

1. How do sense amplifiers improve memory performance?

1. They speed up memory by quickly detecting small changes in voltage (or current in some memories) on the bit lines and amplifying them into full swing logic zeros and ones.

2. Give one advantage and one disadvantage of a 3-operand ISA ( $a = b + c$ ) over a 2-operand ISA ( $a = a + b$ ).

1. 3 operand instructions are more complex (not quite true)
2. Advantage: preserves both inputs. Disadvantage: fewer bits per register input.

3. A colleague proposes using 6 (instead of 5) bits for one of three operands in MIPS. What other changes would be required to the ISA? Would you endorse their plan? Why or why not?

1. The extra bit needs to come from another instruction field.
2. You would need some special instructions to move values to/from regs 32-63
3. The plan is a bad idea because the resulting ISA is non-uniform.
4. Other answers: hw complexity (not much, I think), sw-complexity (adding the move instructions would be a pain), non-compatibility (a concern, but don't worry about it unless the question mentions it explicitly)

4. How is the pace of class so far? If it's too fast or slow, what would you add or remove?

1. 1 - too slow, 7 just right, 9 too fast, a few abstainers.
2. Changes: Highlight key points, redundancies with 140, review more of 140, cover more material from the book, more help with the project, more info on old ISAs and how we got to MIPS-like designs