

Distributing Systems & Co-Operative Computing

RMI Assignment 1

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Initializing Server and the RMI Registry Setup

The server was compiled and executed and the console confirmed that the RMI registry was created, and the remote object was bound successfully on the port 1099.

```
"C:\Program Files\Eclipse Adoptium\jdk-21.0.5.11-hotspot\bin\java.exe" "-javaagent:  
Server is running and ApplicationService is registered.
```

Successful Login, Session ID and Application Form

The client was run and valid credentials (username: "ayodeji", password: "ali") were entered, this resulted in a successful login with a session ID displayed.

```
public class ApplicationHandlerImpl extends UnicastRemoteObject implements ApplicationHandler { 1 usage  
    private HashMap<Long, String> activeSessions; 4 usages  
    private final String VALID_USERNAME = "ayodeji"; 1 usage  
    private final String VALID_PASSWORD = "ali"; 1 usage
```

After the user was logged in, the client downloaded the application form and iterated it through the questions, accepting the users' inputs using the command line.

```
"C:\Program Files\Eclipse Adoptium\jdk-21.0.5.11-hotspot\bin\java.exe" "-javaagent:  
Enter Username: ayodeji  
Enter Password: ali  
Login successful. Session ID: 1738530141450  
University College Application Form (Version 1)  
Question 1: Full Name:  
Ayodeji Ali  
Question 2: Address:  
33 Ardcairn House  
Question 3: Email:  
Barnicleboy123@gmail.com  
Question 4: Contact Number:  
0811234567  
Question 5: Personal Statement:  
I love University of Galway, Computer Science  
Application submitted successfully.  
  
Process finished with exit code 0
```

Submitting Form and Saving the File

The completed form was submitted from the client, and the server saved the application data to a text file, this was confirmed by the server's console output.

```
1 Application Summary:
2 Full Name: Ayodeji Ali
3 Address: 33 Ardcairn House
4 Email: Barnicleboy123@gmail.com
5 Contact Number: 0811234567
6 Personal Statement: I love University of Galway, Computer Science
7
```

```
"C:\Program Files\Eclipse Adoptium\jdk-21.0.5.11-hotspot\bin\java.exe" "-javaagent:
Server is running and ApplicationService is registered.
User logged in successfully. Session ID: 1738530141450
Application form downloaded for session: 1738530141450
```

Invalid Login Handling

Incorrect credentials were entered during testing, which triggered and InvalidCredentialsException and displayed an error message.

```
"C:\Program Files\Eclipse Adoptium\jdk-21.0.5.11-hotspot\bin\java.exe" "-javaagent:
Enter Username: ben
Enter Password: teke
Error: Invalid username or password.

Process finished with exit code 0
|
```

InvalidSessionIDException

There are 3 test cases.

If the sessionID is negative an exception is thrown, if the sessionID is in the activeSessions Map it'll create and return a new application form and if not it'll throw an exception and if the sessionID is not in activeSession it throws an error to ensure you can't submit the form.

```
@Override 1 usage
public void submitApplicationForm(long sessionId, ApplicationForm form) throws RemoteException, InvalidSessionIDException {
    if (!activeSessions.containsKey(sessionID)) {
        throw new InvalidSessionIDException("Invalid session ID.");
    }
}
```

```
@Override 1 usage
public ApplicationForm downloadApplicationForm(long sessionId) throws RemoteException, InvalidSessionIDException {
    if (!activeSessions.containsKey(sessionID)) {
        throw new InvalidSessionIDException("Invalid session ID.");
    }
}
```

```
@Override 1 usage
public void submitApplicationForm(long sessionId, ApplicationForm form) throws RemoteException, InvalidSessionIDException {
    if (!activeSessions.containsKey(sessionID)) {
        throw new InvalidSessionIDException("Invalid session ID.");
    }
}
```

Overall Observations and Conclusion

The tests confirmed that the system properly handles valid operations and error conditions, this includes correct file saving and error messaging.