EECE.3170: Microprocessor Systems Design I

Summer 2017

Lecture 6: Key Questions May 31, 2017

1. Describe the operation of the compare instruction.

2. Complete the following table that describes the different x86 condition codes.

Mnemonic (cc)	Condition tested	Status flag setting for true condition
0		
NO		
B, NAE, C		
NB, AE, NC		
S		
NS		
P, PE		
NP, PO		
E, Z		
NE, NZ		
BE, NA		
NBE, A		
L, NGE		
NL, GE		
LE, NG		
NLE, G		

3. Describe the operation of the conditional move instruction.

4. Describe the operation of the SETcc instruction. How can this instruction be used?

5. Example: Show the results of the following instructions, assuming that (100H) = 0001H, (102H) = 0003H, (104H) = 1011H, (106H) = 1011H, (108H) = ABCDH, (10AH) = DCBAH

What complex condition does this sequence test?

MOV AX, [100H] **CMP** AX, [102H] SETLE BLMOV AX, [104H] **CMP** AX, [106H] SETE BH AND BL, BH AX, [108H] MOV AX, [10AH] **CMP SETNE** BHBL, BH OR

6. Describe the two general classes of jump instruction.

- 7. Given the instructions below, what are the resulting register values if:
 - AX = 0010H, BX = 0010H
 - AX = 1234H, BX = 4321H

What type of high-level program structure does this sequence demonstrate?

CMP AX, BX

JE L1

ADD AX, 1

JMP L2

L1: SUB AX, 1

L2: MOV [100H], AX

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8. **Example:** Given the instructions below, what are the resulting register values if, initially, AX = 0001H?

What type of high-level program structure does this sequence demonstrate?

MOV CX, 5

L: SHL AX, 1

DEC CX

JNZ L

9. **Example:** Given the instructions below, what are the resulting register values if, initially, AX = 0001H?

What type of high-level program structure does this sequence demonstrate?

MOV CX, 5

L: JCXZ END

ADD AX, AX

DEC CX

JMP L

END: MOV [10H], AX

10. Describe the x86 loop instructions, as well as how these instructions can be used in a typical program.

11. Rewrite the post-tested loop example from earlier to use a loop instruction.

MOV CX, 5

L: SHL AX, 1

DEC CX

JNZ L

12. Describe the operation of the following program.

What is the final value of SI if the 15 bytes between 0A001 and 0A00F have the following values?

00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E

MOV DL, 05

MOV EAX, 000A000h MOV ESI, 00000000h

MOV CX, 000Fh

AGAIN: INC ESI

CMP [EAX+ESI], DL

LOOPNE AGAIN