CS 210 Multiple Choice Quiz 4
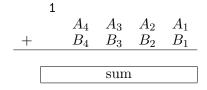
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1. Suppose we have to unsigned binary number $A = A_4A_3A_2A_1$ and $B = B_4B_3B_2B_1$. What's the simplest way to *subtract* these two numbers (i.e., compute $A - B$) in the hardware?

   A Use the grade-school "borrowing" algorithm

   B Form the 2's complement of B, add it to A

   C Perform **B**, but
   - if there's an end carry, discard it
   - if there's no end carry, form the 2's complement of the sum and prepend a minus sign

   D There is no suitable algorithm; A and B should be in signed 2's complement format

2. How do we form the 2's complement of an unsigned 4-bit binary number, $B = B_4B_3B_2B_1$?

   A Invert the values of each of B's bits

   B Compute $(1111)_2 - B$

   C Compute $(11111)_2 - B$

   D Compute $(10000)_2 - B$

3. Suppose we're adding two 4-bit binary numbers as though they were unsigned, and we know there's an end carry. What is the *minimum* value of the resulting sum?

$$
\begin{array}{ccccc}
 & 1 & & & \\
 & A_4 & A_3 & A_2 & A_1 \\
+ & B_4 & B_3 & B_2 & B_1 \\
\hline
 & \multicolumn{4}{c}{\text{sum}}
\end{array}
$$

   A sum $\geq (1111)_2$

   B sum $\geq (11111)_2$

   C sum $\geq (10000)_2$

   D None of the above

4. Suppose we know that $A + [(10000)_2 - B] \geq (10000)_2$. What can we conclude about the relationship between A and B?

   A $A \geq B$

   B $A = B$

   C $A \leq B$

   D None of the above

5. Suppose we know that $A + [(10000)_2 - B] = (10000)_2$. What can we conclude about the relationship between A and B?

   A $A \geq B$

   B $A = B$

   C $A \leq B$

   D None of the above