

Homework 3
Software Security (502804-3)
Spring 2022

Due: Saturday April 2, 2022, 11:59 pm via Blackboard

1. Given the following access control model

	File 1	File 2	File 3
Jack	Read Write	Read Write Own	
Ali	Read Write Own	Write	Read

- A. Implement the access control list.
 B. Implement the capability list.

2. Describe the two rules of the Bell-LaPadula access control model and indicate the information flow in the security lattice enforced by each rule. Be precise!

3. Build the security lattice for

- a. Hierarchical component: Graduate > Undergraduate
 b. Domain component: {CSE, EE}

4. Indicate whether the following requests should be permitted or denied, where $l(s)$ and $l(o)$ represents the security label of the subject and object, respectively, s stands for subject and o for object.

A. s requests to write o $l(s)=(UG, \{CSE\})$, $l(o)=(UG, \{ \})$ permit deny

B. s requests to read o1 and o2 $l(s)=(G, \{CSE\})$, $l(o1)=(UG, \{ \})$, $l(o2)=(G, \{ \})$ permit deny

C. s requests to write o $l(s)=(G, \{EE\})$, $l(o)=(G, \{EE, CSE\})$, permit deny

D. s requests to read o1, o2, o3 $l(s)=(UG, \{CSE, EE\})$, $l(o1)=(UG, \{ \})$, $l(o2)=(UG, \{CSE, EE\})$, $l(o3)=(UG, \{CSE\})$ permit deny

E. s requests to write o1, o2 $l(s)=(UG, \{CSE\})$, $l(o1)=(G, \{CSE\})$, $l(o2)=(UG, \{ \})$ permit deny

5. What is security engineering? Why do we need security engineering?

6. What do we mean by “attaining software security”? How can you do that as a cybersecurity specialist?

7. What are software security touchpoints? How can you as a cybersecurity specialist link these touchpoints to security engineering?

8. Give an example Role-Based Access Control (RBAC) specification that cannot be expressed using Discretionary Access Control (DAC)