HW4

1. Explain the following definitions.
   a. Naked machine (page 240)
   b. System software (page 241)
   c. Virtual machine (page 242)
   d. GUI (page 243)
   e. Operating System (page 243)
   f. Source program (page 246)
   g. Pseudo-op (page 249)

2. Read the following segment of assemble language code, and answer questions below.

   LOAD ONE
   STORE ID
   INCREMENT ID

   ID: .DATA 0
   ONE: .DATA 1

   a. What will be the value at location ID after executing this program? (2)
   b. What is the function of “.DATA”? (Pseudo-op for data generation)
   c. If change the order of the second and the third instruction, what will be the value at location ID after executing this program? (1)

3. Read the following program, and answer questions:

   LOAD B
   ADD C
   SUBTRACT SEVEN
   STORE A

   A: .DATA 0
   B: .DATA 0
   C: .DATA 0
   SEVEN: .DATA 7

   a. What is the function of this program? (A = B + C - 7)
b. According to the discussion in the class, to make this program a complete source program, we need to mark the beginning and end of the program, what pseudo-ops will you use? And where will you put it? (.BEGIN, .END, put .BEGIN before “LOAD B”, .END after “SEVEN :...”)

c. In addition, to make this program a complete program, what instruction is always needed? And where should we put it in above program? (HALT, just before the data generation part)

Note: also review the third example in the slides about assembly language and make sure you understand this program.