

Case Exercise – Software Engineer

Instructions

- You have **7 calendar days** to complete and submit the exercise.
- This test evaluates your design and coding skills
- Make any necessary assumptions, as long as you clearly state all the assumptions made
- Your exercise response will be evaluated for:
 - Conceptual knowledge of data modelling, object-oriented design, test driven development and programming
 - Your ability to understand and solve the problem.
 - Your ability to describe, communicate and document technical solutions.
 - Your ability to manage, prioritize and estimate your time accordingly
 - Your ability to organize and manage releases
 - Your ability to apply modern security best practices
 - Use the programming language/tech stack that you know the best.

Problem Background

Your team is building a secure backend solution to manage health records called MyHealthPass. You are being brought on to design and build the authentication and authorization library. The library should exist as a standalone module or package that can be imported into the MyHealthPass application.

The Chief Technology Officer is the project sponsor, and she is very excited to have you on board. She even went ahead and created an interface for the library for the MyHealthPass team to use as a stub/placeholder in the interim, while you implement it:

Methods	Description
login(username, password)	Logs the user in
register(accountDetails, password)	Creates an account for the user
authenticate(token)	Authenticates the returning user

Table 1: Initial Interface for Authentication and Authorization Library

Nb. The interface can be modified or extended if you think it does not cover all the requirements of the library.

Problem

- i. MyHealthPass should allow users to register and login. Develop the authentication and authorization library to allow MyHealthPass to accomplish this using the above interface as a baseline.
- ii. The library should be published to a git repository (e.g. GitHub, GitLab, BitBucket) with appropriate developer documentation and instructions on how to use the library.
- iii. MyHealthPass processes sensitive health data which requires additional levels of security to meet compliance needs. The Compliance team mandated that the following security requirement to be considered included into the library:
 - 3 failed consecutive login attempts using the same username results in a locked user account for 20 minutes (if exists)

Assumptions

1. You're being asked to only design and build the internal solution to the problems defined above. You do not need to build any web-based APIs to support your implementation. The authentication library should be consumable using coded APIs. The REST and HTTP interface layer is handled by someone else who will be consuming your APIs.

Outputs/Deliverables

- You should describe the data and object model to support the authentication and authorization requirements.
- You should as much as possible enforce modern security best practices
- You should demonstrate a working solution using your own code
 - Note - existing or similar implementations of the requirements for this project may exist (depending on your language or framework of choice), however, you are asked to implement the core functionality yourself for the purposes of this exercise. But other tools to support your implementation such as an ORM is OK.
- You must demonstrate working tests for your implementation.
- You should document and describe how the interviewer should build, run and test your solution.
- You must provide the URL to the git repository containing the library.