## 1)

#### a)

;-------------------------------------------------------------------------------

; Main loop here

;-------------------------------------------------------------------------------

call #cfg

main: nop

jmp main

;-------------------------------------------------------------------------------

; Subroutine: cfg

; input: R10 = strictly positive integer n > 0

; output: R12 = sum of all positive integers less than and equal to n

;

; Free to modify R10 and R12 but no other core register

;

;-------------------------------------------------------------------------------

cfg:

clr R12

loop:

add.b R10, R12

dec R10

jnz loop

ret

#### b)

255 is the largest signed integer this method can handle correctly, since the result in R12 will be 32640.

## 2)

#### a)

V = 1

#### b)

N = 1

#### c)

C = 0

#### d)

V will be 1 because the 8 bit addition in the second step will cause an overflow

N will be 1 because we are adding two positive numbers and will receive a negative

C will be 0 because we will not carry out an arithmetic operation which uses a carry

## 3)

#### a)

Line 291

#### b)

cmp.w R5, R8

#### c)

x (R5) = 3

N (R8) = 8

## 4)

R5 (3) is pushed to the stack for safe keeping

R6 (11) is binary shifted left once and becomes 22

R5 is decremented and becomes 2

R6 is binary shifted left once and becomes 44

R5 is decremented and becomes 1

R6 is binary shifted left once and becomes 88

R5 is decremented and becomes 0

3 is popped from the stack and is assigned to R5

Subroutine ends and PC returns to wherever it was before subroutine was called

R5 = 3

R6 = 88

## 5)

Button S1.1 is pushed

bit at P1.1 is checked and returns that it equals 1

bit at P1.1 is cleared

PC returns to wherever it was before button was pushed

## 6)

I don’t think there was one “thing” that I most appreciated, rather I thoroughly enjoyed the concepts associated with low level programming like what we did all semester. I’d been looking forward to learning assembly languages since I was an eager little highschooler, and I’m very glad that I was finally able to do that with you. Thank you for a great semester, this was certainly my favorite class of college so far!