16.317: Microprocessor Systems Design I

Spring 2012

Lecture 33: Key Questions
April 23, 2012

1. Describe the instructions used for conditional execution on the PIC 16F684.

2. **Example:** Show the values of all changed registers after each of the following sequences. What high-level operation does each perform?

a.
```
    movf    a, W
    sublw   0xA
    btfsc   STATUS, Z
    goto    L1
    incf    b, W
    goto    L2
L1
    decf    b, W
L2
    movwf   a
```

b.
```
    movf    NUM2, W
    subwf   NUM1, W
    btfss   STATUS, C
    goto    BL
    movf    NUM1, W
    goto    Done
BL
    movf    NUM2, W
Done
    movwf   MAX
```

3. Show an example of how the conditional bit test instructions can be used to decrement a 16-bit variable.

4. Show an example of how the conditional bit test instructions can be used to test a 16-bit variable to see if it is zero.

5. Describe the operation of the given subroutine, which implements a 10 ms delay loop.

```
;*****************************************************************
; TenMs subroutine and its call inserts a delay of exactly ten milliseconds
; into the execution of code.
; It assumes a 4 MHz crystal clock. One instruction cycle = 4 * Tosc.
; TenMsH    equ  13       ; Initial value of TenMs Subroutine's counter
; TenMsL    equ  250
; COUNTH and COUNTL are two variables
TenMs
        nop                     ; one cycle
        movlw     TenMsH        ; Initialize COUNT
        movwf     COUNTH
        movlw     TenMsL
        movwf     COUNTL
Ten_1
        decfsz    COUNTL,F      ; Inner loop
        goto      Ten_1
        decfsz    COUNTH,F      ; Outer loop
        goto      Ten_1
        return
```