HW1
Due Date: 04/23

2.7 Create a table showing the decimal values of all 4-bit 2's complement numbers.

2.33 Compute the following:
   a. 01010111 OR 11010111   b. 101 OR 110
   c. 11100000 OR 10110100   d. 00011111 OR 10110100
   e. (0101 OR 1100) OR 1101   f. 0101 OR (1100 OR 1101)

2.43 Translate the following ASCII codes into strings of characters by interpreting each group of eight bits as an ASCII character.
   a. x48656c6c6f21
   b. x68454c4c4f21
   c. x436f6d70757465727321
   d. x4c432d32

3.21 You know a byte is 8 bits. We call a 4-bit quantity a **nibble**. If a byte-addressable memory has a 14-bit address, how many nibbles of storage are in this memory?

3.35 Given a memory that is addressed by 22 bits and is 3-bit addressable, how many bits of storage does the memory contain?

4.7 Suppose a 32-bit instruction takes the following format:

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| OPCODE | SR | DR | IMM |
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If there are 60 opcodes and 32 registers, what is the range of values that can be represented by the immediate (IMM)? Assume IMM is a 2's complement value.

5.13

a. How might one use a single LC-3 instruction to move the value in R2 into R3?
b. The LC-3 has no subtract instruction. How could one perform the following operation using only three LC-3 instructions: 
   
   \[
   R1 \leftarrow R2 - R3
   \]

c. Using only one LC-3 instruction and without changing the contents of any register, how might one set the condition codes based on the value that resides in R1?
d. Is there a sequence of LC-3 instructions that will cause the condition codes at the end of the sequence to be N = 1, Z = 1, and P = 0?
e. Write an LC-3 instruction that clears the contents of R2.