ELEC 5260/6260 – Problem Set 2

Problem 1 – Due Tuesday, 1/29/13 by 11 am.

Problems 2 and 3 – Due Friday, 2/1/13 at class time.

For all three problems, write ARM assembly language programs, and in the Keil MDK-ARM IDE, create a project for each, enter the program, and then execute and debug it in the Keil MDK-ARM debugger. You may run the programs either in the simulator or in RAM on the STM32F4-DISCOVERY board. All program variables are to be 32-bit integers. You may choose your own test data values.

For each program provide (1) a printout of the source program, and (2) one "screen capture" of the debugger memory window, showing the program results at the conclusion of the program. (The results written by the program.) Please circle the results in the memory window.

1. Compute: zz = aa*(bb+cc) – (dd*35);
   Place aa,bb,cc,dd in your code area, so that you can provide initial values with "DCD" assembler directives. Please zz in the data area, so that you can write the result to it. The final debug window should show the final value of zz in memory.

2. Implement the following C code, to exercise program control statements. Place mm, nn, jj, and cc in the code area, with initial values defined by DCD directives, and place kk and xx in the data area. Circle the values of kk and xx in the final debug window.

   Execute this program twice – once to show execution for the tested condition true, and once to show execution for the tested condition false.

```
if ((mm – nn) < 15) {
        kk = jj – 5;
        xx = 0;
} else {
        kk = cc + 18;
        xx = 1;
}
```

3. Implement the following C code, to exercise memory addressing modes to handle arrays. Place arrays aa and bb in the code area, with initial values. Place variable i and array zz in the data area. Circle the final values of i and zz in the debug window.

```
for (I = 0; i < 15; i++)
    zz[i] = aa[i] – bb[i] + 5;
```