

CSCI 255 – Intro to Embedded Systems
Homework #12
Fall 2013

Work must be done individually

Due: **11/20/2013** by **11:59PM** to dvalles@mtech.edu

Part 1 - Translate the following assembly to C-equivalent code. Make sure you have a main function and header file in all translations.

1.

```
        ; assume initializations here

mov.b  #1,R4
One:
mov.b  #12,R5
Two:
mov.b  #255,R6
Three:
dec.b  R6
jnz    #Three
dec.b  R5
jnz    #Two
dec.b  R4
jnz    #One
```

2.

```
        ; assume initializations here

START:
mov.b  #13,R4
call   #Display
Loop:
nop
jmp    Loop
Display:
mov.b  R4,R5
inv.b  R5
mov.b  R5,&P1OUT
ret

.end
```

3.

; assume initializations here

```
SMCLK      .equ    1200000
WDT_CTL    .equ    WDT_MDLY_8
WDT_CPS    .equ    SMCLK/4000

            mov.w   #WDT_CTL,WDTCTL
            mov.w   #WDT_CPS,R4
            bis.b   #WDTIE,IE1
            mov.b   #0xFF,&P1DIR
            mov.b   #0x00,&P1OUT
            bis.w   #GIE|LPM0,SR

loop:       jmp     loop

WDT_ISR:    dec.w   R4
            jne     here
            xor.b   #0xFF,&P1OUT
here:       reti
```

Part 2 - Write a C-program that uses the WatchDog Timer in which for every 3 second lapse:

- **The LEDs (P1.0 to P1.7) scroll left, starting from P1.0, once every 0.25 seconds**
- **When scroll reaches P1.7, it starts scrolling right moving every 0.25 seconds**
- **When scroll reaches P1.0, all LEDs flash twice**
- **After flash, program waits for another 3 second lapse**
- **This part of the Homework will be graded with the MSP430 board**