16.317: Microprocessor Systems Design I

Spring 2014

Lecture 2: Key Questions
January 24, 2014

1. Briefly describe data types: what they specify, and what the different possibilities are for each aspect of a data type.

2. Explain the difference between how data can be interpreted as a signed or unsigned integer. Show the difference by interpreting the 8-bit value $1001\ 1111_2$ as both a signed and unsigned value.

3. What characteristics do we want storage media to have?

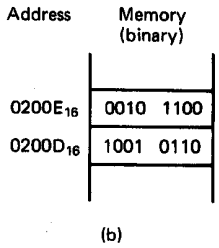
4. Describe the basic characteristics of processor registers.

5. Describe the basic characteristics of processor memory.

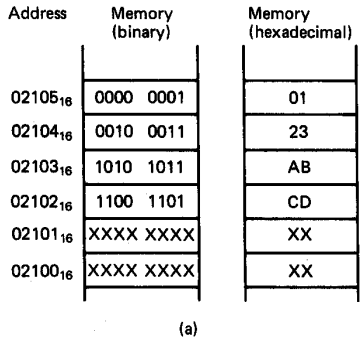
6. What does it mean for data to be aligned? What is the impact of mis-aligned data?

7. What is “little endian” data?

8. **Example:** Given the figure shown below (Fig. 2.5b), write the full data word in hexadecimal. Is this word aligned?



9. **Example:** Given the double word in this figure (Figure 2.7a), write the full double-word in hexadecimal. Is this double word aligned?



10. What are the three general types of locations where operands can be stored and the addressing modes associated with those locations?

11. Explain what an effective address is and how one is generally calculated.

12. Describe each of the general classes of memory addressing modes.