

**16.317 Microprocessor I, Spring 2007**  
**Lab 1: DOS commands and DEBUG software**  
**Due on 02/09/2007, 12:30pm EST**

**Objective**

Learn how to:

1. Boot up DOS, edit a file, save a file, copy a file, move a file, delete a file.
2. Run/quit DEBUG software, show/modify register content, show/modify flags, dump memory contents, assemble and debug programs.

**Part 1: DOS commands**

In this part of the lab, you will get familiar with MS-DOS commands. Although DOS is a rather old operating system for PCs, it was widely used in 80's and early 90's. You will use DOS extensively in this course as you learn 80386 real-mode assembly language programming.

Commonly used DOS commands

(reference: <http://www.computerhope.com/dostop10.htm>)

Command	function
dir	The dir command allows you to see the available files in the current and or parent directories.  <b>dir /p</b> - list the directory content and pause for long list
cd	CD (Change Directory) is a command used to switch directories in MS-DOS. For example:  <b>cd lab1</b> - Changing the directory to lab1. <b>cd ..</b> - changing the directory to upper level.
edit	Edit allows a user to view, create and or modify their computer files.  Alt-F gets you to the menu of edit. You can save or open another file from the menu.
copy	Allows the user to copy one or more files to an alternate location.  <b>copy file.asm newfile.asm</b>
del	Del is a command used to delete files from the computer.  <b>del file.asm</b>
move	Allows you to move files or directories from one folder to another or from one drive to another.
ren	Used to rename files and directories from the original name to a new name.

mkdir	Allows you to create your own directories in MS-DOS.
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You need to create a directory and name it with your UML email account. For example, name your directory as “first\_last” if you email address is [first\\_last@uml.edu](mailto:first_last@uml.edu). Inside this directory, you need to create a subdirectory called **lab1**. Inside **lab1**, you need to create a file named **test.asm**.

## Part 2: Use DEBUG program

You will learn how to run DEBUG and use its commands in this part of the lab.

The following is a list of DOS Debug commands:  
(reference: <http://kb.iu.edu/data/afhs.html>, or you can find the list on page 106 of the text.)

- ? Displays a list of debug commands
- a Assembles 8086/8087/8088 mnemonics
- c Compares two portions of memory
- d Displays the contents of a portion of memory
- e Enters data into memory starting at a specified address
- f Fills a range of memory with specified values
- g Runs the executable file that is in memory
- h Performs hexadecimal arithmetic
- i Displays one byte value from a specified port
- l Loads the contents of a file or disk sectors into memory
- m Copies the contents of a block of memory
- n Specifies a file for an l or w command, or specifies the parameters for the file you are testing
- o Sends a single byte value to an output port
- p Executes a loop, a repeated string instruction, a software interrupt, or a subroutine
- q Stops the Debug session
- r Displays or alters the contents of one or more registers
- s Searches a portion of memory for a specified pattern of one or more byte

- values
- t Executes one instruction and then displays the contents of all registers, the status of all flags, and the decoded form of the instruction that Debug will execute next
- u Disassembles bytes and displays the corresponding source statements
- w Writes the file being tested to a disk
- xa Allocates expanded memory
- xd Deallocates expanded memory
- xm Maps expanded memory pages
- xs Displays the status of expanded memory

You need to practice DEBUG commands by reproducing the examples in the textbook. Specifically, you need to practice the following categories of commands:

**Register and flag**

Example 4.9, 4.10, 4.11 (page 109-111)

**Memory**

Example 4.14, 4.15, 4.16, 4.17, 4.18, 4.19 (page 112-121)

**I/O**

Example 4.20 (page 122)

**Hexadecimal**

Example 4.22 (page 124)

**Check off**

Check off part 1: Show the files and subdirectories you created to the TA.

Check off part 2: Demonstrate 4.9, 4.10, 4.11, 4.17, and 4.18 to the TA.

**Note: Please turn in your check-off page (with TA's signature) along with your report.**

**Grading**

Component	grade
Check off part 1	15%
Check off part 2	15%
Report	70%
Total	100%
Percentage in course	3%

**We use the following grading rubrics.**

Item	Criteria	Full Points	Actual Points
Check-off	Part 1 and 2	30	
Lab report organization	Name, lab number, partner number, purpose, content, difficulties, conclusion	10	
Example 4.9	Any print-out, screen capture or a list of the commands practiced to demonstrate the completion of this example	10	
Example 4.10	Any print-out, screen capture or a list of the commands practiced to demonstrate the completion of this example	10	
Example 4.11	Any print-out, screen capture or a list of the commands practiced to demonstrate the completion of this example	10	
Example 4.17	Any print-out, screen capture or a list of the commands practiced to demonstrate the completion of this example	10	
Example 4.18	Any print-out, screen capture or a list of the commands practiced to demonstrate the completion of this example	10	
Style	10 points if substantial work is devoted into the report. Zero point for reports with very few words from the student.	10	
TOTAL		100	

***Partners can share screen capture or program print-out, however, each student MUST submit his/her own report. Duplicated reports (including both parties) are considered cheating, which result in a ZERO in the lab, reduction in letter grade for the course, grade of F for the course, and/or university administrative penalties.***

**Report format**

Your report needs to follow the format below.

**Lab # and title:**

**Student Name:**

**Partner's Name:**

**Lab Purpose:**

<It is usually the objective of the lab.>

**Lab Content:**

< Answer the questions in lab specification. Describe what you do in the lab, e.g. what commands you practiced. It has to be at least one page with 11pt font size. Try to organize and summarize the lab in itemized lists.>

**Difficulties:**

< state what difficulties you encountered in the lab and how you managed to solve it. If not, what have you tried? >

**Conclusion and Suggestions:**