Bison’s AP\_CSA Homework8 Write-up

1. Overview

In this homework, you are required to implement a chatting system. In the chatting system, you are required to write java class for User and Chatroom. You will have a more thorough understanding of object-oriented programming in java by completing the homework. To get started, **remember to put all java files into one separate folder.**

1. Important note

Please **DO NOT** send this homework write-up or code to **ANYONE** without Bison’s permission. The contents are all create originally by Bison. The idea of the homework is from the third assignment of the course “DSC 30” at UCSD.

1. Class Architecture

There are 5 java files in the assignment: User.java, StandardUser.java, PremiumUser.java, ChatRoom.java, and Client.java. You are required to write the first 4 classes. The Client.java is already implemented for you for the test purpose.

* 1. **ChatRoom.java**

You have two list instance variables in the class. You will need to initialize them to arraylist. The user\_list is used to store all the users that are in the chatroom. The log is used to store all the chat history that happened in the chatroom.

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The **addUser** method add the given user to the chatroom’s userlist.



It also adds the following message to the log (chat history):

If User is a standard user: “Username join the room.” The Username should be replaced by the username of the user when adding to the log.

If User is a premium user: “Welcome Premium User Username join the room!” The Username should be replaced by the username of the user when adding to the log.

Hint: you can use the following method to identify the type of user: 

The **removeUser** method remove the given user from the chatroom’s userlist.



It also adds the following message to the log (chat history):

“Username leave the room.” The Username should be replaced by the username of the user when adding to the log.

The **addLog** method add the message sent by some user to the log instance variable (log)



For example if the user’s username is Bison, and the message is “hello”, you should add “Bison: hello” to the log.

The **showLog** method print out all the chat history in the log



You first print out “The followings are chat history:” Then you print all String in the log in each line.

* 1. **User.java**

This should be an abstract class. Standard User and Premium User should be the subclass of User.



You should have two instance variables. One is username, and the other is user\_room that indicate which chatroom the user is in.



The constructor is for you to initialize username to the given username. The user\_room should be initialized to null.





These two getter method just allow you to access the instance variable.



The JoinChatRoom method let you join the current user to the given room. You set the user\_room instance variable to the given room and add the current user to the user\_list of the given room. You also need to print out “Username join the room” where the Username should be replaced by the current username.



In the quit chat room method, you should remove the user from the chatroom’s userlist and set the reference of the room of current user to null. You should also print out “Username leave the room” where the Username should be replaced by the current username.

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You should also have two abstract method that should be overridden by the subclass.

* 1. **StandardUser.java**



You need to call super to initialize the constructor.



In the method send random message, you should add the String “I'm a standard user” to the log of the chatroom where the current user is in by calling addLog method of the chatroom. You should also print out “Username sent a message” where the Username should be replaced by the current username.



In the method sendMessage, you should add the given String message plus “(Standard)” to the log of the chatroom where the current user is in by calling addLog method of the chatroom. For example, if the standard user Bison sent a message “Hi”, you should add “Bison: Hi (Standard)” to the log. You should also print out “Username sent a message” where the Username should be replaced by the current username.

* 1. **PremiumUser.java**

PremiumUser class is very similar to the standard user. The only difference is that you should add the String “I'm a premium user” to the log when calling SendRandomMessage and plus (Premium) in the sendMessage method. For example, if the premium user Bison sent a message “Hi”, you should add “Bison: Hi (Premium)” to the log. You should also print out “Username sent a message” where the Username should be replaced by the current username.

* 1. Client.java

You don’t need to change anything in the class, the class is for your test purpose.

The following are codes and expected output:

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Notice that you don’t need to and should not test all code in once. You can always comment out some parts and test particular method in each step.

**Good luck and happy coding!**