

# main.asm

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1  LIST P=18F4520
2  #INCLUDE <P18F4520.INC>
3  CONFIG OSC=HS
4  CONFIG MCLRE = OFF
5
6  CBLOCK 0X00
7  CHUC
8  DONVI
9  DEM1
10 DEM2
11 DEMLAN1
12 ENABLE
13 ENABLE1
14 START
15 W_TEMP
16 STATUS_TEMP
17  ENDC
18
19  ORG 0X00
20  GOTO MAIN
21  ORG 0X08
22  GOTO NGAT
23 MAIN
24  CLRF TRISD ;CAU HINH PORTD LA OUTPUT
25  CLRF TRISC ;CAU HINH PORTC LA OUTPUT
26  CLRF TRISA ;CAU HINH PORTA LA OUTPUT
27  MOVLW 0X07
28  MOVWF TRISB ;CAU HINH RB<2:0> LA OUTPUT
29  MOVLW 0X0F
30  MOVWF ADCON1 ;CAU HINH AN<12:0> LA Digital I/O
31  MOVLW 0X07
32  MOVWF CMCON ;CAU HINH COMPARATORS LA DIGITAL INPUT
33  BSF INTCON,7 ;CHO PHEP DUNG NGAT
34  BSF INTCON,4 ;CHO PHEP DUNG NGAT NGOAI INTO
35  BCF INTCON,2,7 ;Treo PORT B LEN DUONG
36  BCF INTCON,2,6 ;NGAT O SUON XUONG
37  BSF INTCON,3,3 ;CHO PHEP DUNG NGAT NGOAI INT1
38  BSF INTCON,3,4 ;CHO PHEP DUNG NGAT NGOAI INT2
39  BSF TOCON,7 ;CHO PHEP TIMER0 HOAT DONG
40  BCF TOCON,6 ;SU DUNG BO DEM 16-BIT
41  BCF TOCON,5 ;SU DUNG NGUON DAO DONG BEN NGOAI
42  BCF TOCON,3 ;CHO PHEP GAN TY LE CHIA VO TIMER
43  BSF TOCON,2 ;CHON GIA TRI Prescale value (TY LE CHIA)LA 1:32
44  BCF TOCON,1
45  BCF TOCON,0
46  CLRF START ;KHOI TAO START LA 0X00
47  SETF ENABLE ;KHOI TAO START LA 0XFF
48  CLRF CHUC ;KHOI TAO START LA 0X00
49  CLRF DONVI ;KHOI TAO START LA 0X00
50  CLRF ENABLE1 ;KHOI TAO ENABLE1 LA 0X00
51
52 LOOP ;CHO NGAT
53  MOVLW 0XFF
54  CPFSEQ START
55  GOTO LOOP
56
57 LOOP1 ;BAT/TAT RELAY
58  MOVLW 0X00
59  CPFSEQ ENABLE1 ;KIEM TRA NEU DA NHAN OFF THI KHONG SANG LED 7 DOAN
60  GOTO LOOP2
61  MOVLW D'0'
62  CPFSEQ DEMLAN1 ;TAO TRE CHO DEN SANG
63  GOTO DEMTHUI
64  BCF PORTD,3

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65
66 LOOP2 ;SANG LED 7 DOAN, DEN CANH BAO
67 CALL HIEN THI
68 CALL SANGDEN
69 GOTO LOOP1
70
71 DEMTHU1 ;TAO TRE CHO RELAY
72 DECF DEMLAN1,1
73 GOTO BATDEN
74
75 BATDEN ;BAT DEN(RELAY)
76 BSF PORTD,3
77 GOTO LOOP2
78
79 HIEN THI ;HIEN THI LED 7 DOAN
80 MOVLW 0XFF
81 CPFSEQ START ;KIEM TRA NEU KHONG NHAN OFF THI BO QUA CT RESET
82 GOTO START1
83 MOVF DONVI,0
84 CALL MANGMA
85 MOVWF DEM1
86 MOVF CHUC,0
87 CALL MANGMA
88 MOVWF DEM2
89 MOVLW 0X01
90 MOVWF PORTA
91 MOVF DEM1,0
92 MOVWF PORTC
93 CALL DELAY
94 MOVLW 0X02
95 MOVWF PORTA
96 MOVF DEM2,0
97 MOVWF PORTC
98 CALL DELAY
99 RETURN
100
101 MANGMA ;MANG MA LED 7 DOAN TU 0 -> 9
102 ADDWF PCL,1
103 DT 0xC0, 0xF9, 0xA4, 0xB0, 0x99, 0x92, 0x82, 0xF8, 0x80, 0x90
104
105 START1 ;XOA BO NHO KHI OFF
106 CLRF CHUC
107 CLRF DONVI
108 CLRF PORTA
109 BCF PORTD,0
110 BCF PORTD,1
111 BCF PORTD,2
112 RETURN
113
114 DELAY ;TAO TRE HIEN THI LED 7 DOAN
115 MOVLW 0XF9
116 MOVWF TMR0H
117 MOVLW 0XE5
118 MOVWF TMR0L
119 BTFSS INTCON,2
120 GOTO $-2
121 BCF INTCON,2
122 RETURN
123
124 NGAT ;CT NGAT
125 BTFSC INTCON,1
126 GOTO NGAT_RB0 ;NGAT INTO
127 BTFSC INTCON3,0
128 GOTO NGAT_RB1 ;NGAT INT1
129 BTFSC INTCON3,1
130 GOTO NGAT_RB2 ;NGAT INT2

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131  RETFIE
132
133  NGAT_RB1  ;NGAT INT1
134  COMF START
135  MOVLW 0xFF
136  CPFSEQ START
137  GOTO RB1_OFF
138  BCF INTCON3,0
139  RETFIE
140
141  RB1_OFF ;NGAT INT1 KHI OFF
142  BCF PORTD,3
143  SETF ENABLE
144  CLRF ENABLE1
145  BCF INTCON3,0
146  RETFIE
147
148  NGAT_RB2 ;NGAT INT2
149  COMF ENABLE
150  COMF ENABLE1
151  BSF PORTD,3
152  BCF INTCON3,1
153  RETFIE
154
155  NGAT_RB0  ;NGAT INT0
156  MOVWF W_TEMP
157  MOVFF STATUS_TEMP,STATUS_TEMP
158  MOVLW 0xFF
159  CPFSEQ START
160  GOTO THOAT1
161  CPFSEQ ENABLE
162  GOTO THOAT
163  MOVLW D'18'
164  CPFSEQ CHUC
165  GOTO CAP_NHAT
166  CPFSEQ DONVI
167  GOTO CAP_NHAT
168  GOTO THOAT
169
170  CAP_NHAT  ;TANG CHUC,DONVI DE HIEN THI SO DEM TIEP THEO
171  INCF DONVI
172  INCF DONVI
173  MOVF DONVI,0
174  XORLW D'20'
175  BTFSS STATUS,Z
176  GOTO THOAT
177  CLRF DONVI
178  INCF CHUC
179  INCF CHUC
180  MOVF CHUC,0
181  XORLW D'20'
182  BTFSS STATUS,Z
183  GOTO THOAT
184
185  THOAT  SANG DEN VA TAO TRE
186  CALL SANGDEN
187  BSF PORTD,3
188  MOVLW D'50'
189  MOVWF DEMLAN1
190
191  THOAT1  ;KHOI PHUC THANH GHI WREG VA STATUS REG
192  MOVF W_TEMP,0
193  MOVFF STATUS_TEMP,STATUS
194  BCF INTCON,1
195  RETFIE
196

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```
197 SANGDEN ;SANG DEN CANH BAO
198 BCF STATUS,C
199 MOVLW D'2'
200 SUBWF CHUC,0
201 BTFSS STATUS,C
202 GOTO SANG0 ;0<CHUC<10
203 BCF STATUS,C
204 MOVLW D'4'
205 SUBWF CHUC,0
206 BTFSS STATUS,C
207 GOTO SANG1 ;10<CHUC<20
208 BCF STATUS,C
209 MOVLW D'6'
210 SUBWF CHUC,0
211 BTFSS STATUS,C
212 GOTO SANG2 ;30<CHUC<40
213 BCF STATUS,C
214 MOVLW D'8'
215 SUBWF CHUC,0
216 BTFSS STATUS,C
217 GOTO SANG3 ;40<CHUC<99
218 RETURN
219
220 SANG0
221 BCF PORTD,0
222 BCF PORTD,1
223 BCF PORTD,2
224 RETURN
225
226 SANG1
227 BSF PORTD,0
228 BCF PORTD,1
229 BCF PORTD,2
230 RETURN
231
232 SANG2
233 BCF PORTD,0
234 BSF PORTD,1
235 BCF PORTD,2
236 RETURN
237
238 SANG3
239 BCF PORTD,0
240 BCF PORTD,1
241 BSF PORTD,2
242 RETURN
243
244 END
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