Homework 7

Due: Oct. 21, 2024 11:30pm

Objective

To learn how to use [illegible]uctions, simple command line parsing, and writing basic I/O syst[illegible]s.

Textbook Reading (for next homework):

1. Chapter 9: Section 9.1, Section 9.2
2. Chapter 9: Section 9.4, Section 9.5

Instruction

1. Write a program to make an elementary calculator, displayed on the HyperTerminal connected to the HCS12 board.

2. The calculator rules are:

    1. Input positive decimal integer numbers only
    2. Input and output maximum **four** digit numbers only
    3. Valid operators are: +, -, *, and /
    4. Input number with leading zero is OK
    5. Input only two numbers and one operator in between, no spaces
    6. Show 'Ecalc> 'prompt and echo print user keystrokes unltil Return key
    7. Repeat print user input and print answer after the '=' sign
    8. In case of an invalid input format, repeat print the user input until the error character
    9. In case of an invalid input format, print error message on the next line: 'Invalid input format'
    10. Keep 16bit internal binary number format, detect and flag overflow error
    11. Use integer division and truncate any fraction

3. The HyperTerminal display should look something like the following:

```
Ecalc>
Ecalc> 123+4
       123+4=127
```

```
Ecalc> 96*15
       96*15=1440
Ecalc> 456@5
       456@
       Invalid input format
Ecalc> 7h4*12
       7h
       Invalic
Ecalc> 3*54312
       3*54312
       Invalic                    ;due to 5th digit
Ecalc> 003-678
       003-678
Ecalc> 100+999*2
       100+999*
       Invalid input format
Ecalc> 555/3
       555/3=185
Ecalc> 7*(45+123)
       7*(
       Invalid input format
Ecalc> 78*9999
       78*9999
       Overflow error
Ecalc> -2*123
       -
       Invalid input format
Ecalc> 73/15
       73/15=4
Ecalc>
```


4. Make your program user friendly by giving directions as to how to correctly use your program.

5. You may want to see the Flow Chart of the above algorithm.

6. Also, make your program 'fool-proof', never crash or stop based on wrong user response.

7. You may add other features or decorations.

8. Design the program to start at $3100 and data to start at $3000.

9. Be sure to put much comments so that grader and others can clearly and quickly understand your program. Comments are very important in assembly language programs.

10. Copy your 'main.asm' file to 'cmpen472hw7_YourLastName.asm'. For example, mine will be 'cmpen472hw7_choi.asm' (Do not ZIP your file.)

11. Turn-in your project source code file through Penn State CANVAS. Upload your source code file into the CANVAS Assignment's Homework submission. Be sure to select CMPEN 472 class and correct Homework number, and wit ame.

Congratulations on y MPEN 472 homework completion!

Epilogue:

Flow chart for the Homework 7. Click here.

Aid for the Homework 7. Click here.
