16.317: Microprocessor Systems Design I

Fall 2013

Lecture 15: Key Questions
October 9, 2013

1. Describe the two general classes of jump instruction.

2. 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 80386 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   AX, 0A00
            MOV   DS, AX
            MOV   SI, 0000
            MOV   CX, 000F
AGAIN: INC   SI
            CMP   [SI], DL
            LOOPNE AGAIN