**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

|  |  |  |
| --- | --- | --- |
| Read  Write | Read  Write  Own |  |
| Read  Write  Own | Write | Read |

Jack

Ali

1. Implement the access control list.
2. 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)