CST-321 User Interface and Security

Activity Directions:

In this assignment, you will develop a user interface for **three different functions** of an operating system and address how each of the functions could be secured using various authentication schemes. You must support **one** single-factor and **one** two-factor (or one multi-factor) authentication scheme in your design. You may choose any features in an operating system you want (e.g., login, getting help on a system function, or listing all processes). Your user design will address the following three main security areas:

1. Security authentication scheme/approach with the 2 security factors.
2. Functional requirements supporting the 3 operating system functions.
3. Functional requirements supporting the necessary security policies.

For example, if you design a single-factor login interface, you could develop functional requirements and security policies as outlined below:

1. A user will require a single-factor username and password to be entered to access the application.
    a. Clearly outline the authentication scheme and number of factors required.
2. A username must be a mix of alpha-numeric characters and be 8–10 characters in length.
3. A password must a mix of alpha-numeric characters, 1 upper case, and be 10–15 characters in length.
    a. Clearly outline any data input requirements (length, special characters, etc.).
4. The username and password will be encrypted at rest (when stored on the server).
5. The password will never be displayed as it is being typed or transmitted in clear text.
    a. Clearly outline how a secure "hack proof" design will be achieved.
6. The user will be locked out after three unsuccessful attempts to access the application.
7. The user must rotate their password every 90 days.
8. The user must not reuse their last 10 passwords.
9. The user will not be informed of which authentication factor was invalid.
    a. Clearly outline the security policies that will be supported by your design.

Each feature must outline its functional requirements (*what* needs to be done) and also include a wireframe mockup user interface design and flowchart (logic for *how* this could be done). You should use a tool like draw.io that contains some starter templates to draw your user interface wireframe mockup.

Your requirements and design must be detailed enough such that the operating system function is "hacker proof" and support strong industry security policies as discussed in class lectures and in Chapter 7 of your book.

Deliverables:

1. Cover sheet with your name, the name of this assignment, and the date.
2. For **each** operating system function, provide the following:
    a. Detailed explanation of your interface design choices and how they address the three assignment requirements: authentication scheme, factors, and security policies that will be used.
    b. A table outlining the functional requirements and security policies to secure the function in #2a.
    c. A wireframe mockup user interface that demonstrates how security would be designed for the function in #2a.
    d. A flowchart that demonstrates the logic of your feature and how security would be designed for the function in #2a.
3. Package all of the above into one document and upload it to the digital classroom.