

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
```

6. Describe the operation of the MOVZX/MOVZX instructions. How/when are these instructions useful?

7. Assume: AX = 0100H, DX = 8100H, (100H) = 00H, (101H) = FFH. What are the results of the following instructions?
 - a. MOVZX EBX, AX

 - b. MOVZX EBX, DX

 - c. MOVZX EBX, DX

 - d. MOVZX EBX, BYTE PTR [100H]

 - e. MOVZX EBX, WORD PTR [100H]