EECE416: Microcomputer Fundamentals and Design

source: www.mwftr.com

PIC Coding Practice -B

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FAIRCHILD
SEMICONDUCTOR™

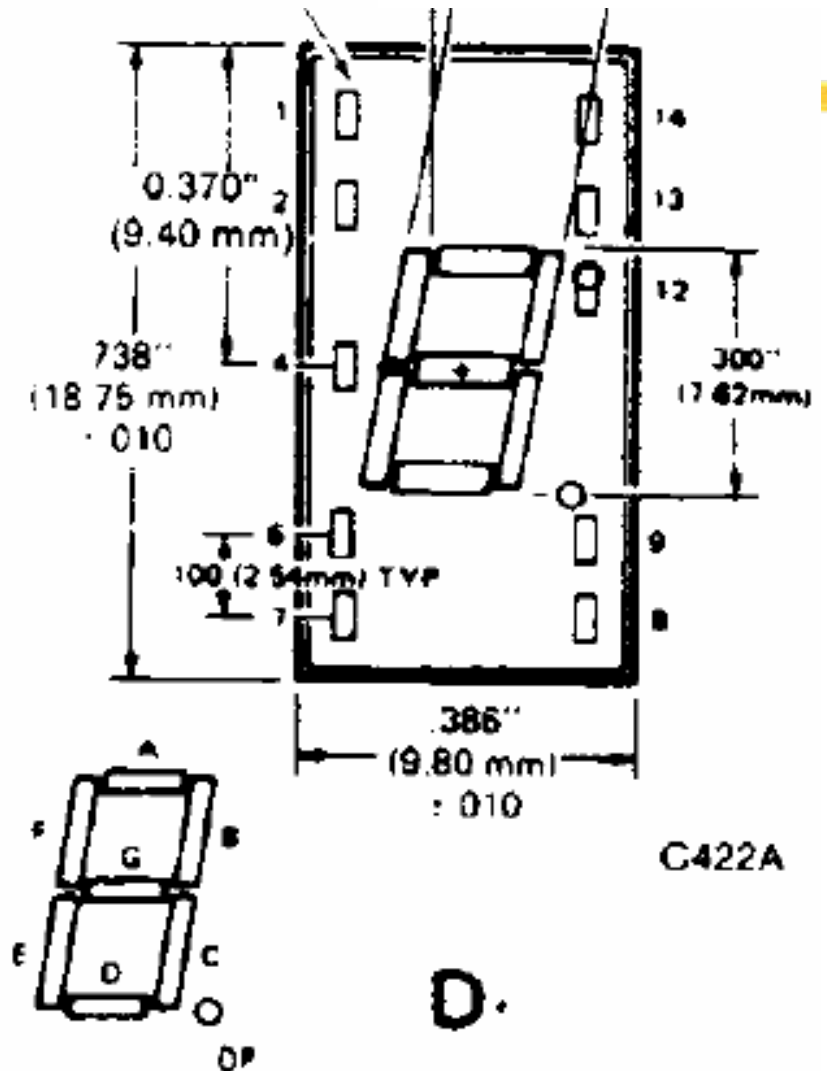HIGH EFFICIENCY GREEN **MAN3400**
ORANGE **MAN3600**

⌘ MAN74A

⌵ Common Cathode

⌵ +5V

⌵ 25mA

0.370"
(9.40 mm)

738"
(18 75 mm)
· 010

.100 (2 54 mm) TYP

300"
(7 62mm)

.386"
(9.80 mm)
: 010

C422A

A
F G B
E D C
O
OP

D.
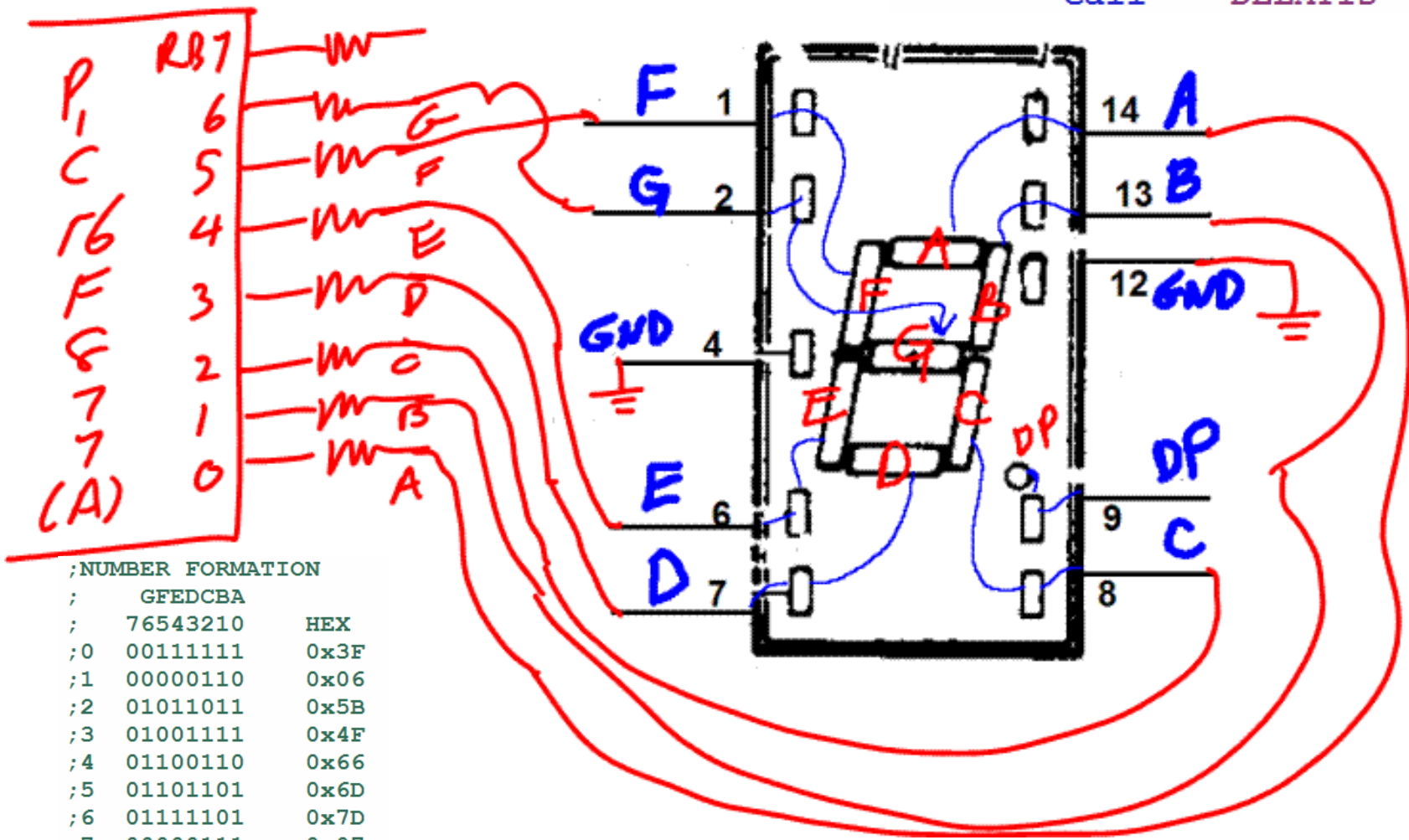
```
movlw    0x3F
movwf    PORTB
call     BZZZ
call     DELAY1s
```

R = 200Ω

```
;NUMBER FORMATION
;     GFEDCBA
;     76543210    HEX
;0    00111111    0x3F
;1    00000110    0x06
;2    01011011    0x5B
;3    01001111    0x4F
;4    01100110    0x66
;5    01101101    0x6D
;6    01111101    0x7D
;7    00000111    0x07
;8    01111111    0x7F
;9    01100111    0x67
```

First 7-Segment LED code

⌘ Start from 0

⌘ Increase the number by 1 every 1 second

⌘ Cyclic: 0 →1→2→ ….→9 →0 →1 ….

⌘ Beep (or Buzz) when the number is changed.

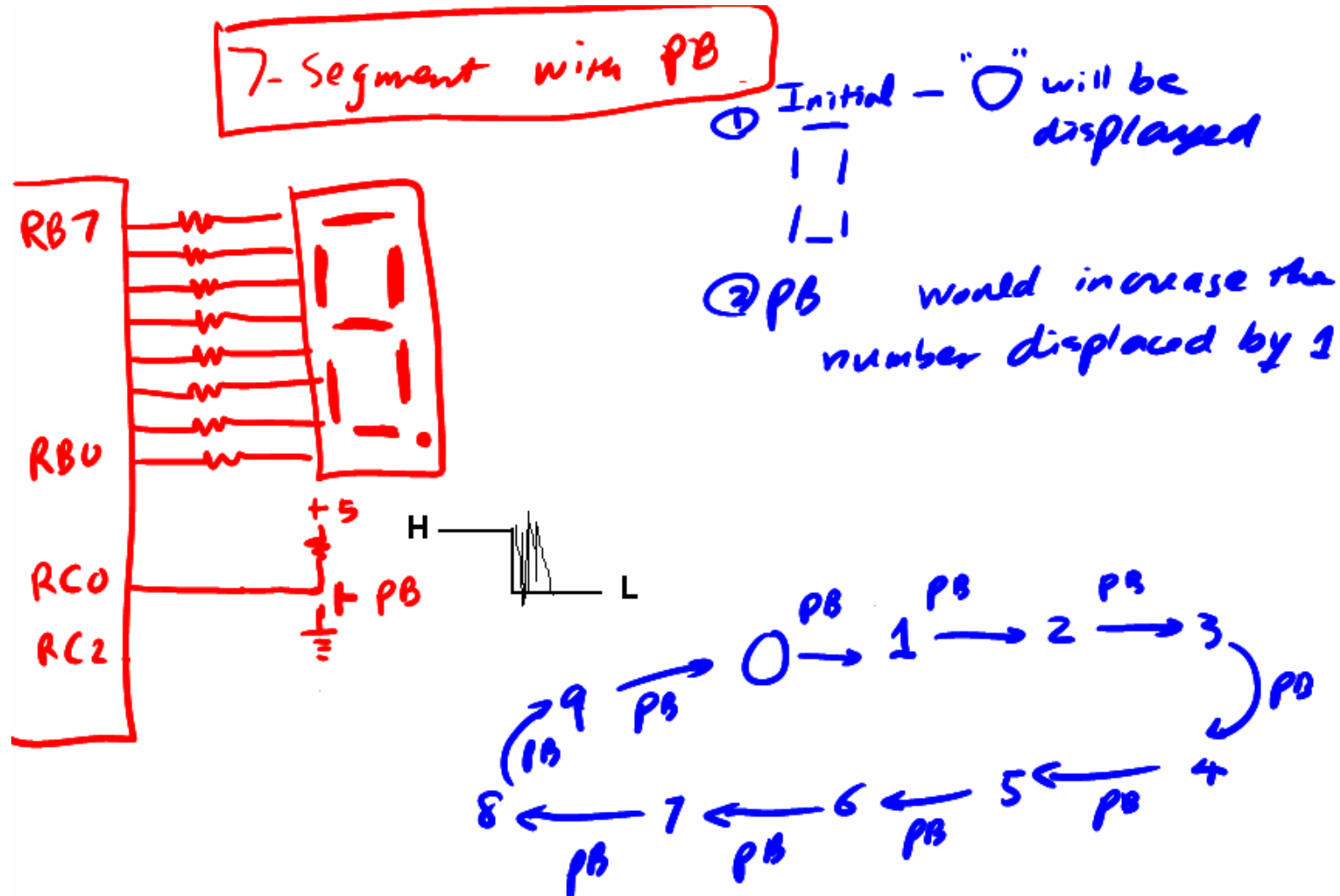⌘ Save file as "7LED_1.ASM"

⌘Regular Approach   vs.   Table Approach

```
movlw    0x00
movwf    PORTB
call     BZZZ
call     DELAY1s
goto     LOOP
movlw    0x5B
movwf    PORTB
call     BZZZ
call     DELAY1s
movlw    0x4F
movwf    PORTB
call     BZZZ
call     DELAY1s
movlw    0x66
movwf    PORTB
call     BZZZ
call     DELAY1s
movlw    0x6D
movwf    PORTB
call     BZZZ
call     DELAY1s
movlw    0x7D
movwf    PORTB
call     BZZZ
call     DELAY1s
movlw    0x07
```

```
AGAIN    MOVLW    0x00
         CALL     TABLE
         MOVWF    PORTB
         CALL     DELAY1S
         MOVLW    0x01
         CALL     TABLE
         MOVWF    PORTB
         CALL     DELAY1S


TABLE    ADDWF    PCL
;PC=PC+[W]=${TABLE+[W]}
         RETLW    0x0F     ;0
         RETLW    0x06     ;1
         RETLW    0x5B     ;2
         :
         :
         :
         RETLW    0x67     ;9
```
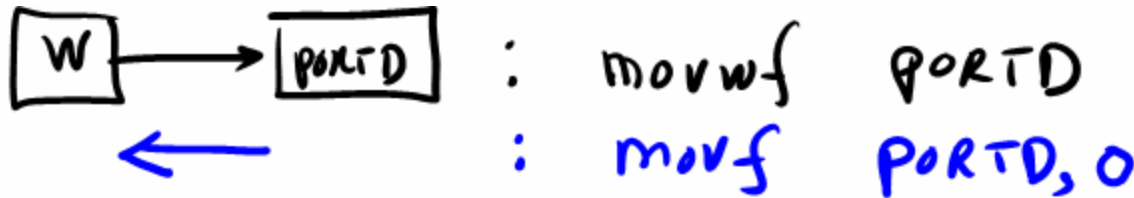
7-Segment with PB

① Initial – "0" will be displayed

② PB would increase the number displayed by 1

RB7
RB0
RC0
RC2

+5
PB
H
L

$0 \xrightarrow{PB} 1 \xrightarrow{PB} 2 \xrightarrow{PB} 3$

$9 \xrightarrow{PB}$ (10)

$8 \xleftarrow{PB} 7 \xleftarrow{PB} 6 \xleftarrow{PB} 5 \xleftarrow{PB} 4$ PB

⌘Save file as "7LED_PB.ASM"

W ⟶ PORTD : movwf PORTD
⟵   : movf   PORTD, 0

MOVF

INCREAMENT CASE:

W ⟶ TEMP ⟵ ··· NOT I/o, but Temporary storage at RAM

PB
NO   YES

TEMP+1 ⟶ W

TABLE ⟶ DISP

"incf TEMP"

movf TEMP, 0

done only by f (Memory)

controlled/engaged by W

check for
"10" ⟹ "0"
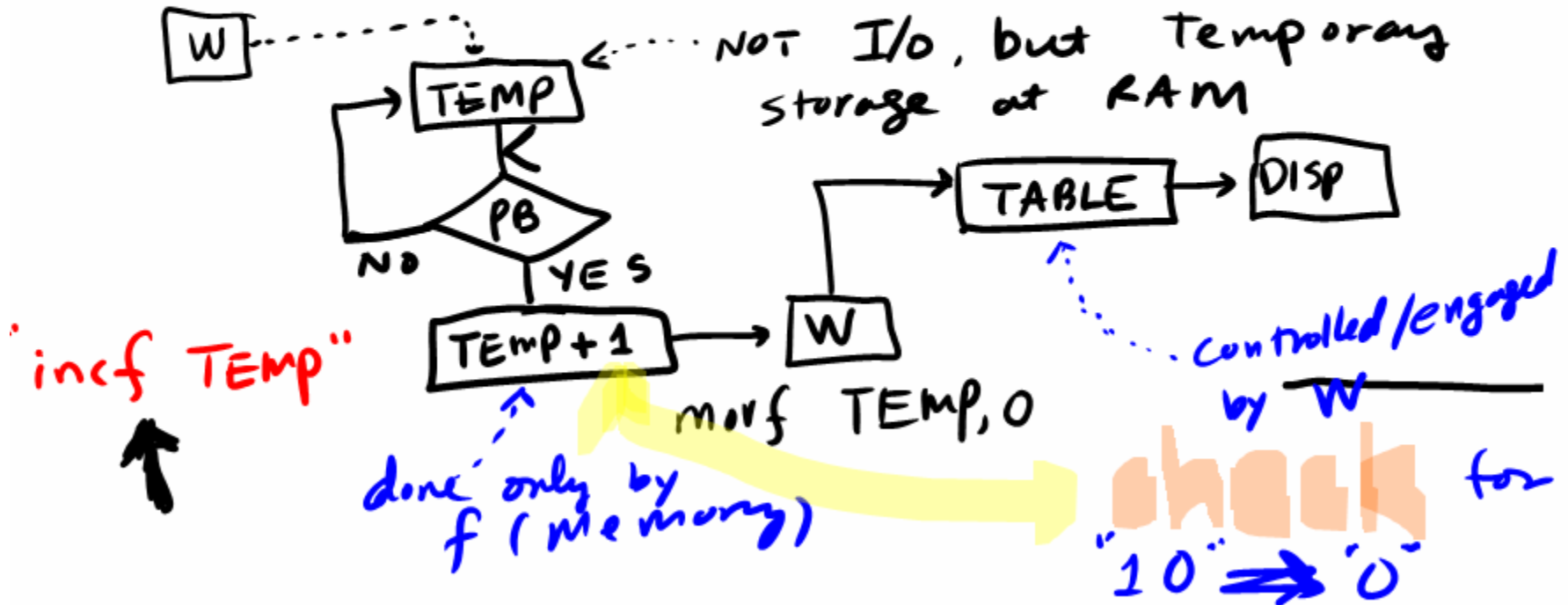
⌘ Usual Approach

```
START
                BANKSEL TRISB
                movlw   0x00    ;ALL OUTPUT
                movwf   TRISB
                movwf   TRISD
                movlw   0xFF    ;ALL IN
                movwf   TRISC
                BANKSEL PORTB
                clrf    PORTB
;Start with 0
ZEROP           movlw   0x3F    ;display 0
                movwf   PORTB
                call    BZZZ
                call    DELAY1s
ONEP            btfsc   PORTC, PBUP
                goto    ONEP
                movlw   0x06    ;display 1
                movwf   PORTB
                call    BZZZ
                call    DELAY1s
TWOP            btfsc   PORTC, PBUP
                goto    TWOP
                movlw   0x5B
                movwf   PORTB
                call    BZZZ
                call    DELAY1s
TRIP            btfsc   PORTC, PBUP
                goto    TRIP
                movlw   0x4F
                movwf   PORTB
                call    BZZZ
                call    DELAY1s
```