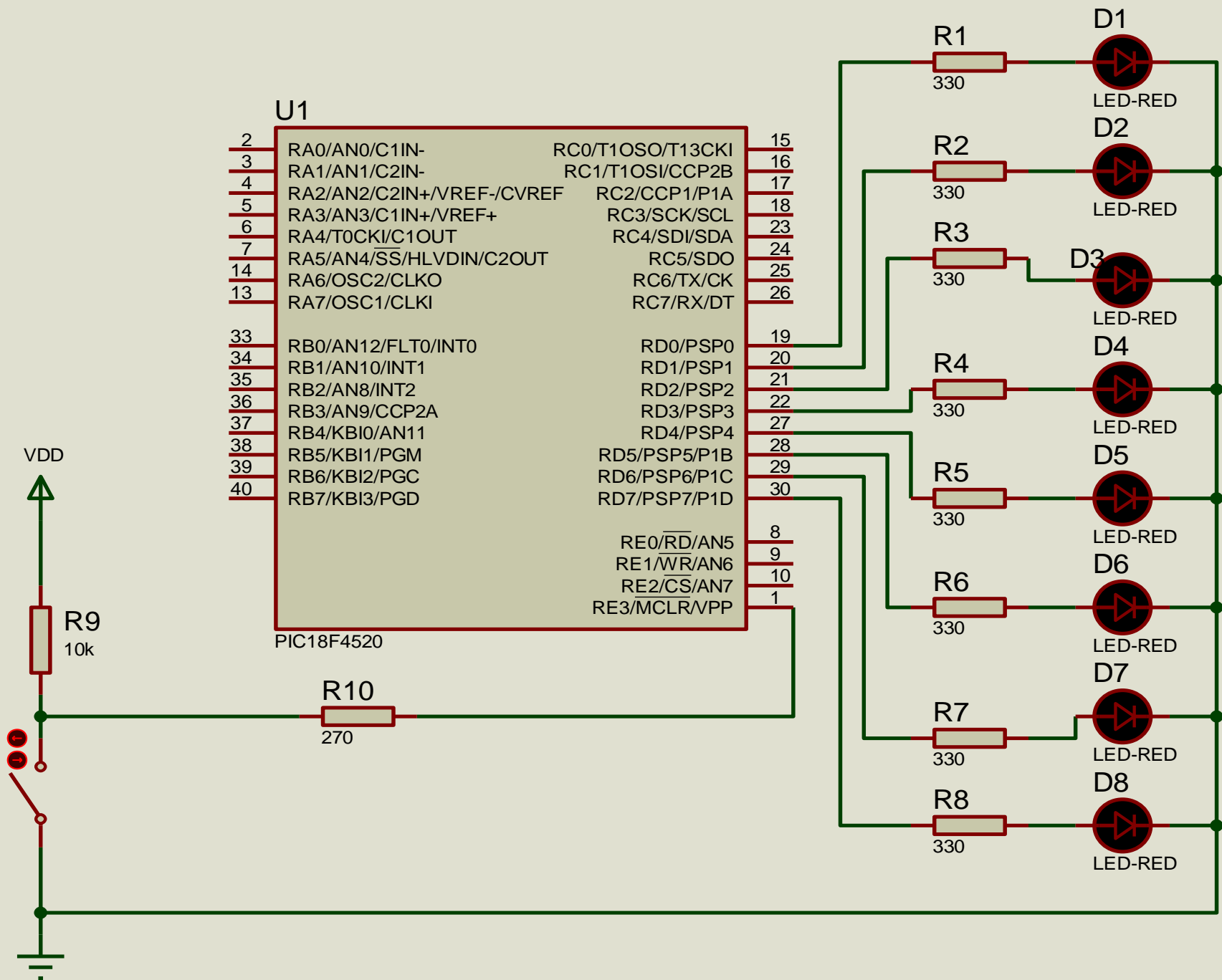
# Master Clear (Reset) pin



- LED Connection

PIC 18F4520  
Port pins

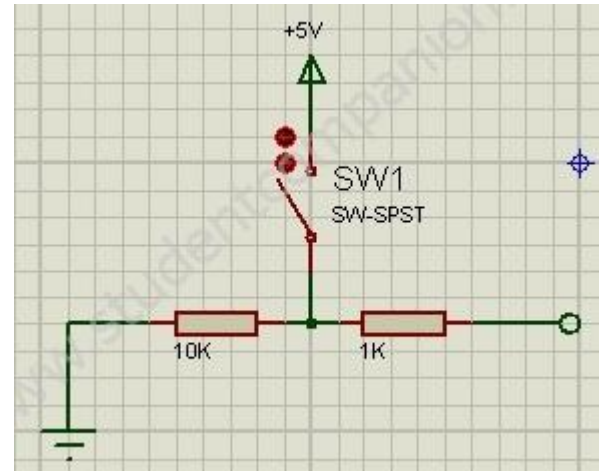




# Switch



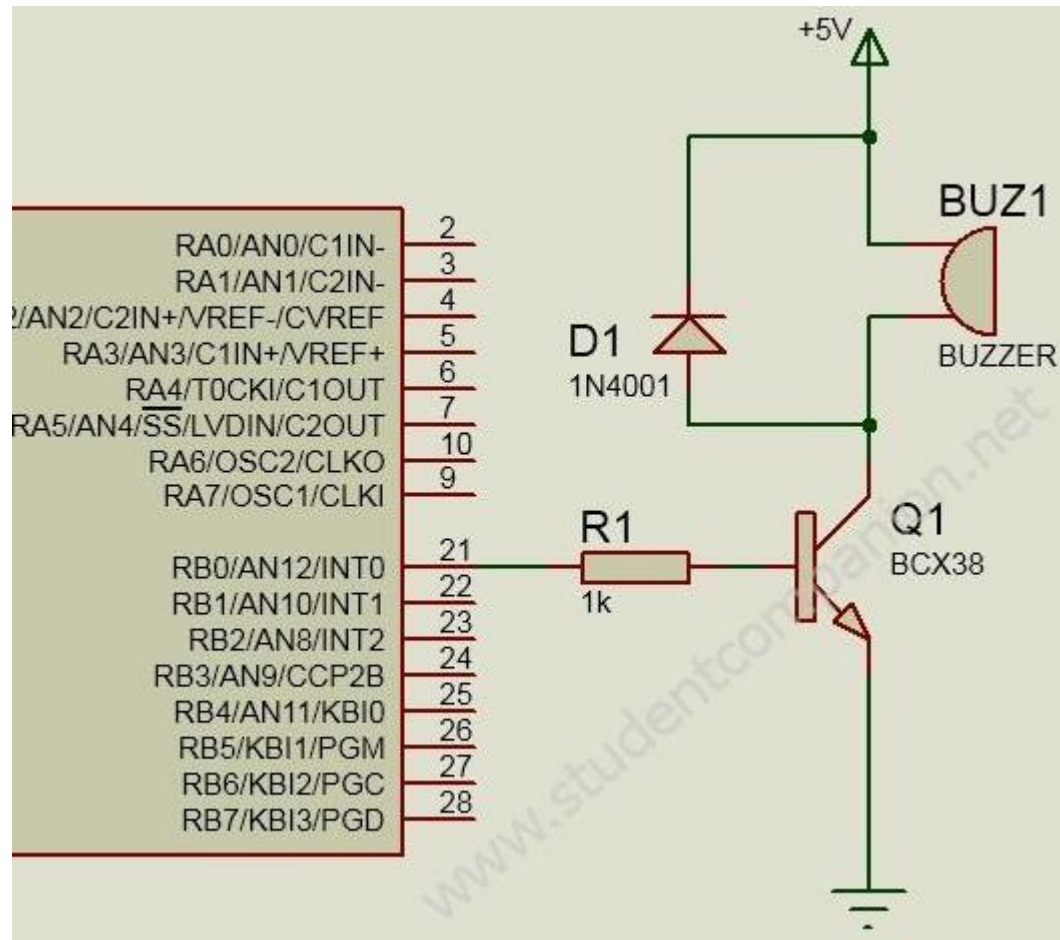
A Switch with a Pull-Up resistor



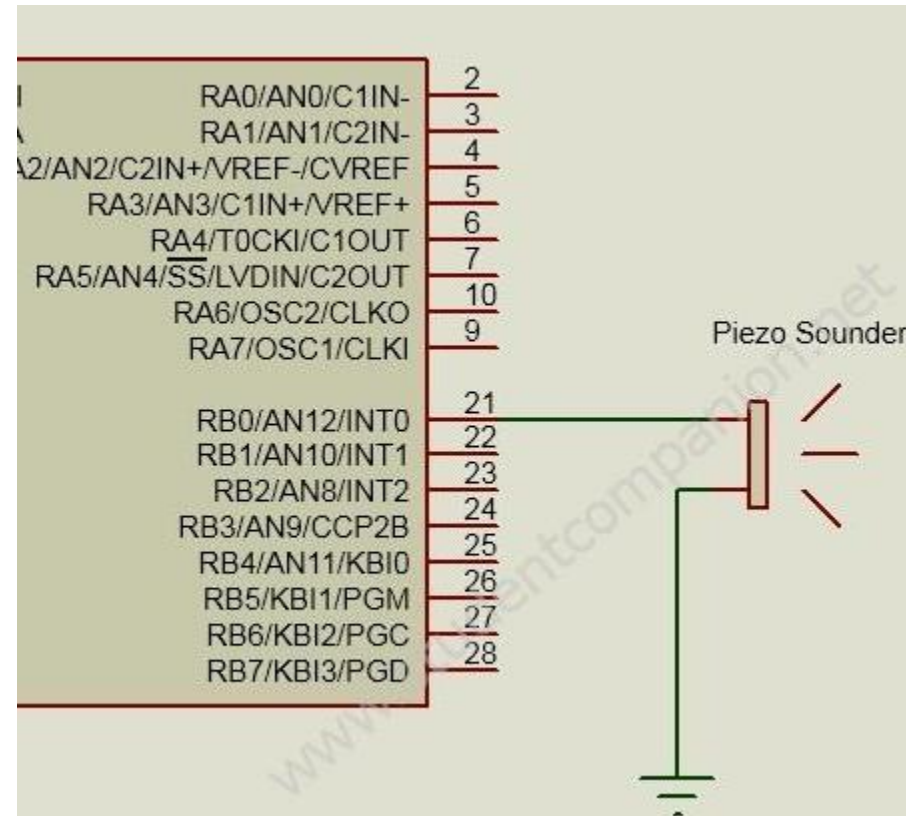
A Switch with a Pull-Down resistor



# Buzzer

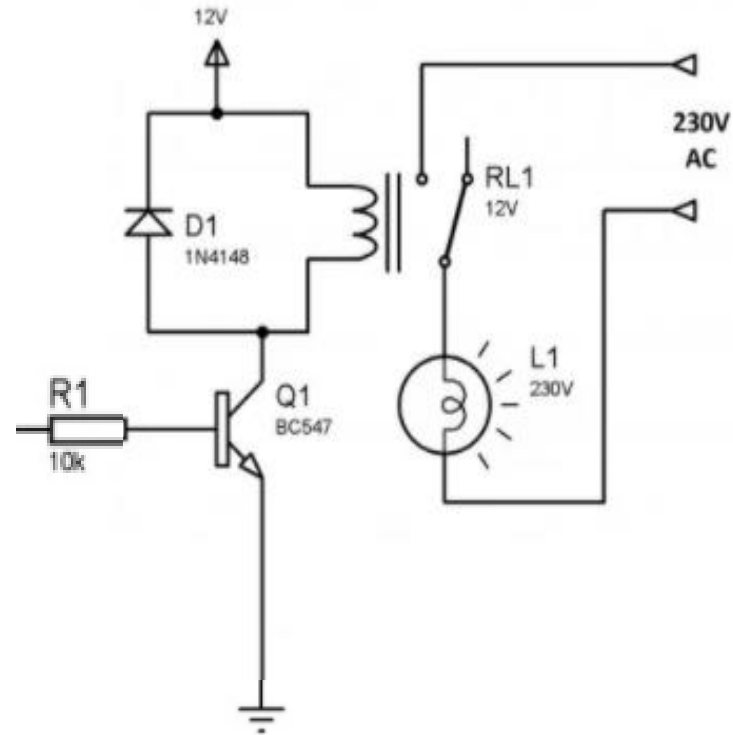


# Buzzer



# Relay

PIC 18F4520 Port pin



# Embedded C Program

```
#include<PIC18F4520.h>
#pragma config OSC = HS
#pragma config PWRT=OFF
#pragma config WDT=OFF
#pragma config DEBUG=OFF, LVP=OFF
void msdelay(int a);

#define sw1 PORTBbits.RB7
#define sw2 PORTBbits.RB6
#define relay PORTCbits.RC7
#define buzzer PORTBbits.RB0
#define LED PORTD
```

# Embedded C Program

// Initialization of PORT's in PIC

```
void main() {  
    TRISD =0;  
    TRISC=0;  
    TRISB= 0xC0;  
    LED=0;  
    relay=0;  
    buzzer =0;
```

# Embedded C Program

```
while(1)
```

```
{
```

```
    if(sw1==0 & sw2==1)
```

```
    {
```

```
        LED = 0xFF;
```

```
        relay =0;
```

```
        buzzer=0;
```

```
        msdelay(1000);
```

```
    }
```

```
        if(sw1==1 & sw2==0)
```

```
        {
```

```
            LED = 0;
```

```
            relay =1;
```

```
            buzzer=1;
```

```
            msdelay(1000);
```

```
        }
```

```
    }
```

```
}
```

# Embedded C Program

```
void msdelay(int a)
{
    for(int b=0;b<100;b++)
        for(int c=0;c<a;c++);
}
```

# 7 segment display

- **Common Cathode (CC)**
- **Common Anode (CA)**

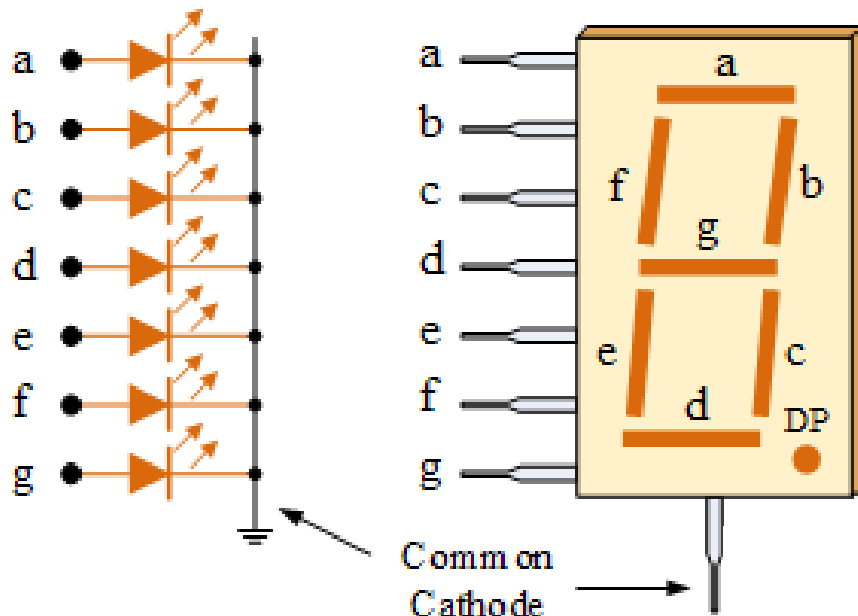


7-segment Display

<https://www.electronics-tutorials.ws/blog/7-segment-display-tutorial.html>

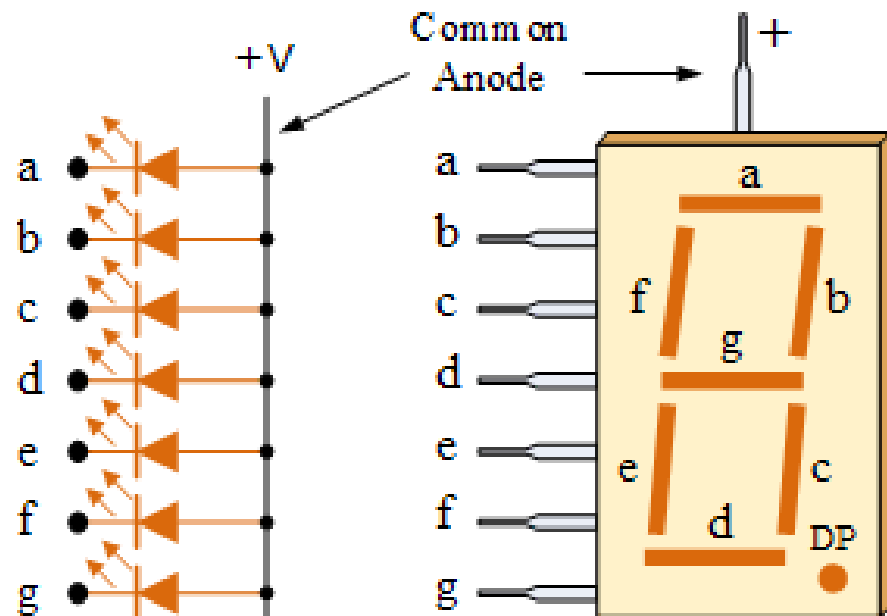
Reference



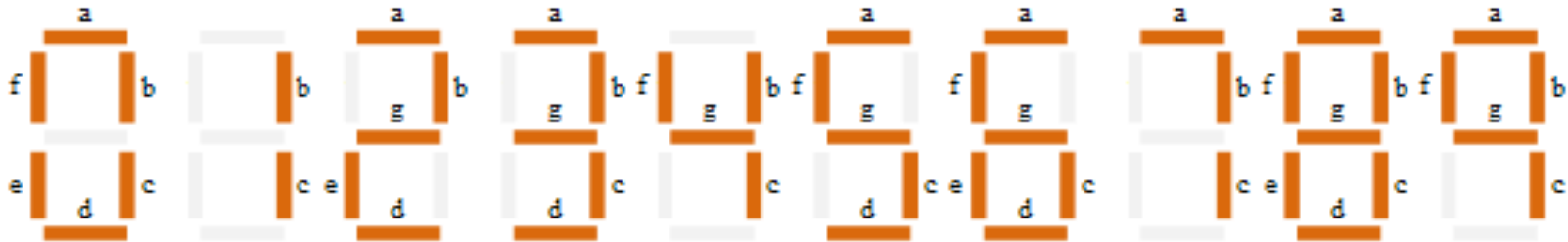


**Common Cathode 7-segment Display**

**Common Anode 7-segment Display**



# 7-Segment Display Segments for all Numbers

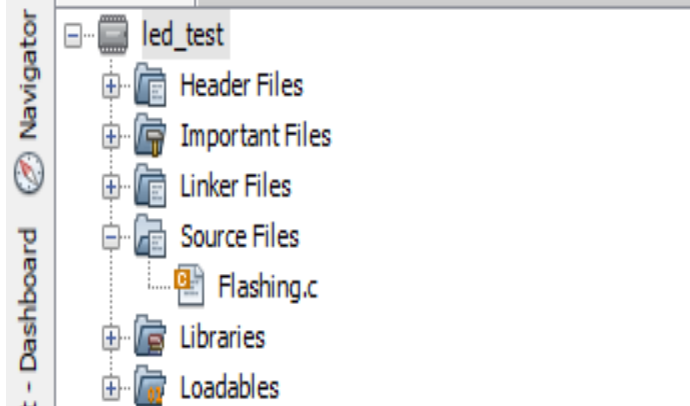


Number	A B C D E F G	PORTD (Hex)
0	0 0 1 1 1 1 1 1	0x3F
1	0 0 0 0 0 1 1 0	0x06
2	0 1 0 1 1 0 1 1	0x5B
3	0 1 0 0 1 1 1 1	0x4F
4	0 1 1 0 0 1 1 0	0x66
5	0 1 1 0 1 1 0 1	0x6D
6	0 1 1 1 1 1 0 1	0x7D
7	0 0 0 0 0 1 1 1	0x07
8	0 1 1 1 1 1 1 1	0x7F
9	0 1 1 0 1 1 1 1	0x6F

```
#include<PIC18F4520.h>
void msdelay(int a);
unsigned char binary_pattern[] =
    {0x3F,0x06,0x5B,0x4F,0x66,0x6D,0x7D,0x07,0x7F,0x6F};
void main(void) {
    TRISD = 0x00; //define PORTD as a output pin
    while(1)    {
        for (int i=0;i<10;i++)    {
            PORTD = binary_pattern[i];
            msdelay(1000); //add delay
        }
    }
    return;
}
```



Projects



led\_test - Dashboard

led\_test - Output

Files

Start Page



Microchip Login

Already Registered?

timer1

Notifications

MPLAB IDE

Thank you..



- Unsigned char a=00,b;
- For(a =0; a<=0xFF; a++)
- b= a & 0x0F;
- PORTBbits.RB0 = 1;
- PORTBbits.RB1 = 0;
- PORTD= **binary\_pattern[b];**
- b = a & 0xF0;
- b = b>>4;
- PORTBbits.RB1 = 1;
- PORTBbits.RB0 = 0;
- PORTD= **binary\_pattern[b];**