16.317: Microprocessor Systems Design I

Spring 2012

Lecture 18: Key Questions
March 7, 2012

1. **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   CL, 5
L:    SHL   AX, 1
      DEC   CL
      JNZ   L
```

2. **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   CL, 5
L:    JZ    END
      ADD   AX, AX
      DEC   CL
      JMP   L
END:  MOV   [10H], AX
```

3. Describe the 80386 loop instructions, as well as how these instructions can be used in a typical program.

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

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

5. Describe the operation of the following program (Example 6.15-6.16).
   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
```

6. Describe the general structure and purpose of a subroutine.

7. Describe the basics of subroutine instructions specific to the 80386.