

Homework 8

1. For the following C code, implement this in ARM assembly.

```
for (loop = delay; loop > 0; loop--){
    dummy = 0; // dummy is volatile
}

    movw  r3, #XXXX
    movt  r3, #XXXX // whatever delay is
    movw  r2, #YYYY
    movt  r2, #YYYY // memory address for dummy
    movw  r1, #0
L0
    str   r1, [r2] // write 0 to dummy
    subs  r3, #1
    bne   L0
```

2. What is the purpose of *static* in C code?

To have a variable maintain its value after the function finishes. Therefore, it is allocated on the heap.

3. What is the purpose of *volatile* in C code?

It prevents the compiler from optimizing code away, and therefore allows memory mapped I/O or interrupts to occur and still not incorrectly implement code.

4. What is the type of function that does not have a return value? Take a look at lab 3 main.c. What is the declaration of our EINT0 interrupt handler?

```
void EINT0_IRQHandler (void);
```

5. For lab 3, there is a branch instruction that takes us to the EINT0 interrupt handler. What is the address of this branch instruction? What piece of hardware is in charge of taking us to this location?

At address 0x88. Nested Vectored Interrupt Controller

6. What is the purpose of *#defines*, and why are they better than allocating variables sometimes?

defines typically do not allocate memory, but are simply used by the compiler for substitutions.

7. Write a C function that initializes P1.28 to be an output, and P1.29 to be an input without altering the other bits. Then have the code activate P1.28. Your code should not return anything. Assume that the defines are already set up for you in #lpc17xx.h

```
#include "LPC17xx.H"
void hw8(void){

LPC_GPIO1->FIODIR |= 0x10000000 // P1.28 an output
LPC_GPIO1->FIODIR &= 0xDFFFFFFF // P1.29 an input
LPC_GPIO1->FIOPIN |= 0x10000000 // active P1.28

}
```