

CSE 2312: Computer Organization & Assembly Language Programming Summer 2015 Program #1

In this assignment, you will program a simple calculator for the Raspbian OS using ARM assembly. Your program, at a minimum, will consist of the following procedure calls:

SUM: Adds registers R1 and R2, returning result in register R0.

DIFFERENCE: Subtracts register R2 from R1, returning result in register R0.

PRODUCT: Multiplies registers R1 and R2, returning the result in register R0.

MAX: Compares registers R1 and R2, returning the maximum of the two values in R0.

Your main function will contain a loop that continuously checks for keyboard input in the following pattern:

```
<OPERAND_1><ENTER>
<OPERATION_CODE><ENTER>
<OPERAND_2><ENTER>
```

Where `<OPERATION_CODE>` can be any of the four characters `{+, -, *, M}`. Once the 3 lines of input are acquired, the operands should be loaded into the proper registers and the procedure corresponding to `<OPERATION_CODE>` should be called. The procedure should return the result in register R0, and the main function should print the value to the console and skip to a new line.

You may ignore overflows, underflows, and improperly formatted input. All input test cases will consist of positive numbers only. Below are some example use cases:

| | | | |
|-------------|-----|-----|----|
| 5 | 100 | 5 | 50 |
| + | M | * | - |
| 15 | 200 | 20 | 20 |
| 20 <-result | 200 | 100 | 30 |

Points will be assigned as follows:

1. Main function correctly retrieves 3 input parameters, prints result in a continuous loop (20 points)
2. SUM, DIFFERENCE, PRODUCT, MAX procedures implemented (10 points each)
3. SUM, DIFFERENCE, PRODUCT, MAX procedures return correct values on all test cases (10 points each)

Submit your solution as a single ".s" file to Blackboard. Name the file "p1_1000xxxxxx.s", where 1000xxxxxx is your UTA ID number.

*** Be sure to check <http://github.com/cmcmurrough/teaching/assembly> for useful code snippets ***