Object Oriented Architectures & Secure Development

Applications using JDBC and configuration files

General assignment

- Write an application to manage invoices.
- Each invoice has a unique auto-increment id, a description, a unit price, quantiy, VAT rate and a total price (unit price &times quantity + vat%).

Creating the MySQL database

- Create a new database schema called `invoices-db`, with one table `invoices`.
- Make sure this table contains the necessary columns to store the necessary data in a correct fashion. *Are there attributes that can be derived from other attributes?*
- Create a MySQL user (and associated password) that can only access the `invoices-db` schema and that can only perform `SELECT` or `INSERT` operations on the `invoices` table. *Why is this a good practice?*
- It should be possible to modify the database connection properties without modifying Java classes in your application. Also, make sure that should the config file fall into the wrong hands, the credentials are not readable as clear text.

Creating and using your code

- Create the MySQL connection class and repository.
- Make sure `SqlException`s do not bubble up to the CLI. Make correct usage of the `InvoiceException` class and use logging where appropriate.
- Develop a CLI application to **create** invoices and verify whether they are actually added to the database. It should also allow for the **retrieval** of existing invoices.

- Make sure all application logic is stored in a separate service class (called from your CLI). The CLI should only contain UI related code (Scanners, System.out.println...). *Why do we apply this separation again?*

Extending the application with FXML functionality (challenge)

- Once you are happy with your CLI, create an FXML application with the following functionality.
- Upon launch the screen displays all existing invoices in a list.
- It should also be possible by clicking a button to open a second screen where one can encode a new invoice.
- Make sure when closing the second screen, that the first screen refreshes to show the new invoice as well.
- **Extra challenge**: initially, don't store the database password in the config file. When the application notices the password is not present, the user is presented with a password input dialog and is prompted to complete the password. The password is then encrypted and stored in the file for future use.

General tips

- Apply the various techniques studied during the classes.
- There isn't one "single solution". Make sure you can motivate your choices.
- It is your software, take ownership.