HW 4 - ARM Assembly Language (30 points)

Due by Friday March 11th at the start of class at 9:20AM.

In this homework assignment you are going to redo two of the problems from HW 1 but in ARM Assembly language.

1. [10 points] Write an ARM Assembly language function **sum3or5** that takes an integer parameter **n** and returns the sum of the integers less than **n** that are multiples of 3 or 5. For example if **n** was 10 then the function would return 23 because 3 + 5 + 6 + 9 = 23. Put your code in a file named **sum3or5.s**

2. [10 points] Consider the integer sequence defined as follows. Starting with any positive integer: If n is even, the next number in the sequence is n / 2. If n is odd, the next number in the sequence is 3n + 1. It is conjectured (though it is not known) that every such sequence eventually reaches 1. For example, if we started with 10 then the sequence is 10 5 16 8 4 2 1. Write an ARM Assembly function named **sequence** that takes an integer **n** and returns the length of the sequence generated. In the above example this would be 7.

3. [10] Write a main program in C (**main.c**) that takes one non-negative integer command line argument and calls both **sum3or5** and **sequence** for that argument. Remember, good programs do not crash, they fail gracefully with an error message.
   a. Verify that the number of command line arguments is correct
   b. Verify that the command line argument contains only digits by looping through the string and making sure each character is a digit. Don't do this in main. Write a C function named **verifyarg** that takes a string as a parameter and returns true if the parameter contains only digits, false otherwise.

What to turn in

Create a directory **hw4** and create files **sum3or5.s**, **sum3or5.h**, **sequence.s**, **sequence.h**, and **main.c**. Push the files to your course repo by the due date.