Computer Science 3620
Assignments 2 & 3 - TwitterLite[1]
(Teams of 2 or 3 are encouraged)

Problem Description

This assignment requires you to design and implement a mini version of Twitter, complete with graphical user interface (GUI). The program must be implemented using Java and Swing. Your implementation will be a desktop application with no web, network or mobile components. The purpose of the assignment is think about and apply design patterns to build an extensible software system. The basic elements of the system include:

1. 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. 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), for all followers to see in their news feed lists. Of course, the user can also see his or her own posted messages.
6. The admin control panel also needs to show these summary stats:
    1. Total number of users;
    2. Total number of groups;
    3. Total number of Tweet messages in all the users' news feed;
    4. Percentage of the positive Tweet messages in all the users' news feed (the message containing positive words, such as good, great, excellent, etc.). You can decide what the positive words are.

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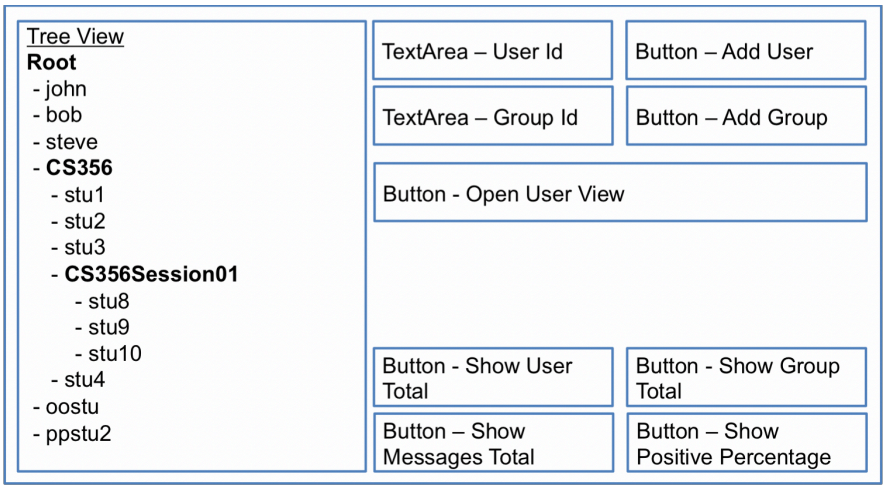
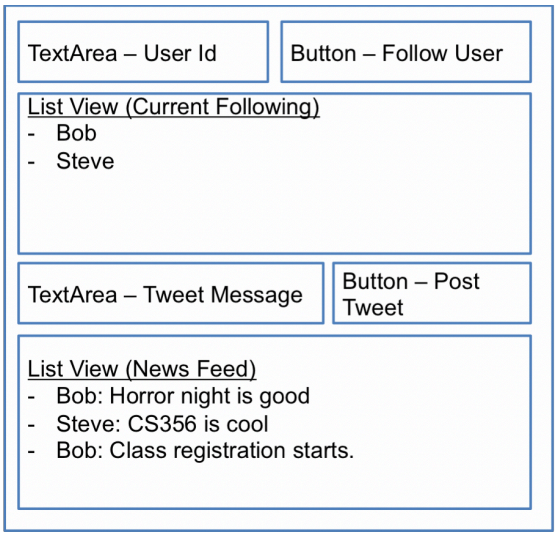
[1] Adapted from an assignment created by Dr. Yu Sun at Cal Poly Pomona

The user interface for the Admin Control Panel might look something like this:



And the user interface for the User View might look like this:



Here are a few notes about the user interface:

1. These UIs are just suggestions. You can redesign them as long as the required functions are supported.

2. The Admin Control Panel is the main UI that is seen when the program is run.

3. You can add users/groups with Buttons and TextAreas. The Tree View should be updated as well whenever new users/groups are being added (you might explore the JTree swing component for this).

4. Display groups with a different notation (e.g. a folder icon to distinguish from the users).

5. You do not need to handle deletion of users or groups.

6. Clicking the 4 buttons at the bottom right of the Admin Control Panel will display the correspondent information (you can simply popup a dialog to display the value)

7. When you select a user in the tree, clicking on the Open User View button will open the User View. You can open multiple User Views for different users.

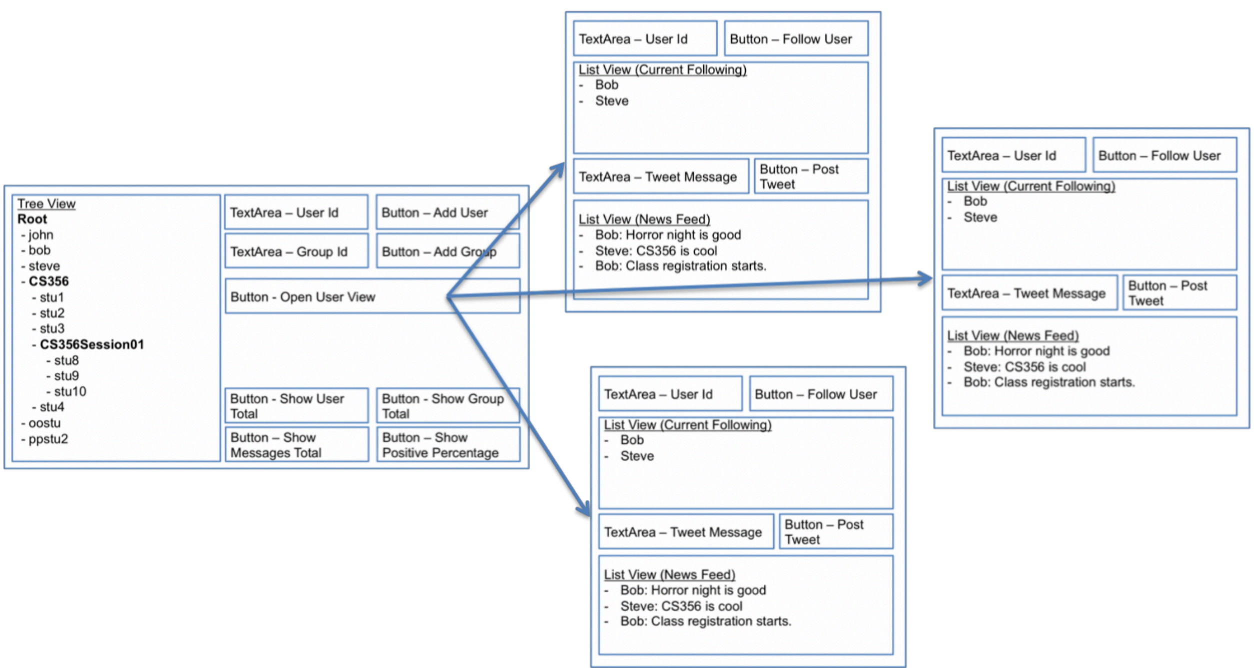
8. The User View will display the current users you're following in a List View. You can add new users to follow by using the TextArea and Button. Unfollow is not required. Displaying your followers is not required.

9. The User View also shows the current news feed list for this user in a List View.

10. You can post a new Tweet with the TextArea and Button. Once you click the Post button, it adds the message to all your followers' news feed list, as well as your own news feed list.

11. Whenever a new message is posted, the news feed list view for all the followers' should be updated and refreshed automatically.

The figure below illustrates that 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



You are encouraged to use as many design patterns as you think are appropriate. (even ones we haven't formally covered). 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.

What to submit:

This assignment is really two assignments rolled into one. You are encouraged to work in teams of 2 or 3 (team composition is up to you). Your Assignment 2 grade will be based on your design as communicated through a design document. The Assignment 3 grade will be based on your implementation of that design.

Please submit a single zip file containing the following:

- AS2: A design document, in PDF format, that includes:
    - An explanation of, and justification, for the design patterns employed
    - A UML diagram of your system
    - Descriptions of the participants in the UML diagram
- AS3: A single BlueJ project folder containing your program. The code must be properly commented: Use javadoc comments for classes/interfaces and public methods, and use inline comments elsewhere. Run javadoc to produce the HTML documentation. The README file should contain a description of challenges/weaknesses/known bugs and any instructions that are needed to operate the program (things that aren't completely obvious).

Make sure you include the names of all team participants.