Atlassian Java Developer Coding Test

Welcome to the Atlassian Java Developer Coding Test. You have been provided with source code (with some test cases) for a "user management" system. It contains Users, Groups and Memberships.

Your interviewer is available to answer any questions that you may have; just ask. If they truly cannot answer your question, they will let you know.

Please read this document, load the source code in your favorite IDE and browse the source. Do not start working on the problems until your interviewer joins you.

Question 1

In this question we would like you to find and fix the issues in the implementation of the users and groups codebase.

Part A

The documentation in MembershipService suggests that trying to remove a user from an already empty group will simply be ignored. Write one or more tests to verify that this works as expected.

Part B

Your users and groups code is being used in the wild and your users have started raising issues. Read and solve the following issue:

Users and Groups / UG-1

I created a group and there were already users in the group!!!

Details

Type:	🔲 Bug	Status:	**TO DO** (View Workflow)
Priority:	↑ High	Resolution:	Unresolved

Description

I'm a new administrator of your app, I took over from the old person. The users and groups were a mess and I have been deleting and creating groups to clean it up. However, today I just recreated a group called "app-users" and then I went to add people to that group. However, to my surprise, there were already users in that group!!! This is clearly a bug and should never happen. I expect my groups to be empty when I create them.

Part C

Your users and groups code has also been made avaliable to software developers. Read and solve the following issue:

Users and Groups / UG-2

User not in group after being added to group

Details

Type:	🟥 Bug	Status:	TO DO (View Workflow)
Priority:	↑ Medium	Resolution:	Unresolved

Description

I'm a developer and I used the MembershipService to add the user 'alex' to the group 'staff' but now the app is telling me that the user is not a member of the 'staff' group. However, when I then list the users inside the 'staff' group I can see that the user 'alex' is present. What is going on?

Question 2

This codebase allows nested groups; groups that are members of other groups. However, this has not been implemented fully yet. Go through the codebase and make changes as needed to finish the nested groups support.

Please also ensure that there is appropriate test coverage for your newly added feature.

Question 3

You have recently been told that some users seem to be experiencing odd problems using this code. Occasionally, especially under high load with many users, the code does not seem to work as expected.

Please modify the implementation to make it thread-safe. You may refactor the code and change its data structures as needed.

Bonus: Either write or describe how you would test your implementation.