T62 Tutorial 8

PORTS B and D are connected to the 4 x 7-segment LED.

Write a program to perform the following tasks:

1. Display “0”, “1”, “2”, “3” on the first 7-segment LED
2. Repeat some times
3. Display “4”, “5”, “6”, “7” on the second 7-segment LED
4. Repeat some times
5. Display “8”, “9”, “A”, “b” on the third 7-segment LED
6. Repeat some times
7. Display “C”, “d”, “E”, “F” on the fourth 7-segment LED
8. Repeat some times
9. Goto 1

Store the 7-segment LED decoder table in a look-up table. Your program must use table processing. Copy the program from the editor window.

(12 marks)

```
        LIST    P=18F4520
        #include <P18F4520.INC>
                CONFIG      OSC = XT
                CONFIG      WDT = OFF
                CONFIG      LVP = OFF
                CBLOCK      0x000
                        DELAY_U
                        DELAY_H
                        DELAY_L
                        input
                ENDC
                count   EQU     0x10
                cntval  EQU     0x03

        ORG     0x0000
                goto    Main
        ORG 0x0030
Main:           movlw 0x0f
                movwf ADCON1
                clrf    TRISD
                clrf    PORTD
                clrf    TRISB
                clrf    PORTB
Loop:
                        movlw       cntval
                        movwf       count
P_1:                    movlw       0x00
                        movwf       PORTB
                        movlw       d'0'
                        movwf       input
                        call    dec_7seg
                        movwf       PORTD
                        call    Delay
```

```
        movlw   d'1'
        movwf   input
        call    dec_7seg
        movwf   PORTD
        call    Delay
        movlw   d'2'
        movwf   input
        call    dec_7seg
        movwf   PORTD
        call    Delay
        movlw   d'3'
        movwf   input
        call    dec_7seg
        movwf   PORTD
        call    Delay
        decf    count,f
        bnz     P_1

        movlw   cntval
        movwf   count
P_2:    movlw   0x01
        movwf   PORTB
        movlw   d'4'
        movwf   input
        call    dec_7seg
        movwf   PORTD
        call    Delay
        movlw   d'5'
        movwf   input
        call    dec_7seg
        movwf   PORTD
        call    Delay
        movlw   d'6'
        movwf   input
        call    dec_7seg
        movwf   PORTD
        call    Delay
        movlw   d'7'
        movwf   input
        call    dec_7seg
        movwf   PORTD
        call    Delay
        decf    count,f
        bnz     P_2

        movlw   cntval
        movwf   count
P_3:    movlw   0x02
        movwf   PORTB
        movlw   d'8'
        movwf   input
```

```
                call    dec_7seg
                movwf   PORTD
                call    Delay
                movlw   d'9'
                movwf   input
                call    dec_7seg
                movwf   PORTD
                call    Delay
                movlw   d'10'
                movwf   input
                call    dec_7seg
                movwf   PORTD
                call    Delay
                movlw   d'11'
                movwf   input
                call    dec_7seg
                movwf   PORTD
                call    Delay
                decf    count,f
                bnz     P_3

                movlw   cntval
                movwf   count
P_4:            movlw   0x03
                movwf   PORTB
                movlw   d'12'
                movwf   input
                call    dec_7seg
                movwf   PORTD
                call    Delay
                movlw   d'13'
                movwf   input
                call    dec_7seg
                movwf   PORTD
                call    Delay
                movlw   d'14'
                movwf   input
                call    dec_7seg
                movwf   PORTD
                call    Delay
                movlw   d'15'
                movwf   input
                call    dec_7seg
                movwf   PORTD
                call    Delay
                decf    count,f
                bnz     P_4
                goto    Loop

dec_7seg:       movlw low led_table
                movwf TBLPTRL
```

```
                movlw high led_table
                movwf TBLPTRH
                movlw upper led_table
                movwf TBLPTRU
                movf    input,W
                addwf  TBLPTRL,F
                movlw 0
                addwfcTBLPTRH
                addwfcTBLPTRU
                tblrd*
                movf    TABLAT,W
                return
led_table
db
0x3F,0x06,0x5B,0x4F,0x66,0x6D,0x7D,0x07,0x7F,0x6F,0x77,0x7c,0x39,0x5e,0x79,0x71

Delay:          MOVLW       0x07
                MOVWF       DELAY_U
LOP_1:          MOVLW       0xff
                MOVWF       DELAY_H
LOP_2:          MOVLW       0xff
                MOVWF       DELAY_L
LOP_3:          DECF  DELAY_L, F
                BNZ             LOP_3
                DECF  DELAY_H, F
                BNZ             LOP_2
                DECF  DELAY_U, F
                BNZ             LOP_1
                return

                END
```

0 mark if not using table processing