Homework #3

Due: February 23, 2023   **Points:** 100

Questions

1. (*20 points*) Prove Theorem 6–1 for the strict integrity policy of Biba's model.

2. (*20 points*) Consider the KeyNote example for the company's invoicing system. The assertion requires 2 signatures on any invoice under $10,000. If the invoice is under $500, the chief financial officer believes this is unnecessary; one signature should suffice. Write a KeyNote assertion that says only one signature is needed if the amount of the invoice is under $500.

3. (*30 points*) Let the Clinical Information Systems Security have the following functions: *create_record*, *delete_record*, *read_record*, *append_to_record*, *add_to_acl*, and *move_from_record_to_record*. Given these, show that the Clinical Information System model's principles implement the Clark-Wilson enforcement and certification rules.

4. (*30 points*) Consider the systems Louie and Dewey in Section 9.2.4.

   (a) Suppose the sends and receives for the buffers are non-blocking. 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.