16.317: Microprocessor Systems Design I

Fall 2013

Lecture 4: Key Questions
September 11, 2013

1. Describe the different memory spaces in the x86 architecture.

2. Explain the basic concept of memory segmentation.

3. Describe the specifics of x86 memory segmentation.

4. Describe how x86 real mode addresses are generated, including the components of the address and the actual calculations performed.

5. **Example:** Given the following register values:

- CS = 0x1000
- SS = 0x2000
- DS = 0x3000
- ES = 0x4000
- IP = 0x0100
- ESP = 0x0002FF00
- EBP = 0x0000F000
- ESI = 0x0001000E
- EBX = 0xABCD1234

What linear addresses correspond to the following logical addresses?

- CS:IP

- SS:SP

- SS:BP

- DS:SI

- ES:BX

6. Describe the different addressing modes specific to the x86 architecture.