ASM Homework 2

Advanced Calculator

In homework 2, you are asked to design a advanced calculator, which supports signed addition, subtraction, multiplication, division and modulo operations.

Your program should take two integers m, n and an operator as inputs, then outputs the calculated result according to the given operator.

Both m and n are in the range of -32768 to 32767, and the operator will be a character: '+', '-', '*', '/' or '%'.

You can only use the following instructions in your program:
mov, ***add***, ***sub***, ***inc***, ***dec***, ***neg***, ***loop***, ***call***, ***ret***, ***exit***, ***cmp*** and all conditional jump instructions (***j_***).

Do not use the built-in multiplication and division instructions, and all the other instructions that are not listed above.

Try to utilize ***add***, ***sub*** and the conditional instructions to implement multiplication, division and modulo operations.

For division and modulo operators, the definitions of quotient and remainder are the same as in C language but not in mathematics. For example:

Division	Quotient	Remainder
7 / 2	3	1
(-7) / 2	-3	-1
7 / (-2)	-3	1
(-7) / (-2)	3	-1

If the divisor is zero, you should output the error message "divided by zero".

I/O Format

Inputs are three lines, where the 1st and the 3rd lines are the integers m and n, respectively, and the 2nd line is the operator. After that, you should output the result in one line.

I/O Example 1

```
4          // Input, the integer m.
+          // Input, "addition".
2          // Input, the integer n.
+6         // Your output.
```

I/O Example 2

-3	// Input, the integer m.
-	// Input, "subtraction".
5	// Input, the integer n.
-8	// Your output.

I/O Example 3

2	// Input, the integer m.
*	// Input, "multiplication".
5	// Input, the integer n.
+10	// Your output.

I/O Example 4

10	// Input, the integer m.
/	// Input, "division".
-3	// Input, the integer n.
-3	// Your output.

I/O Example 5

-7	// Input, the integer m.
/	// Input, "division".
0	// Input, the integer n.
divided by zero	// Your output.

I/O Example 6

-10	// Input, the integer m.
%	// Input, "modulo".
4	// Input, the integer n.
-2	// Your output.

I/O Example 7

5	// Input, the integer m.
%	// Input, "modulo".
0	// Input, the integer n.
divided by zero	// Your output.

Report

Write a brief report to introduce how you implement the multiplication, division and modulo operations.

Grading

- Addition: 10%
- Subtraction: 10%
- Multiplication: 20%
- Division: 25%
- Modulo: 25%
- Report: 10%

Requirements

1. The testing environment is Microsoft Visual Studio 2010, so make sure that your program can correctly run on it.
2. Submit your souce code (.asm) and report (.pdf, .doc, or .docx) on the E3 platform.
3. The deadline is 2013/4/21 (Sun.) 23:59, no late work will be accepted.
4. DO NOT PLAGIARIZE, or you will get ZERO in this work.