

Study Questions for Patterson & Hennesey, Sections 3.1–2

The exam on Monday will not cover Section 3.2 Here is a brief review of your reading for Section 3.2, with emphasis on what was and was not in the text.

Section 3.2

Lecture discussed signed magnitude and 1's complement negatives, and briefly alluded to biased negatives, but concentrated on the IEEE standard format for negatives: 2's complement.

We learned about sign extension, about the difference between addi and addiu, and about the possibility of overflow (actually taken from p. 172, which is in the next section).

Here is what was in the section that we did not cover until later: The unsigned versions of the familiar operations, lbu, lhu, sltu, sltiu. You should read about them with understanding.

Now that we know that the same bit pattern can be treated as signed or as unsigned, it makes sense to have different MIPS instructions for each of the two ways to treat them.

Correction: On page 166, there is a missing overbar to mean “not” or 1's complement. Replace the sentence “Since $x + \bar{x} = -1$, therefore $x + \bar{x} + 1 = 0$ or $\bar{x} + 1 = -x$.” with the sentence: “Since $x + \bar{x} = -1$, therefore $x + \bar{x} + 1 = 0$ or $\bar{x} + 1 = -x$.”

Skills: You should be able to write the bit pattern for any number, positive, negative, or zero; and to add and subtract binary numbers.