

## Midterm 2 (Take-home)

Total Points (50 pts)

Due: 7<sup>th</sup> March (10 PM)**No late submissions accepted**

## Question 1 (15 pts)

- a) Design and implement a GUI to represent a **TrafficLight**, with a Window and the following components: A button (that is not clickable) that represents the traffic light (we will refer to it as *trafficLightButton*) and a label to show its location. The default color of the *trafficLightButton* should be RED. Add another button with the label, CHANGE. When this button is clicked, the color of the *trafficLightButton* should be changed.

## Question 2 (35 pts)

- a) Define a class called **ClubMember** with data members, *first name*, *last name* and *age*.  
b) Define a class called **Club** with the data member, *memberList* (either an array or ArrayList of ClubMembers).  
c) Define a method called *addMember* (ClubMember *member*) that takes an instance of ClubMember as a parameter and adds it to the *memberList*.

**Note:** You are free to define any other methods you may find necessary.

- d) **Design and implement a GUI with the following features:**

- The GUI should have a Window with label called **Club**.
- It should have a **text area** to show the results.
- It should have **two buttons**, one with the label, **ShowByLastName** and a second button with the label, **ShowByAge**.
- When the button, **ShowByLastName** is clicked, all the member names with lastname, firstname, age (**sorted** in ascending order by **last name**) should be displayed in the text area.

For example,

**Smith, John 21**

**Tran, Adam 18**

- When the button, **ShowByAge** is clicked, all the member names with lastname, firstname, age (**sorted** in ascending order by **age**) should be displayed in the text area.

For example,

**Tran, Adam 18**

**Smith, John 21**

**Test case:**

- a) Create an instance of Club in main() and add at least 10 members to the Club instance. In your code, you have to connect the Club instance with the GUI window.
- b) Now, pop up the GUI and test using the two buttons. You may want to capture the screen shots and include along with your source code.

**What to submit:**

**Create a zip file (name it with your first initial and lastname) with the following**

- a) Your **.java** files.
- b) Screen shots
- c) An executable jar file ([Creating a Runnable Jar file](#))

**Extra points:** An extra 5 points for easy to use and attractive interfaces (for Q1 and Q2).