8.9. Exercises

1: Draw the lattice described in the first example in <u>Section 8.1.1</u>.

2: Prove Lemma 8–2.

3: Consider the systems Louie and Dewey in <u>Section 8.2.4</u>.

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    a. Suppose the sends and receives for the buffers are nonblocking. Is the composition of Hughie, Dewey, and Louie still noninterference-secure? Justify your answer.

    b. Suppose all buffers are unbounded. Is the composition of Hughie, Dewey, and Louie still noninterference-secure? Justify your answer.

4: Modify the two-bit system in the first example in <u>Section 8.3</u> as follows. Whenever a **High** operation is performed, the **High** state bit is output. Whenever a **Low** operation is performed, the **Low** state bit is output. The initial state is **not** output (in contrast to the example). Is this version of the two-bit system noninterference-secure with respect to Lucy? Why or why not?

5: In the second example in <u>Section 8.3</u>, Lucy sees the output sequence as 011011. Given that she knows the low-level input sequence, list all possible input sequences that match the known low-level input sequence and produce the desired output.   5

6: Prove that a system that meets the definition of generalized noninterference security also meets the definition of deducible security.

7: Suppose composite machine **catdog** (see <u>Section 8.4.1</u>) emits the same value from the left and the right. Show that it has received no inputs from the left.

8: Prove Theorem 8–5.

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