

ITIS 6200/8200 (Fall 2018)
Principles of Information Security & Privacy
Homework 2

Deadline: 11:59pm on October 9, 2018. No late submission will be accepted.

Submission method: upload your solutions to Canvas in a PDF file.

Each student is expected to finish this homework **independently**. No collaboration is allowed.

Furthermore, if you search the Internet, copy, and paste an answer, you will get **zero** and can be subject to the academic misconduct procedures and sanctions.

1. Give an example of a situation in which a compromise of confidentiality leads to a compromise in integrity; and then give an example of a situation in which a compromise of integrity leads to a compromise in confidentiality.
2. Classify each of the following as an example of a mandatory, discretionary, or originator controlled policy, or a combination thereof. Justify your answers.
 - a. The file access control mechanisms of the LINUX operating system.
 - b. A system in which no memorandum can be distributed without the author's consent.
 - c. A military facility in which only generals can enter a particular room.
 - d. A university registrar's office, in which a faculty member can see the grades of a particular student provided that the student has given written permission for the faculty member to see them.
3. Given the security levels TOP SECRET, SECRET, CONFIDENTIAL, and UNCLASSIFIED (ordered from highest to lowest), and the categories A, B, and C, specify what types of access (read, write, both, or neither) is allowed in each of the following situations. Justify your answers by applying the definition of the **dominate** relationship. Assume that discretionary access controls allow anyone access unless otherwise specified.
 - a. Paul, cleared for (TOP SECRET, {A, C}), wants to access a document classified (SECRET, {B, C}).
 - b. Anna, cleared for (CONFIDENTIAL, {C}), wants to access a document classified (CONFIDENTIAL, {B}).
 - c. Jesse, cleared for (SECRET, {C}), wants to access a document classified (CONFIDENTIAL, {C}).
 - d. Sammi, cleared for (TOP SECRET, {A, C}), wants to access a document classified (CONFIDENTIAL, {A}).
 - e. Robin, who has no clearances (and so works at the UNCLASSIFIED level), wants to access a document classified (CONFIDENTIAL, {B}).
4. Suppose a system implementing Bell-LaPadula's model used the same labels for security levels and categories as for integrity levels and categories under the Biba model, which the system implemented. Under what conditions could one subject read an object? Write to an object?
5. A physician who is addicted to a pain-killing medicine can prescribe the medication for herself. Please show how RBAC in general, and Definition 7-11 on page 94 of the textbook specifically, can be used to govern the dispensing of prescription drugs to prevent a physician from prescribing medicine for herself.