EECE.3170: Microprocessor Systems Design I

Fall 2016

Lecture 13: Key Questions
October 5, 2016

1. (Review) Describe the two general classes of jump instruction.

2. (Review) 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
```

3. **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
```

4. **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
```

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

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

```
        MOV   CX, 5
L:      SHL   AX, 1
        DEC   CX
        JNZ   L
```

7. 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
```