EE 308 – Homework 5

Due Feb. 17, 2006

1. For the homework problems which follow assume you have included the file `hcs12.h` in your C program. Thus, you can refer to `PORTB` when you want to access a byte at address `0x0001`. Where I ask for "some code" just write that part of a C program which will do the task. Where I ask for "a program" write a complete program, include the `#include "hcs12.h"` line, the declaration of variables, the `main()` function, etc.

2. Write some C code which will set bits 5 and 2 of the eight-bit register at address `0x0075` while leaving the other bits unchanged.

3. Write some C code which will clear bits 14, 12, 7 and 1 of the sixteen-bit register at address `0x0076` while leaving the other bits unchanged.

4. Consider an array of 8-bit data located in memory with a starting address of `$2000` and an ending address of `$201F`. Write a C program which will swap the first element of the array with the last element; the second element with the next-to-last element, etc.

5. Write a C program which makes `PTH` an output and `PORTB` an input. Then write an infinite loop which reads an eight-bit signed number from `PORTB`, and displays the following on the seven-segment LED connected to `PTH`: `"C"` if the value on `PORTB` is less than 50, `"H"` if the value on `PORTB` is greater than 95, and `"-"` if the value on `PORTB` is between 50 and 95. PORTH.

6. Write a C program which counts the number of negative 16-bit numbers in a table. The table (of 16-bit signed numbers) starts at address `0x8000` and ends at address `0xFFFF`. Print the count to the screen, using the `printf()` function of DBug-12.

7. Write a program which displays the string `EE 308 IS COOL` on the seven-segment LEDs connected to PTH. There should be about a 100 ms delay between the letters.