

## Class 4 and Lab 2: Review for Quiz 1

### Wed Sept 9

- Quiz 1 will begin the class and be 30 minutes long. After the quiz, we'll take a short break and have a short lecture.
- The quiz will be open book, open notes (but no sharing books or notes) and no support equipment (calculators, phones, computers; nothing more complicated than a retractable pen? :-)
- The quiz will cover the material from weeks 1 and 2 (Chapters 1 and 2 of the text).

### Goals/Outcomes

The goals/outcomes from the lectures, activities, and lab have been to learn:

1. That computer systems can be understood at different levels of abstraction and what those levels of abstraction are.
2. That all modern computers do the same kinds of calculations, just more- or less-efficiently.
3. That we know of no theoretical computer that's more powerful than our current computers (ignoring efficiency).
4. The three ways to represent signed binary integers.
5. The pros and cons of each system.
6. How to take the negative of a binary number in each system.
7. Say how many versions of zero there are and what they look like in each of the three system.
8. Say what the most positive and negative integers are in each of the three systems.
9. How to do subtraction in two's complement.
10. What overflow is, what it looks like, and when it occurs.
11. What what the extreme cases of 5-bit integers (00000, 11111, 01111, and 10000) represent.
12. Why we have floating-point numbers.
13. How impractical integers are for writing extremely large values.
14. How to use a binary point to represent fractional values
15. In general how floating-point numbers are represented.
16. The important general features of the IEEE standard for floating-point numbers.
17. How to convert between binary and octal/hexadecimal numbers.
18. How to convert between decimal and octal/hexadecimal numbers.
19. How textual characters are represented.
20. What critical piece of information you need to know if someone hands you some random bits and asks you "What does this represent?"

Added in lecture:

21. Know the difference between '2' (the character) and 2 (the decimal number).
22. Know how to use masks and logical operations to clear, set, and read bits of a bit pattern.
23. Know the relationship between NOT and 1's and 2's complement.

## Class 04 Activity

- Go through the list of goals above and select the three that (in your group's opinion) are the most important.
- For each of the three goals
  - If you think it's necessary
    - Rewrite the goal to be clearer or more precise or to do a better job of stating the underlying idea. Write this (and the goal number) onto an index card.
    - Think up a new question that tries to test your knowledge of the goal.
    - Write it (and the answer and the goal number) on an index card.

Here are the points selected today in class:

- 1 1 2 2 4 4 4 5 5 6 7 10 14 15 15/16 16 19 20

## Lab 2 (due Friday Sep 4 at the beginning of lab)

1. Do this three times: Look at the list of goals and pick two or more related ones. Write out a new goal that combines them into a more general goal.
2. Do this three times: Look at the list of goals and pick one. Break up the goal into two or more subgoals. Write out those subgoals and a question and answer that tests your knowledge of that subgoal.
3. (Optional) Study the list of goals and compare it to the material we've covered so far in the course. Are there any goals that should be added to the list? If so, write them out. For each one, include a question/answer that tests your knowledge of the goal.