Lab1 Report

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;*---------------------------------------------------------------------------
;* Name:    Lab_1_program.s
;* Purpose: This code flashes one LED at approximately 1 Hz frequency
;* Author:         Rasoul Keshavarzi
;*---------------------------------------------------------------------------*/
        THUMB           ; Declare THUMB instruction set
        AREA            My_code, CODE, READONLY      ;
        EXPORT          __MAIN                  ; Label __MAIN is used externally q
        ENTRY
__MAIN
; The following operations can be done in simpler methods. They are done in this
; way to practice different memory addressing methods.
; MOV moves into the lower word (16 bits) and clears the upper word
; MOVT moves into the upper word
; show several ways to create an address using a fixed offset and register as offset
;   and several examples are used below
; NOTE MOV can move ANY 16-bit, and only SOME >16-bit, constants into a register
; BNE and BEQ can be used to branch on the last operation being Not Equal or EQual to zero
;
        MOV             R2, #0xC000             ; move 0xC000 into R2
        MOV             R4, #0x0                ; init R4 register to 0 to build address
        MOVT            R4, #0x2009             ; assign 0x20090000 into R4
        ADD             R4, R4, R2              ; add 0xC000 to R4 to get 0x2009C000

        MOV             R3, #0x0000007C         ; move initial value for port P2 into R3
        STR             R3, [R4, #0x40]  ; Turn off five LEDs on port 2
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        MOV             R3, #0xB0000000         ; move initial value for port P1 into R3
        STR             R3, [R4, #0x20]  ; Turn off three LEDs on Port 1 using an offset

        MOV             R2, #0x20               ; put Port 1 offset into R2 for user later

        MOV             R0, #0x0000             ; Initialize R0 lower word for countdown

        MOVT    R0, #0x0010     ; Initialize R0 higher word for countdown

loop

        SUBS            R0, #1                  ; Decrement r0 and set the N,Z,C status bits

        BNE     loop        ; when R0 is not equal to 0, the loop will contunie; when R0 is equal to 0,
the program will go out of the loop to the next step

        MOV     R0, #0X0000     ; reset R0 lower word for countdown

        MOVT    R0, #0x0010     ;reset R0 higher word for countdown

        STR     R3, [R4, R2]    ; write R3 port 1, YOU NEED to toggle bit 28 first

        EOR     R3, R3, #0x10000000   ; using xor to turn "off" and "on" the light on port 1.28. toggling
between 0xA0000000 and 0xB0000000

        B                       loop            ;       it makes the light toggling forever!

        END
```

;Hand assembly: ADD R4, R4, R2 1110 00 0 0100 0 0100 0100 00000000 0010

;Slice into 4 bit pieces and convert to hex gives: 0xE0844002

Lab-1 Submission form

Class:	001 ☑	201 □	202 ☑	203 □	Demo date:
	002 □	204 □	205 □	206 □	Sep. 30/2016

Submission Statement: We (I) are (am) submitting this report for grading in ECE 222. We (I) certify that this report (including any code, descriptions, flowcharts, etc., that are part of the submission) were written by us (me) and have received no prior academic credit at this university or any other institution. **The penalty for copying or plagiarism will be a grade of zero (0).**

Member 1	Member 2
Name: Zaoli Zhang	Name: Tiancheng Cao
UW-ID (**NOT** student #) z376zhan	UW-ID (**NOT** student #) t35gao
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		Weight	Grade	Comment
Part-I	Pre-lab	0	--	
Part-II Lab-demo	Lab completion (short flowchart)	35	35	
	Questions	35	35 | 35	
Part-III Lab report	Hand Assembly	10		
	Code quality	10		
	Code comments	10		
	Total	**100**		