

# **16.317: Microprocessor Systems Design I**

Fall 2015

## Lecture 5: Key Questions September 14, 2015

1. Describe the basic structure of an assembly language statement.
2. Describe how the x86 registers are accessed as 8-bit, 16-bit, and 32-bit values. Include the answer to the example provided in the slides (EAX = 1A2B3C4DH).
3. Describe how to determine the number of bytes being accessed from memory in an x86 instruction.

4. Describe the use of the MOV instruction.

5. The example program below shows the initialization of internal registers with immediate data and address information, using MOV instructions. Show the state of all affected registers. Also, explain why AX is used to initialize segment registers.

```
MOV AX,2000H
MOV DS,AX
MOV ES,AX
MOV AX,3000H
MOV SS,AX
MOV AX,0H
MOV BX,AX
MOV CX,0AH
MOV DX,100H
MOV SI,200H
MOV DI,300H
```

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9. Explain the operation of the LEA instruction.

10. **Example:** Given the initial memory state below:

	Lo		Hi	
0x528000	50	88	31	A3
0x528004	B2	FF	0F	7D
0x528008	07	D0	BE	22
0x52800C	11	96	00	14

Show the results of the following short instruction sequence.

```
MOV    EAX, 528000h
MOV    EBX, [EAX+2]
XCHG   BL, BH
LEA     EDX, [EAX+8]
MOV     ECX, [EDX-3]
```