

# COMP 132: Advanced Programming

## Spring 2022

### Programming Project

Due: 18.05.2022, 9:00 pm (Late submissions will not be graded.)

## Social Media Network with GUI

This is an individual programming project. All work should belong to you. For any question regarding this Programming Project, you should use the corresponding Blackboard discussion forum and post your questions there.

You must include and sign (by writing your name and student id number) the following **Pledge of Honor statement** at the beginning of your main method source code file. Otherwise, your project will not be graded.

/\* Pledge of Honor \*\*\*\*\*

I hereby certify that I have completed this programming project on my own without any help from anyone else. The effort in the project thus belongs completely to me. I did not search for a solution, or I did not consult to any program written by others or did not copy any program from other sources. I read and followed the guidelines provided in the project description.

READ AND SIGN BY WRITING YOUR NAME SURNAME AND STUDENT ID

SIGNATURE: <Name Surname, Student id>

\*\*\*\*\*/

**Blackboard submission:** You should submit one \*.zip file with your <name-surname> (for example Ayse-Yilmaz.zip) that contains the whole **Java project folder** and **a report file as a PDF**. The report should be written in two parts. The first part should be a guideline describing the execution steps of your application. In the second part, you need to describe your project design, implemented types, graphical user interfaces and references of the resources you have used.

Please note that the report grade is part of your project grade. You should prepare it as clearly as possible. There is no page limit for the report.

**Bonus:** The top projects that have the best GUI design, the most efficient implementation, and the best demonstration will get bonus points.

# Project Overview

In this project, you are expected to put your object-oriented programming (OOP) and Java Swing skills to design a graphical user interface (GUI) based social media application. The application manages information about users, groups, and content. It should contain multiple frames: a frame for the login page, and a frame for the main application that displays the content, user profiles, and groups.

The project is different from the labs. In the labs, we gave you exact instructions. In the project, the objective is to do large scale programming, apply OOP concepts you have learned, and do research on Swing GUI and practice GUI programming. We provide some general constraints and leave the implementation details up to you. You are expected to write a large-scale Java application from scratch. You are expected to study the Swing API, and use its GUI components on the design and implementation of your application.

This document is a guideline to describe some of the design choices, while you will decide on the implementation. You should use software practices such as type hierarchies, abstraction, code cleanliness, and documentation in your work.

This is an individual project. You can use the provided course materials. You can discuss concepts with the TAs and your friends, but **cannot** share code. The project code you submit **must** belong to you. You are not allowed to copy-paste code from anywhere. If you'd like to use a UI designer tool, you are expected to be aware of what all of the code does, you must describe how you used the designer in your report, and explain in the source code and during the project demonstration. Any violation of the rules stated in the project description will not be tolerated and disciplinary action will be taken.

In the remaining sections, we describe the project and specify its constraints. You should make your own decisions for anything that is not specified.

## User

Users interact with the application. Each user has a unique nickname, password, real name and surname, age, and an email address. They can optionally have a profile photo and hobbies. If a user does not have a profile photo, a default profile photo must be displayed.

Users can search other users and groups, follow other users, unfollow users, join groups, leave groups, post content to group pages or their personal page.

They can search posts by title inside a group page, and a user page they follow.

They can delete the posts that they created. They can change their personal information with the exception of their nickname. They can delete their account and they can ask the

app to suggest friends and groups.

Users can either be Standard or Premium. In addition to standard, premium users can create groups, delete groups they created, and remove users from groups they created.

## Content

Users can create Content where they can write text and post images. A Content has a **unique** title, time of creation, author, and can contain both text and an image. The creator of a content can edit it to insert or remove text or the image.

(Hint: for images, you can use `Java.Swing.JFileChooser` or `Java.awt.FileDialog`)

## Homepage

You can view this as any “homepage” of a social network you are familiar with. A user sees the homepage after they log in and it displays contents that are created most recently by users they follow and the groups they are in. Each content includes the nickname, real name and surname of the creator, title and time of creation, content text and content image if it has any.

The logged in user can also create new content that will be posted on their profile page.

In addition, the logged in user can search for other users (by nickname), groups (by group name) and access the corresponding pages for the user or group.

The logged in user can also access their own profile from the homepage.

## Profile Page

Every user has a profile page where their profile photo, nickname, real name and surname, and their account type – standard or premium – are always displayed. The profile page behaves differently in the following 3 scenarios based on the logged in user:

### 1. When you are displaying the profile page of a user you do not follow:

Profile page displays only the nickname, real name and surname, the profile photo and their account type. As well as an option to follow.

### 2. When you are displaying the profile page of a user you follow:

Profile page displays all information displayed to non-followers, and it also displays friends, groups, and contents of the user. As well as an option to unfollow.

### **3. When you are displaying your own profile:**

Profile page displays your friends, your groups, and content you posted.

In addition, there are utilities allowing you to create new posts in your profile page, change your personal information except your nickname, log out of your account, delete your account, and a utility to ask the app to suggest users to follow and groups.

If you are a premium user, your profile page should also have an option to create a group.

“Suggest users” should list at least five users who are most similar to you based on the following criteria:

- From the same country
- Have the same hobby
- Difference in age is at most 5 years (older or younger).
- Not currently followed

“Suggest groups” should list at least 2 groups that you are not a part of based on your similarity to each group’s country and hobbies.

## **Group and Group Page**

A group is a gathering of users with similar interests to share their content with each other conveniently. Each group has a name, country it is based on, and hobbies as specified by the group creator. The group page also lists its member users and the contents posted to the group page by members. The group page behaves differently in the following 3 scenarios based on the logged in user:

### **1. When you are not a member of the group:**

Group page displays the name of the group, the country it is based on, hobbies, and an option to join the group.

*Note: Implementing the concept of “request to join a group” isn’t expected. Therefore, an implementation that a user joins and leaves groups instantaneously would suffice.*

### **2. When you are a member of the group:**

Group page displays all information displayed to non-members, an option to leave the group and a list of members and the creator of the group.

In addition, the page shows contents posted to the group by the members.

There should also be utilities to post new content, and edit and remove existing content that you posted.

### 3. When you are the creator of the group:

In addition to the group page for members, you have options to remove members and to delete the entire group.

## While developing your project, you should:

- Apply object-oriented programming concepts such as polymorphism, inheritance, type hierarchies, exception handling, and string processing.
- Adhere to the principle of least access when designing your code.
- Make good use of the Java Collections framework.
- Use Java Swing GUI components to build your graphical user interface.
- Write clean code with good comments. Feel free to structure your code however you like, but clearly explain what everything does.
  - Explain what each method does, what the method's parameters are, and what method returns.
  - You can also use Javadoc for documentation:  
<https://www.oracle.com/java/technologies/javase/javadoc-tool.html>
    - Hint: you can have your IDE generate a documentation string (docstring for short) template by typing `/**` above a method declaration and hitting enter.

```
/**
 *
 * @param firstArgument
 * @param secondArgument
 * @return
 */
int example (int firstArgument, int secondArgument) {
    return 0;
}
```

**Note:** Please note that not providing sufficient documentation will lead to great grade reduction, even if your code is perfect.

**You can add other classes or GUI frames if you think there is a need for them.**

Design and implement a Graphical User Interface using the **Java Swing Framework**. You can use components such as **JTextField**, **JButton**, **JComboBox** and **JOptionPane** to design your GUI. You are free to use any layout and panel but your **GUI** should be easy to understand and use.

**In order to meet the project demo requirements, you should *at least* have:**

- 12 users (at least 4 premium and 8 standard users)
- 3 followed users for each user
- 4 contents for each user (at least 1 for each group they're in, at least 1 that contains an image)
- 4 groups
- 3 users per group

During the **demonstration** of your project, you should show the execution of the following operations via your **Graphical User Interface**. You will need to demonstrate the usage of your application as both a standard user and a premium user.

## **Operations to demonstrate in the GUI**

**In the login page:**

- Sign in existing users with the nickname and password,
- Sign up for new users.

Once you sign in as a user:

**In the homepage:**

- Display the contents created by users you follow,
- Display the contents of the groups you joined,
- Search users and groups,
- Search for contents using their titles from the users you follow and groups you joined,
- Create a new content with or without images,
- Access Profile Pages or Group Pages via search.

**In another user's profile page**

- Display that user's information,
- Follow that user,

- Unfollow that user,
- See the content that the user posted.

### **In your profile page:**

- Display your information,
- Display, edit, remove the content you created,
- Display users you follow and groups that you are a member of,
- Suggest users to follow and groups to join,
- Modify your profile information except your nickname,
- Log out of your account,
- Delete your account,
- As a premium user:
  - Create a group.

### **In the Group Pages:**

- Display the group information,
- Join the group,
- Leave the group,
- Display the content the group members posted,
- Display the group creator and members,
- Modify or delete content that you posted,
- As a group owner:
  - Remove any member of the group,
  - Delete the group.

**Good Luck!**