

# Homework 4

**Date Due: October 26th, 2021, by 11:59 PM EST.**

Please read the journal article attached in this week's (Week 8) module on 'A Matrix for Systematic Selection of Authentication Mechanisms in Challenging Healthcare related Environments' and answer the following questions.

1. The paper talks about challenges in using authentication mechanisms in the medical care cycle. What are the four use cases identified by the paper where authentication mechanisms need to be considered?
2. What are the four categories of authentication methods identified by the authors of the paper?
3. What are the six superordinate groups the authors of the paper mapped the requirements collected for authentication to?
4. What do the authors mean when they assign a requirement to a super ordinate group called Reliability? As per the authors, which requirements map to this group?
5. As per the authors, if an authentication mechanism has to work offline, be easily available (as highlighted by the requirement for mass availability of authentication tools), be easily replaceable (as highlighted by the substitutable authentication mechanism), why have an authentication mechanism at all? Do you agree with the authors that an authentication mechanism is still required? Please explain why or why not.
6. The authors of the paper refer to the "NIDAPad", a device presumably used by the ambulance personnel that collects personal patient information which only uses a four-digit code when personnel transfers/shift changes occur. What threats can you identify that might be present with such a mechanism?
7. In section 5.2 of the paper, the authors discuss the security super ordinate group. Which two attack vectors do the authors describe?
8. In Figure 2, which shows the Matrix weights for environment requirements. Which of the environment requirements has really poor coverage for authentication mechanisms? Why?
9. What is the difference between what is shown in Figure 3 vs Figure 4 in the paper? How do you use the matrix?
10. The following paper proposes using brainwaves to perform authentication of identities: <https://www.usenix.org/system/files/sec21fall-arias-cabarcos.pdf>. As per the paper you read above, the authors identified four types of existing authentication mechanisms. Which authentication mechanism would this brainwave based authentication fall under? Why?