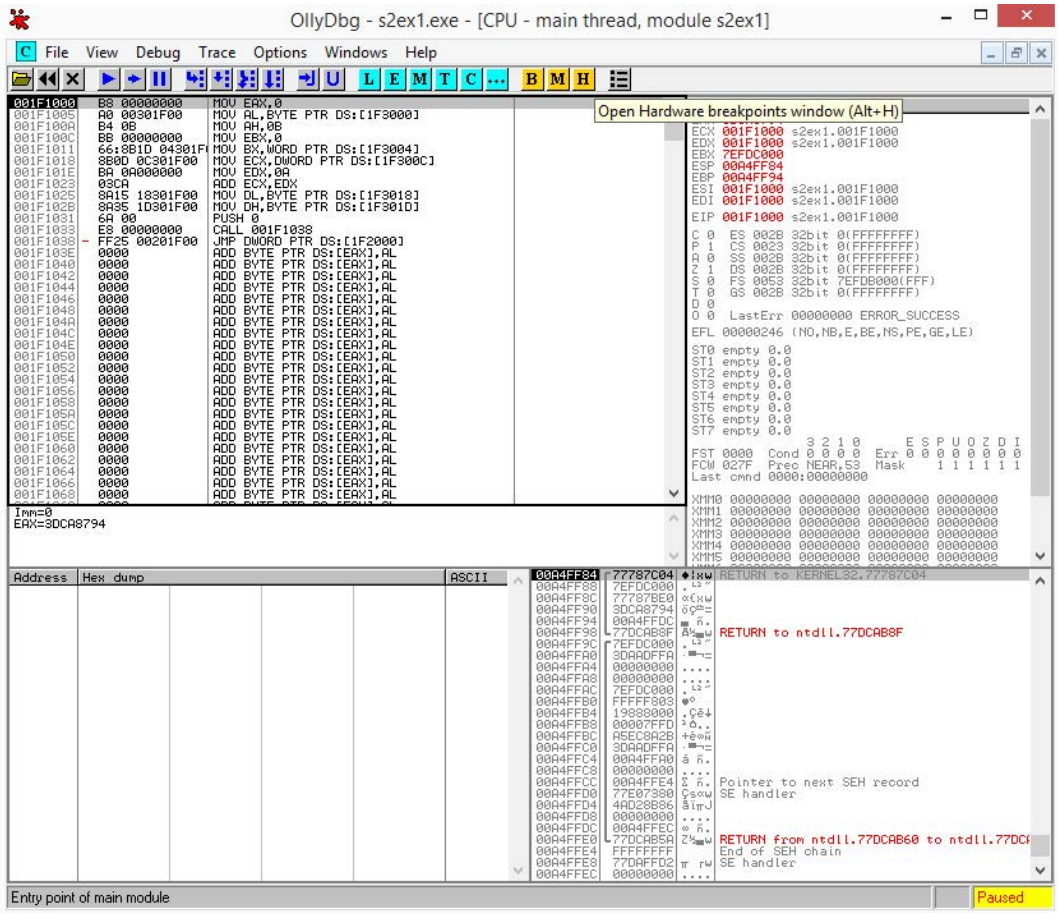
Week 3

1. Answer the following questions:
    A. Which is the sintax of an instruction?
    B. What is a label?
    C. Explain how the following instructions work (what they do, how many parameters, which restrictions):
        a. MOV, LEA
        b. INC, DEC
        c. ADD, SUB, CMP, MUL, DIV
        d. NOT, AND, OR, XOR, TEST
        e. PUSH, POP
    D. How do we declare data? Which are the accepted data types?
    E. How do we declare constants?
    F. How do we declare segments?
    G. How do we declare procedures?
    H. What does ASSUME directive mean?
    I. What does END directive mean?
2. Open s3model.asm with Notepad. The file contains a program model in .EXE format. Please read with care the comments.
3. Open s3ex1.asm with Notepad. Please follow:
    a. Data declarations
    b. Constant declarations
    c. Program structure
    d. Identify the directives, labels and instruction format
4. Compile s3ex1.asm with MASM Minimal and execute with Olly Debugger (Ollydbg):
    a. Each student will create his own folder and will copy here the archive found at http://users.utcluj.ro/~madalin/teaching-SM.html -> ASM tools. Unzip the archive.
    b. Open Notepad++ from "NPP/notepad++.exe". Open s3ex1.asm within.
    c. Compile s3ex1.asm using the menu "Plugins -> MASM Plugin -> Build MASM. For debugging, use "Plugins -> MASM Plugin -> Debug program (ollydbg)".

d. In the OllyDbg window, identify the zones for code, data, registers, flags and stack.



e. Execute the program instruction by instruction, press F7 once for the execution of one instruction. To view the memory, right-click with the mouse on an instruction that uses a variable declared in the data segment and then "Follow in Dump -> Memory address".

f. Follow the way in which data is kept in the memory. Each square in the drawing below represents a memory location (1 byte). Fill in the content of each memory location for the data segment in this program and highlight where each variable starts.

Hex Dump

g. Execute each instruction and follow the changes in the registers, flags and stack.

5. Compile and execute s3ex2.asm. The program computes the sum of 6 values declared in the data segment.

6. Write a program that computes the average value of 6 values declared in the data segment.