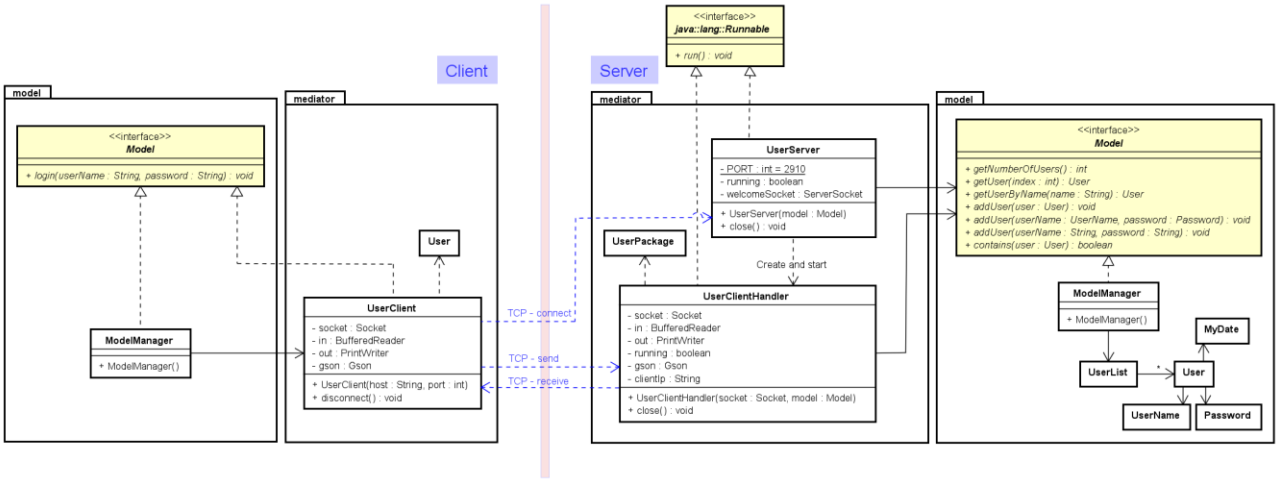
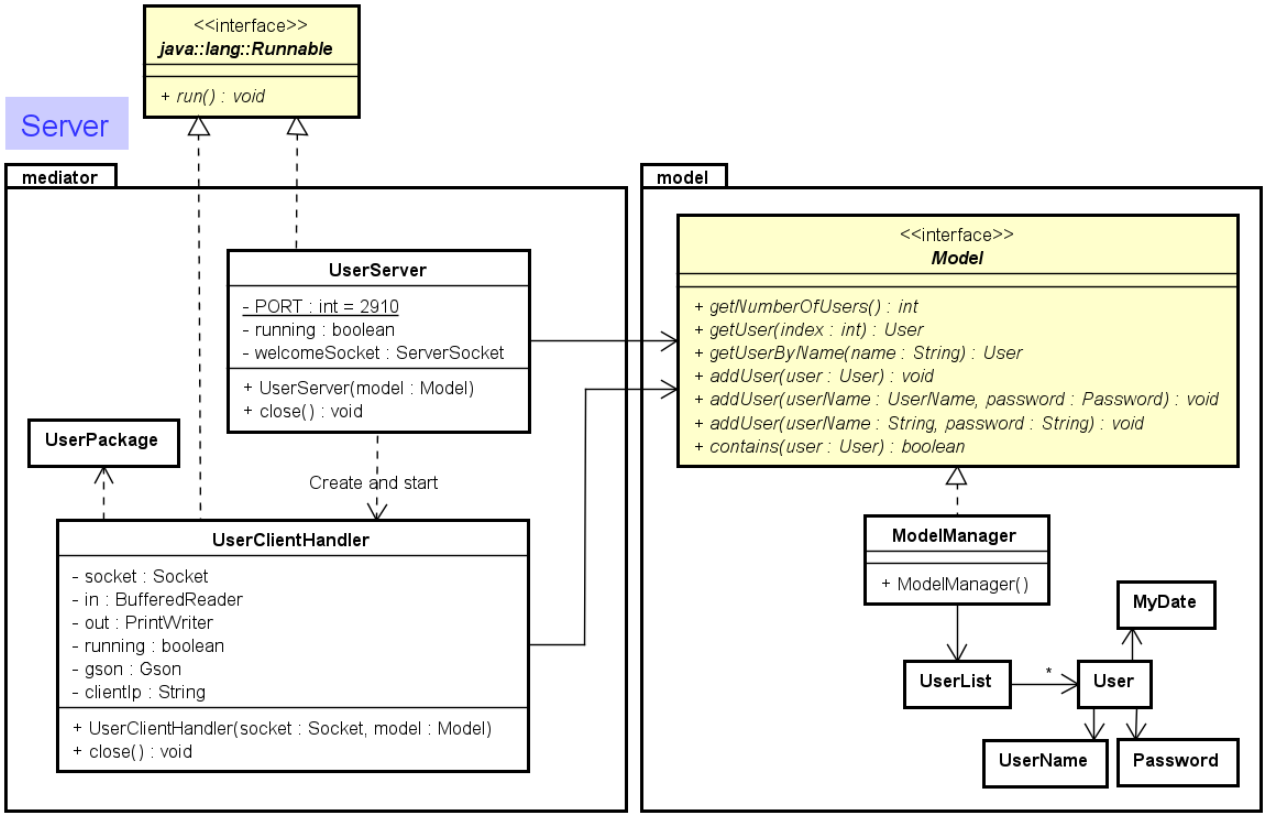
Exercise: A login using server and client model

The purpose for this exercise is to implement a program to login from a client application onto a server application. The program is a simple console version having a server model and an empty client model and using JSon to send login objects from client to server containing username and password.



Step 1: Server side

This server-side application looks like this:



A few comments to the server side application

- Model package is given (uploaded). The interface contains methods to add and get logged in users. A user contains username and password and a timestamp when created / logged in. Adding a user may

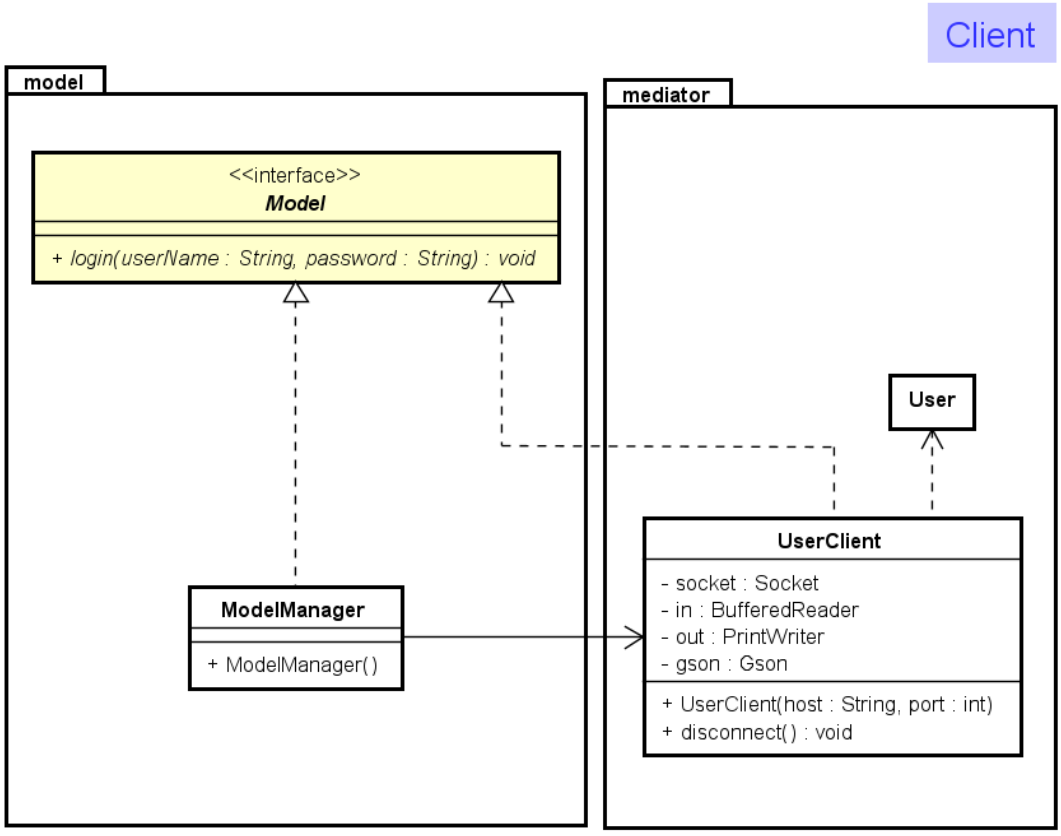
throw exceptions if username or password do not follow some requirements, or if a user with the same username is already in the list.

- Class `UserPackage` is a class containing a username and password as simple Strings – to be used when converting from Json what the client is sending, when trying to login (be added to list). This class is also given.
- Classes `UserServer` and `UserClientHandler` are the two classes to implement.
- Class `UserServer` implements `Runnable` and in its `run` method it has an infinite loop waiting for connecting clients. When a client is connected, an object of `UserClientHandler` is created, a thread is created with this object, and the thread is started.
- Class `UserClientHandler` is handling the communication with one client. It also implements `Runnable` and its `run` method do the following:
  - Read a (JSon-)string from the client [*Note: You have to add gson library/jar to the IntelliJ module*]
  - Convert the JSon string to a `UserPackage`
  - In a `try-catch` block call the model method addUser(String, String). If success, send the string "`Success: you are now logged in`" to the client, if in catch block, then send the exception message instead.

  Try to implement the method with proper printouts, exception handling and controlled client termination.
- Create a class with a `main` method in which 1) create the model and 2) create and start a Thread with a `UserServer` object, i.e. starting the server.

Step 2: Client side

Create another module in IntelliJ to the client-side application. The client-side application looks like this:



A few comments to the client side application

- `Model` interface is given (uploaded). Note that is has the same name as the interface on the server side. Therefore, you should create the client and server in different IntelliJ modules.
- Class `User` (also given) is in contents and variable names identical to `UserPackage` on the server side. The idea is to send a `User` object converted to JSon, (and the part you already made: convert it back on the server side to a `UserPackage` object).
- `UserClient` implements the `Model` interface (like `ModelManager` does). In `UserClient` constructor you connect to the server and in the `login` method you:
  - Create a User object, convert it to a JSon string and send this to the server [*Note: You have to add gson library/jar to the IntelliJ module*]
  - Receive a string from server (if this was the type you were sending from server)
  - If the string do not start with “Success” or you catch an exception, then throw an exception with a proper message (in most cases, use the result from server).
- Class `ModelManager` implements the `Model` interface and in the `login` method, you delegate to the `UserClient` instance variable.
- Create a class with a `main` method in which you get username and password from keyboard and call the `login` method from the model. Continue asking for the two strings until you call the `login` method without catching an exception. If an exception is caught then print out the message.