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;*****************************************
;**** lab4 switch debounce ***************
;*****************************************

        PROCESSOR PIC16F628
        #include <P16F628.INC>
        __CONFIG    _CP_OFF & _MCLRE_OFF & _INTRC_OSC_NOCLKOUT & _LVP_OFF &
        _WDT_OFF

;****** Define general purpose registers for temporary variables
        cblock  0x20
            temp
            temp1
            count
            count0
            count1
            count2
        endc
;************************************************************
        ORG     0x00        ; Reset Vector
        goto    main        ; vector to main program

main:
        call    init        ; calling initialization subroutine

L1:
        btfsc   PORTA,1
        goto    L2

        movlw   .10
        call    DelayMS

        btfsc   PORTA,1
        goto    L2

        bsf     PORTB,1

L2:
        btfsc   PORTA,0     ; Check if the switch is pressed?
        goto    L3          ; No the switch is not pressed

        movlw   .10         ; Yes the switch is pressed then delay for 10mS
        call    DelayMS     ; by calling the time delay subroutine

        btfsc   PORTA,0     ; Check again if the switch is still pressed?
        goto    L3          ; No then go back to check the switch again

        bsf     PORTB,0     ; Yes the switch is still pressed
                            ; then turn on the LED

L3:
        btfss   PORTA,0     ; Check if switch is released?
        goto    L4          ; No the switch is still pressed

        bcf     PORTB,0     ; Yes the switch is released
                            ; then turn off the LED

L4:
        btfss   PORTA,1
        goto    L1

        bcf     PORTB,1
        goto    L1          ; Go back and repeat the loop again

;************* Subroutine ******************

init:
        movlw   .7
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68          banksel CMCON
69          movwf   CMCON       ; disable analog comparator
70          banksel TRISB
71          movlw   0x00
72          movwf   TRISB       ; PORTB is output port
73          movlw   0xFF
74          movwf   TRISA       ; PORTA is input port
75          banksel PORTB
76          clrf    PORTB
77          return
78
79  DelayMS:
80          movwf   count2
81          incf    count2,f
82          decfsz  count2,f
83          goto    $+2
84          goto    $+3
85          call    Delay1MS
86          goto    $-4
87          return
88
89  Delay1MS:
90          movlw   .50         ; 1 cyc
91          movwf   count1      ; 1 cyc
92  outterloop:
93          movlw   .5          ; 1 cyc * count1
94          nop                 ; 1 cyc * count1
95          movwf   count0      ; 1 cyc * count1
96  innerloop:
97          decfsz  count0,F    ; 1 cyc * count1 * count0
98          goto    innerloop   ; 2 cyc * count1 * count0
99          decfsz  count1,F    ; 1 cyc * count1
100         goto    outterloop  ; 2 cyc * count1
101         return              ; 1 cyc
102         ; total = 3 + (6+3.count0).count1
103         ; count0 = 5 , count1 = 50, total = 1053 cyc ??
104
105         END
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