Security:

We would add two types of security to the database, authentication and authorisation.

**Authentication:**

Is used to authenticate that a user have access to the server by submitting their credentials. The server evaluates if the credentials allow access and establishes the identity.

There are two authentication modes, windows authentication and mixed mode. Windows authentication is the default and uses windows as the authenticator. Mixed mode uses both windows authentication and SQL server authentication, the username and password is stored in the database rather than on windows.

In production we are using windows authentication as we have the software and the database on the same computer and are using LocalDB. When we will deploy the software, it will use mixed mode because the database will not be on the same computer as the software and will have multiple users that are not windows accounts. There will be users of the system where we will store a username and a hashed/salted password in the database for authentication.

**Authorisation:**

A role is used to restrict access and control from users, it uses the role to know what the user is authorised to do, what table the user can interact with and what they are allowed to do to those tables. You can give the public role which the permissions that every role will be given, as everyone inherits from this role, it cannot be dropped, added to nor deleted from.

In our system we need to restrict the users (librarians) based on what type of librarian they are. We have five different roles that are needed for the library, Chief librarian, departmental associate librarian, reference librarian, check-out staff and library assistant.

We would use the principle of least privilege to decide what permission(s) each role would be given. As an example, we would give the chief librarian role the permission to add, update, read and delete rows in all tables, they would not be allowed to change or drop the tables. The check-out staff would only be allowed to add to the borrow table.

1. <https://docs.microsoft.com/en-us/dotnet/framework/data/adonet/sql/overview-of-sql-server-security>