Object-oriented programming
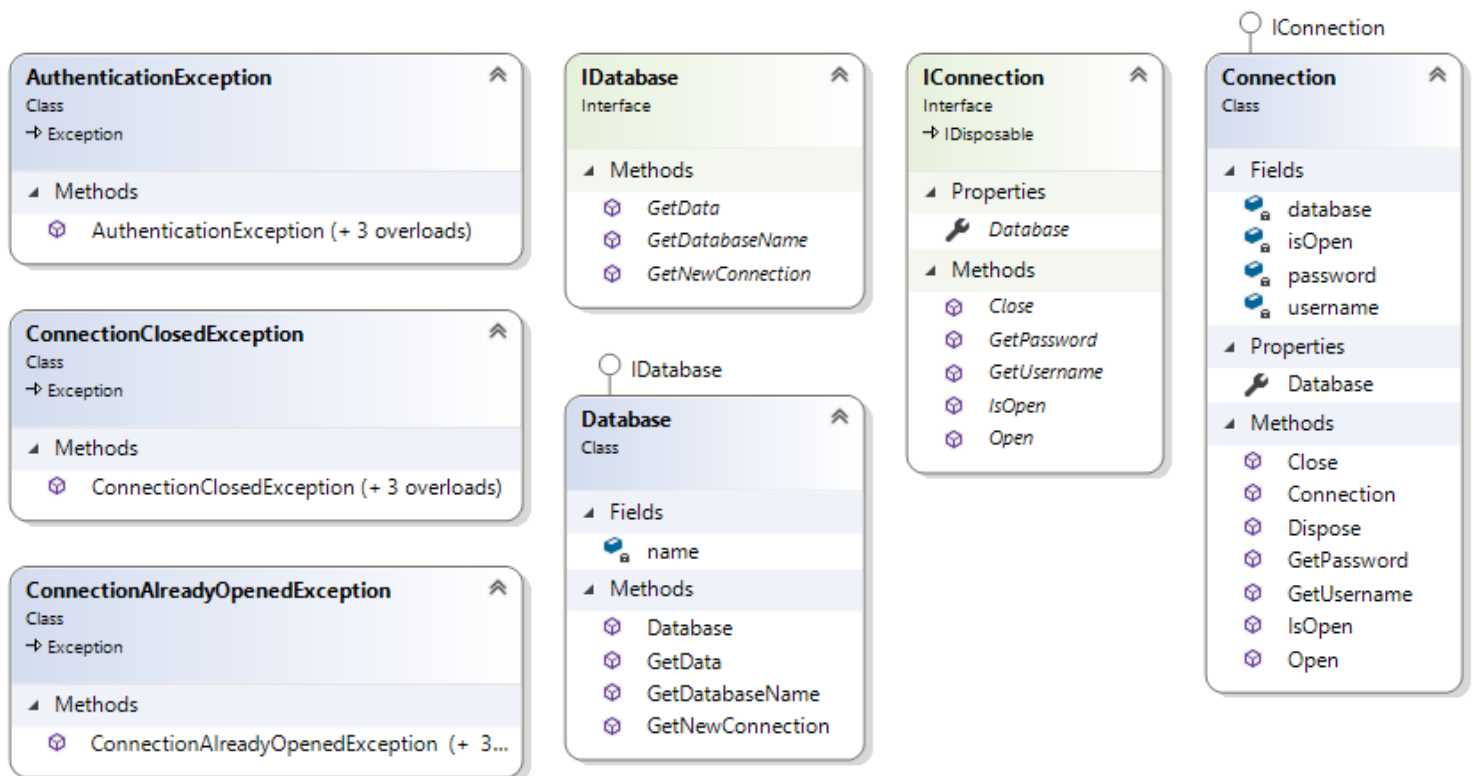
Laboratory classes

Task 4: Interfaces

Individual task

The goal of this task is to create and use a library that will simulate access to the database from the application level.

1. Start the Visual Studio IDE.
2. Create a solution (*Task4*) containing a new class library project and name it *DataAccess*.
3. Download the *IDatabase* and *IConnection* interfaces from the course page and implement them in the *Database* and *Connection* classes, respectively (but do not change the downloaded files).
4. Protect the library against user errors by defining and using appropriate exceptions (entering an incorrect password, attempt to close an unopened connection, attemp to download data without establishing a connection).
5. Create a new application project and test your library. Add the *Person* class [*IdNumber* (int), *FirstName* (string), *FamilyName* (string)] in the application-project, use data downloaded from the database to create a list of persons.
6. Delete people with even *IdNumbers* numbers.
7. Using the *Sort* method of the *List <T>* class, order the remaining people ascending according to *IdNumber*, and then display all information about those people.
8. Try entering the wrong password, retrieve data when the connection is closed, etc.

AuthenticationException
Class
→ Exception

� Methods
  ⊕ AuthenticationException (+ 3 overloads)

ConnectionClosedException
Class
→ Exception

� Methods
  ⊕ ConnectionClosedException (+ 3 overloads)

ConnectionAlreadyOpenedException
Class
→ Exception

� Methods
  ⊕ ConnectionAlreadyOpenedException (+ 3...

IDatabase
Interface

� Methods
  ⊕ GetData
  ⊕ GetDatabaseName
  ⊕ GetNewConnection

◯ IDatabase

Database
Class

� Fields
  ⚬ name
� Methods
  ⊕ Database
  ⊕ GetData
  ⊕ GetDatabaseName
  ⊕ GetNewConnection

IConnection
Interface
→ IDisposable

� Properties
  🔧 Database
� Methods
  ⊕ Close
  ⊕ GetPassword
  ⊕ GetUsername
  ⊕ IsOpen
  ⊕ Open

◯ IConnection

Connection
Class

� Fields
  ⚬ database
  ⚬ isOpen
  ⚬ password
  ⚬ username
� Properties
  🔧 Database
� Methods
  ⊕ Close
  ⊕ Connection
  ⊕ Dispose
  ⊕ GetPassword
  ⊕ GetUsername
  ⊕ IsOpen
  ⊕ Open

○ IComparable

Person
Class
�

▲ Properties
  🔧 FamilyName
  🔧 FirstName
  🔧 IdNumber
▲ Methods
  ⬡ CompareTo
  ⬡ Person
  ⬡ ToString