EXPT. NO. : 5

TITLE: Interfacing push buttons, Led's, Relay and Buzzer to PIC microcontroller

```
//Includes
#include <p18f4550.h>          //Include Controller specific .h
#include "vector_relocate.h"    //Vector Remapping for USB HID Bootloader

//Declarations
#define lrbit   PORTBbits.RB1   //SW0 interfaced to RB1
#define rlbit   PORTBbits.RB0   //SW1 interfaced to RB0
#define buzzer  PORTCbits.RC2   //Buzzer interfaced to RC2
#define relay   PORTDbits.RD7   //Relay interfaced to RC1

//Function Prototypes
void msdelay (unsigned int time);//Function for delay

//Start of Program Code
void main()                 //Main Program
{
   unsigned char i,val=0;      //Variable to latch the switch condition
   INTCON2bits.RBPU=0;         //To Activate the internal pull on PORTB
   ADCON1 = 0x0F;              //To disable the all analog inputs

   TRISBbits.RB0=1;        //To configure RB0 as input for sensing SW1
   TRISBbits.RB1=1;        //To configure RB1 as input for sensing SW0

   TRISDbits.TRISD7=0;         //To configure RC1 (relay) as output
   TRISCbits.TRISC2=0;         //To configure RC2 (buzzer) as output
   TRISA = 0x00;               //To configure PORTD (LED) as output

   PORTA = 0x00;               //Initial Value for LED
   buzzer = 0;                 //Initial Value for Buzzer
   relay = 0;                  //Initial Value for Relay

while (1)                   //While loop for repeated operation
   {
   if (lrbit==0)               //To check whether SW0 is pressed
```

```
    val = 1;              // Latch the status of switch SW0
  if (rlbit==0)            //To check whether SW1 is pressed
    val = 2;              // Latch the status of switch SW1

  if (val == 1)
    {
    buzzer = 1;
    relay = 1;
    // 7led
    // 0001 0000
    PORTA = 0x20;
    msdelay(50);
    for(i=0;i<8;i++)
    {
      PORTA = PORTA >>1; //Shift left by 1 bit
      msdelay(50); // Make the MSB bit equal to 1
    }

    }
  if (val == 2)
    {
    buzzer = 0;
    relay = 0;
    PORTA = 0x01;

    // 0000 0001
     msdelay(50);
    for(i=0;i<8;i++)
    {
      PORTA = PORTA <<1; //Shift left by 1 bit
      msdelay(50); // Make the MSB bit equal to 1
    }
    }
  }
}
//End of the Program

//Function Definitions
void msdelay (unsigned int time)//Function for delay
```

```
{
unsigned int i, j;
 for (i = 0; i < time; i++)
    for (j = 0; j < 710; j++); //Calibrated for a 1 ms delay in MPLAB
}
```