#HW, cec32x_HW_28_HW5_data_representations_and_programming, 140 points total.

HW 5. Data representations and mixed programming

Prob 5-1. (60 points total, 10 points each) Determine the result in both decimal and binary format and C and V flags of the following calculations for a 5-bit system using the C and V flag convention of an ARM processor:

```
1.  (-16) + (-16)
2.  14 - (-16)
3.  14 - 16
4.  15 - (-6)
5.  15 + (-6)
6.  14 + (-16)
```

Prob 5-2. (20 points total, 5 points each) Suppose we run the following statement: `function1(0xF, 0xFF, 0xFFF, 0xFFFF);`. What will be the values of registers R0, R1, R2, and R3 immediately after the program runs within function declared as `function1(uint32_t x, uint32_t y, uint32_t z, uint32_t w);` due to this call?

Prob 5-3. (10 points total, 5 points each) Suppose we have defined two variables as `int8_t var1 = 0xF;` and `int8_t var2 = 0xFF;` and run the following statement: `function2(var1, var2);`. What will be the values of registers R0 and R1 immediately after the program runs within function `function2(int8_t x, int8_t y)` due to this call?

Prob 5-4. (10 points total, 5 points each) Suppose we call a function that calculates the center of gravity of an aircraft using the Q15.16 format for the return. To which of the register(s) the value has to be loaded within the function so that that value can be taken by the caller? What if we use the Q31.32 format?

Prob 5-5. (10 points total) Suppose the Q15.16 value returned from the above problem is 3.25. What will be the value in R0 before the function returns?

Prob 5-6. (10 points total) Which is the instruction in the assembly function on page 8/9 of the class notes for Module 5 that stops the function and returns to the caller?

Prob 5-7. (20 points total) Write an improved C language version of the assembly function on page 8/9 of the class notes for Module 5. Note that the improvement is to return the number of bytes you copied from the source to the destination instead of using the global variable `count`. (Note that you still use the same two parameters for the function as before, and also you need to use the ending null character `'\0'` of the string pointed by `src` to stop the loop of the function.)