

Homework 3 – due Wedn. 25 Feb.

- (1) In the book, page 185, translate the program of exercise 9.(b) into assembly language.
- (2) In the book, pages 227-228, do exercises
6 (read exercise *5), and
8 (read exercise *7).
- (3.1) In the book, page 228, do exercise 9. Draw the memory bytes used and the registers used, with their content, before and after execution of the program.
- (3.2) Run the program of exercise 9 on the Pep8 simulator.
Hand in the hexadecimal program, and the print-out of the files that the simulator generates.
- (4.1) Write an assembly program that computes the least significant decimal digit of a number n as well as $n//10$. The number n is provided by the “decimal input” command. We assume $0 \leq n < 2^{15} = 32768$. Internally, n will be stored in binary.
Make a copy r of n . Your program should repeatedly subtract 10 (= 0b1010) from r , while incrementing the *quotient* q , until $r < 10$; then r will satisfy $0 \leq r < 10$ (i.e., r is the *remainder*). In this process, the original n remains unchanged. Three variables, n , q , r , should be used.
Output the resulting r and q using text output “r = ” and decimal output, as well as text output “q = ” and decimal output. Test your program with the Pep8 simulator.
- (4.2) Write a narrative that explains, line by line, what your assembly program does, and why it should do that. You can base your reasoning on a high-level programming language, or on a flow-chart. (Refer to the lines by their addresses.)

THE Pep8 SIMULATOR

On clam (in the Lab), go to the directory `/usr/local/Pep8`
(e.g., with the unix command `cd /usr/local/Pep8`).

Type `./Pep8`

and wait for the simulator window to open. From there on it’s self-explanatory (in combination with the book, chapters 4 and 5).

A source code file must end with `.pep`; after loading, the object code will appear in the corresponding file with ending `.pepo`; and the assembler listing of the program will appear in the corresponding file with ending `.pepl`.

If you have problems with the Pep8 simulator, let me know (but don’t wait till the last day).