CS356 Object-Oriented Design and Programming
Programming Assignment 2 - Mini Twitter

Due Date

Tuesday 1:00PM, November 8, 2016

Score

50

Problem Description

In this programming assignment, you will build a Java-based Mini Twitter with graphical user interface (GUI) using Java Swing. This is going to be a pure desktop program, without web or mobile components. The goal of this assignment is to let you experience how to apply design patterns to build extensible software systems.

The basic functions of the system include:

1. There is a centralized admin control panel to create **users** and **user groups**.
2. A **user** has 1) an unique ID; 2) a list of user IDs that are following this user (followers); 3) a list of user IDs being followed by this user (followings); 4) a news feed list containing a list of Twitter messages.
3. A **user group** has an unique ID, which can be used to group users. A user group can contain any number of users. The same user can only be included in one group. Of course, a user group can contain other user groups recursively. There is always a root group called *Root* to include everything.
4. Users can choose to follow other users (not user groups) by providing the target user ID. Unfollow is not required.
5. Users can also post a short Tweet message (a String), so that all the followers can see this message in their news feed lists. Of course, the user can also see his or her own posted messages.
6. A few analysis features are needed in the admin control panel: 1) output the total number of users; 2) output the total number of groups; 3) output the total number of Tweet messages in all the users' news feed; 4) output the percentage of the positive Tweet messages in all the users' news feed (the message containing positive words, such as good, great, excellent, etc.) Free free to decide the positive words.

You need to build a GUI for the functions above. The suggested UIs are shown below. The figures should be self-explaining. A few notes are:

1. All the UIs and layouts are just the suggested design for you to use. You can re-design any of these as long as the functions are supported.

2. The Admin Control Panel is the main UI you will see by running the program. This should be the entrance to the program.
3. You can add users/groups with Buttons and TextAreas. Of course, the TreeView should be updated as well whenever new users/groups are being added.
4. For groups, you should display them with a different notation (maybe a folder icon or something else just to distinguish it from the users).
5. Deleting users/groups is not required.
6. Clicking on the 4 buttons at the bottom-right will output the correspondent information. You can simply popup a dialog to display the value, or use some other widgets.
7. When you select a user in the tree, clicking on the Open User View button will open the User View as shown in Figure 2. You can open multiple User Views for different users.
8. In the User View, it will display the current users you are following in a ListView (followings). You can add new users to follow by using the TextArea and Button. Unfollow is not required. Displaying your followers is not required.
9. The User View also shows the current news feed list for this user in a ListView.
10. You can post a new Tweet with the TextArea and Button. Once you click the Post button. It will add the message to all your followers' news feed list, as well as your own news feed list.
11. Whenever a new message is posted, all the followers' news feed list view should be updated and refreshed automatically.

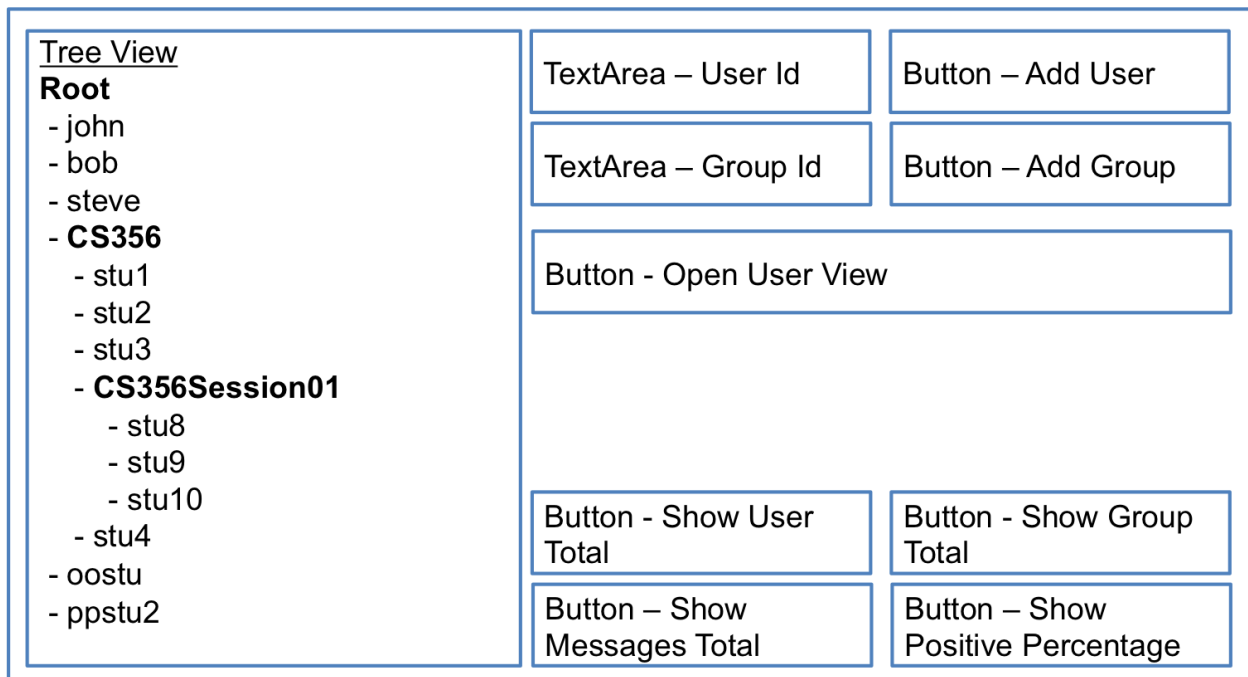| Tree View		
Root	TextArea – User Id	Button – Add User
- john		
- bob	TextArea – Group Id	Button – Add Group
- steve		
- **CS356**	Button - Open User View	
- stu1		
- stu2		
- stu3		
- **CS356Session01**		
- stu8		
- stu9		
- stu10	Button - Show User Total	Button - Show Group Total
- stu4		
- oostu	Button – Show Messages Total	Button – Show Positive Percentage
- ppstu2		

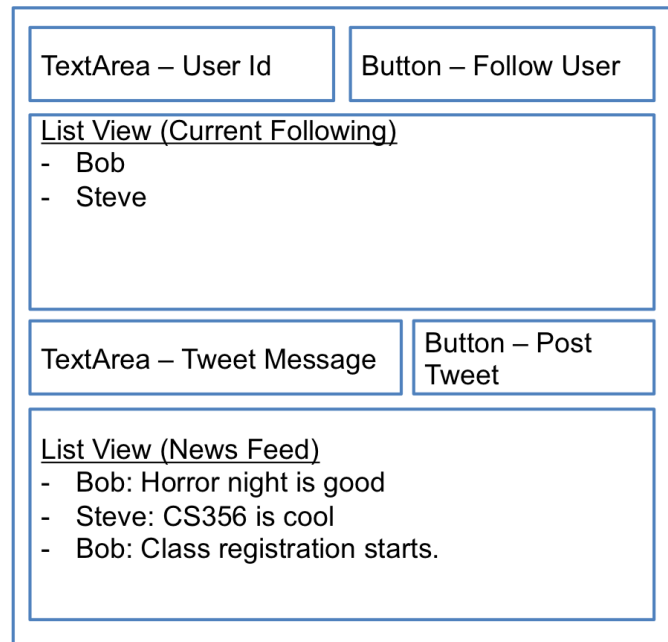Figure 1. The UI for admin control panel
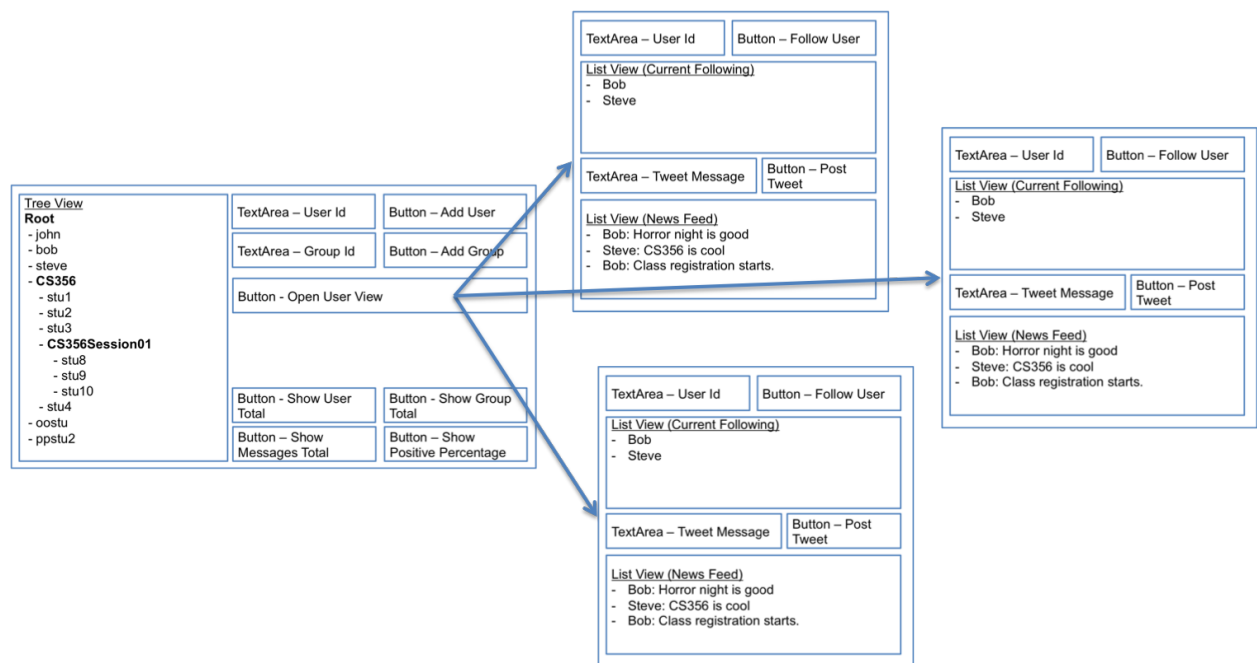
Figure 2. The UI for user view

Figure 3. You can open as many user views as you want by selecting the user in the tree and clicking on the Open User View button

The UI should be built using Java Swing. There are tons of references and tutorials about how to write Java Swing program. For instance, http://docs.oracle.com/javase/tutorial/uiswing/.

You are encouraged to use as many design patterns as you can (even using the one we have not covered in the class). The required patterns are **Singleton, Observer, Visitor, and Composite**.

Your program should contain a `Driver` class with a `main()` method to trigger the Admin Control Panel.

As usual, this programming assignment is very open. For the details that are not clearly specified above, feel free to make your own design decisions, but you should always clarify your decisions in your code with comments. Also, you can email me to for any clarification about the requirements.

Submission Directions

Everyone should submit your assignment (checkin your code) through GitHub. You should use your own GitHub account, and create a project repository for your own assignment. To submit your assignment, simply send an email (to both yusun@cpp.edu and yuchinghsu@cpp.edu) about your project repository link, and I will go to your repository to check your changes and commits.

Note: You need to create a new repository for Assignment 2 (don't reuse the repository for Assignment 1).

Getting Help

Please let me know if you need to meet to discuss any problems that you may have.