

**COMP-132: Advanced Programming**

**Programming Project Report**

PhotoCloud Application Design and Development  
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## General Demo Information:

There are 12 users with 4 of them being Professional users, 4 of them being Hobbyist users and 3 of them being Free users and 1 of them being the Administrator of the system.

List of users:

- 1) haluk\_erenler, 123, Professional
- 2) guneest, 123, Professional
- 3) bartu\_birol, 123, Professional
- 4) nfa26, 123, Professional
- 5) eren\_badur, 123, Hobbyist,
- 6) sebnem\_birol, 123, Hobbyist
- 7) kemalguzel16, 123, Hobbyist
- 8) ezgi, 123, Hobbyist
- 9) ipek, 123, Free
- 10) simay, 123, Free
- 11) basakbirolx, 123, Free
- 12) 123, 123, Administrator

Each user has a unique username and password, users should have other information namely user type, name, surname, email address, age and a profile photo. The implementation of the users along with the other private information are as:

```
Professional prof1 = new Professional("haluk_erenler", "123", "Haluk",  
"Erenler", "haluk@gmail", 21, "pp.png");  
  
Professional prof2 = new Professional("guneest", "123", "Güneş", "Tüfekçi",  
"guneest@gmail.com", 18, "pp.png");  
  
Professional prof3 = new Professional("bartu_birol", "123", "Bartu",  
"Birol", "birolbartu@gmail.com", 20, "bartu_foto.jpeg");  
  
Professional prof4 = new Professional("nfa26", "123", "Nurkan Fatih",  
"Altunel", "altnur21@robcollk12.tr", 21, "pp.png");  
  
Hobbyist hob1 = new Hobbyist("eren_badur", "123", "Eren", "Badur",  
"badere21@robcollk12.tr", 21, "pp.png");  
  
Hobbyist hob2 = new Hobbyist("sebnembirol", "123", "Sebnem" , "Birol",  
"birolsebnem@gmail.com", 51, "pp.png");  
  
Hobbyist hob3 = new Hobbyist("kemalguzel16", "123", "Kemal" , "Güzel",  
"kguzel", 21, "pp.png");
```

```

Hobbyist hob4 = new Hobbyist("ezgi", "123", "ezgi", "mih", "aasdf", 21,
"pp.png");

Free f1 = new Free("ipek", "123", "ipek", "Yavuz", "iyavuz@gmail.com", 20,
"ipek1.png");

Free f2 = new Free("simay", "123", "Simay", "Öğün", "sogun@ku", 21,
"simay1.png");

Free f3 = new Free("basakbirolx", "123", "Başak" , "Birol",
"hiIambasakbirol", 15, "pp.png");

```

Lastly the information about the administrator is as: (Apart from having Professional user features administrator can delete photos in the discover page.)

```

Administrator admin = new Administrator("123", "123", "123", "123", "123",
123, "pp.png");

```

## Application Usage Information:

### Sign up / Log in Guide:

The image displays two side-by-side screenshots of a Mac OS X-style application window titled "PhotoCloud".

**Left Screenshot (Login Screen):**

- Top bar with red, yellow, and green buttons.
- Title bar: "PhotoCloud".
- Content area:
  - Label: "Username:" followed by an input field.
  - Label: "Password:" followed by an input field.
  - Buttons: "Log in" and "Sign up".

**Right Screenshot (Sign-up Screen):**

- Top bar with red, yellow, and green buttons.
- Content area:
  - Labels and input fields for: "Username", "Password", "Name", "Surname", "Email", and "Age".
  - Section: "Choose your plan:" with three radio button options: "Free", "Hobbyist (5.00TL)", and "Professional (20.00TL)".
  - Buttons: "Back" and "Sign up".

As we run the main method of the project, we encounter a Login page as the one in top left. Any wrong username and password combination would give the invalid username or password error. After that, for new users, sign up is required and when we click on the sign-up button, we encounter a sign-up page as the one in top right. We need to enter all required information and all empty spaces are required.

### Sign Up Page:

There are certain rules in the sign-up page, for example, if the newly created shouldn't exist in the user list, the password created should be more than 8 characters, there should be an @ symbol in the mail, age should be valid, and the user plan should be selected otherwise the app would give an error message about the problem. Example error messages:

The figure consists of three side-by-side screenshots of a sign-up form. Each screenshot shows a window with various input fields and a radio button group for selecting a user plan.

- Screenshot 1:** Shows an error message "email doesn't contain @ symbol" below the Email field.
- Screenshot 2:** Shows an error message "Age is not valid" below the Age field.
- Screenshot 3:** Shows an error message "password should be more than 8 characters." below the Password field.

**Common UI Elements:**

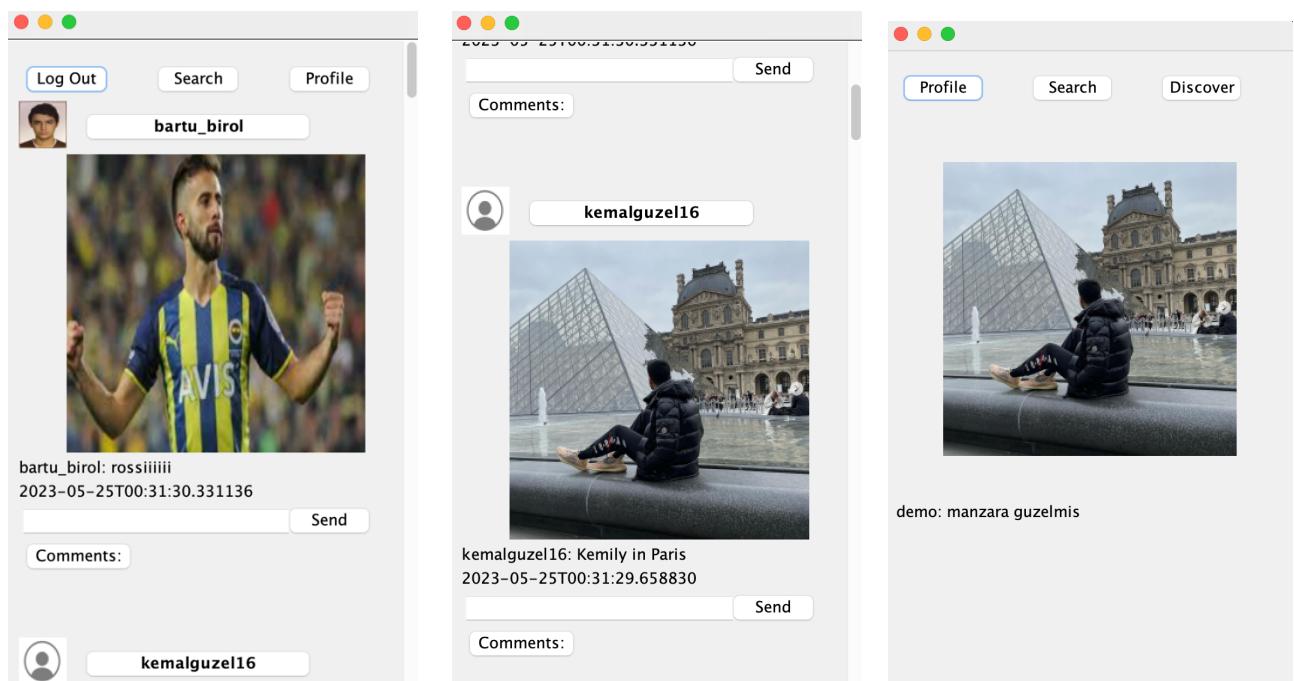
- Inputs:** Username, Password, Name, Surname, Email, Age.
- Radio Buttons:** Choose your plan:
  - Free
  - Hobbyist (5.00TL)
  - Professional (20.00TL)** (highlighted in yellow)
- Buttons:** Back, Sign up.

Once the back button is clicked user encounters the login page again. Once the sign-up button is clicked with the valid information, user encounters to the login page and new account has been created.

### User's Guide:

#### Discover Page:

When the user is logged with the valid username and password combination the discover page should be encountered as this page with the vertical scrollbar on the right, the photos are sorted according to their creation dates:

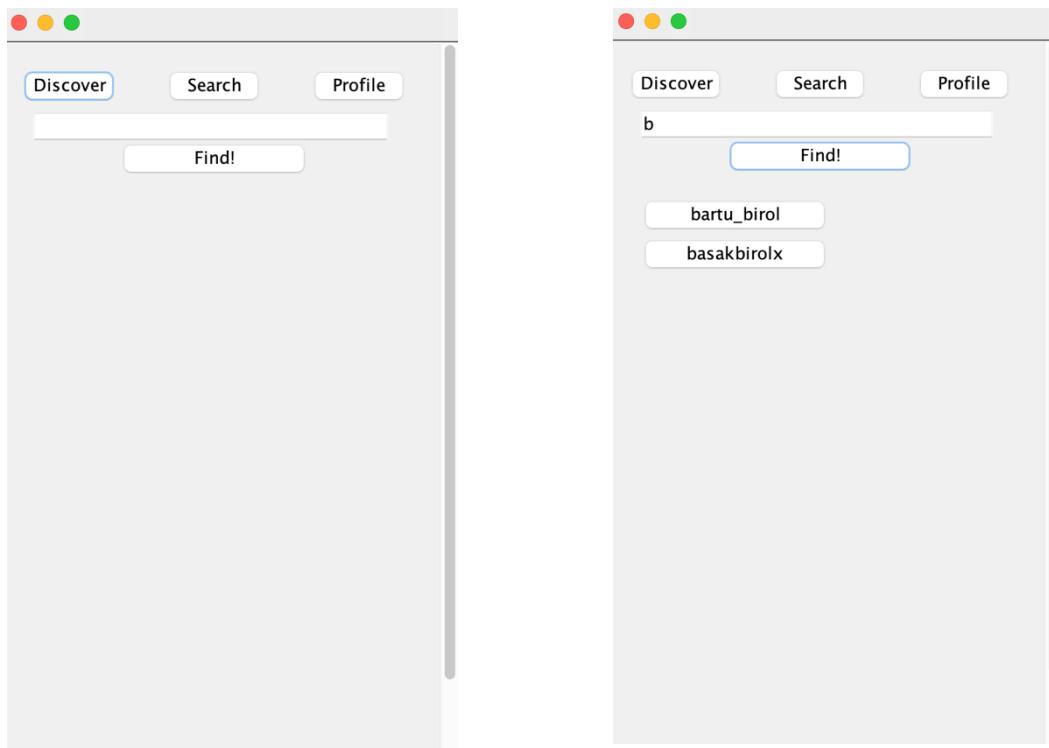


There are a few options that user can do in discover page other than looking and enjoying the photos. Firstly, the user can log out with the log out button directed to the log in page.

Secondly user can make a search about another user by clicking the Search button. Thirdly, user can go to his/her own profile page by clicking to the Profile button and directed to the profile page. Furthermore, user can be directed to the desired user's profile by clicking to the desired user's username in the discover page and users can make comments by writing inside the text field and clicking send button after that users can display the comments made by other users from the "Comments" button an example is on top right.

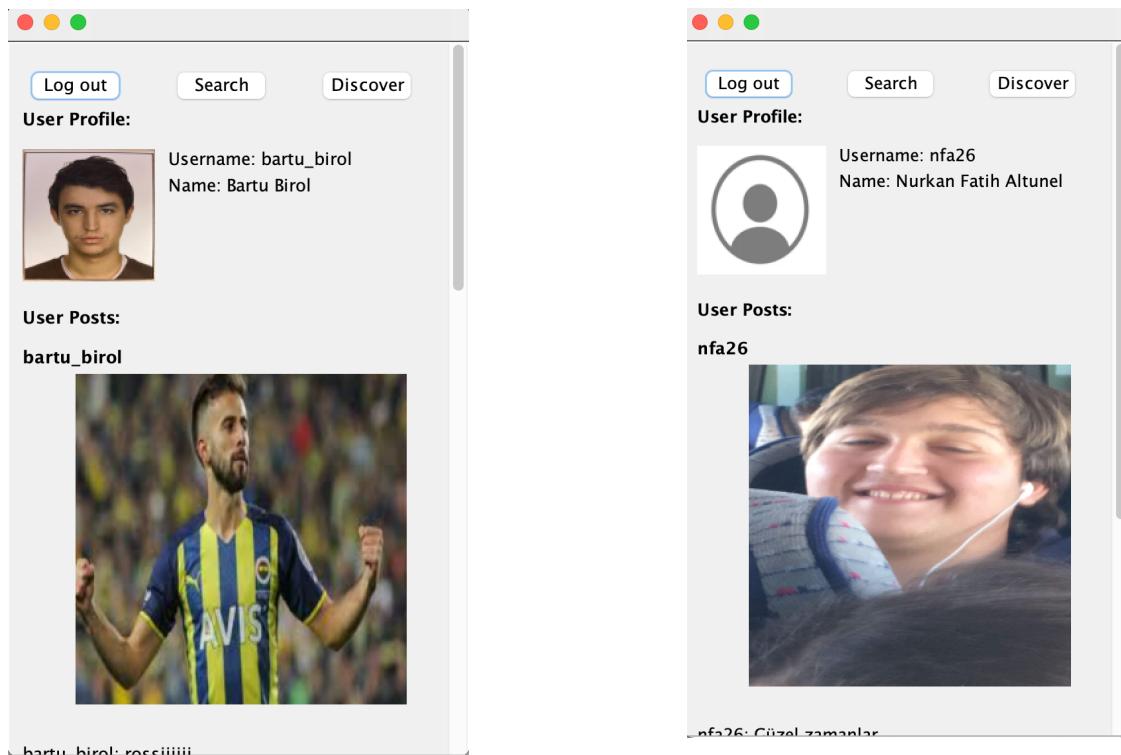
### Search Page:

When the Search button is clicked, the user is directed to an empty page with a Text Field and a button named "Find!". When "Find!" is clicked the program iterates over the users and outputs the users whose name is started with the given text input. In this case the text input is "b" and when Find button is clicked the program lists the users whose names starts with "b" as buttons where when the button is clicked the users directs to the profile page of the desired user.



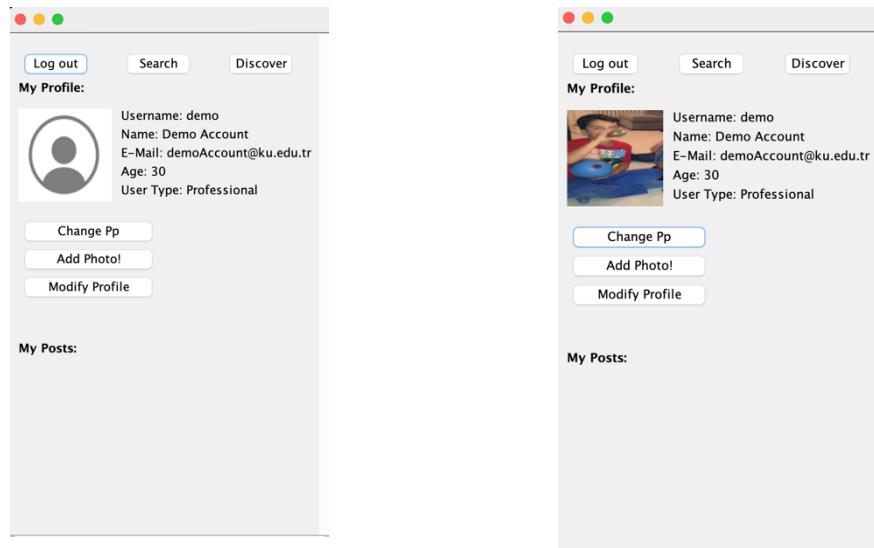
### Profile Page of Other User:

When the desired user's button is clicked, program directs the main user to the profile page of the desired user. For example, bartu\_biro is clicked and the output is as the following, only the username and name are visible, and no actions can be done other than viewing the photo and there is a second example at the bottom.



## Profile Page:

To direct to the profile page from this page, the user can first click to the discover page and after that he/or she can click to the Profile button. At the first sight the profile page is as the bottom left:

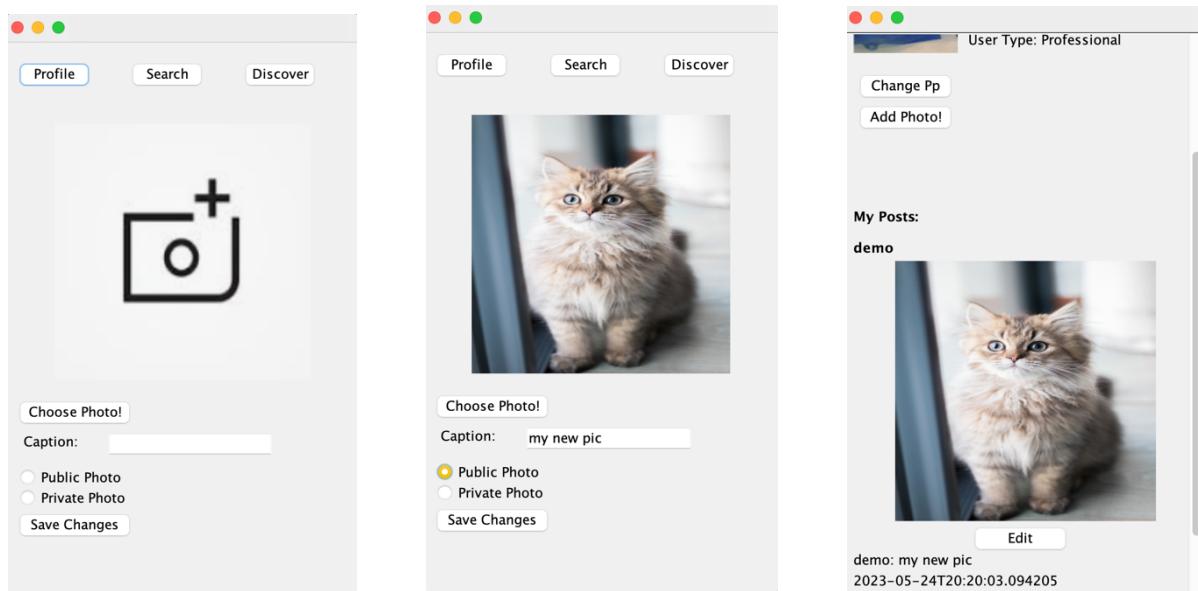


Where the private information (such as name, e-mail, age and user type) is visible and there is a default profile photo is set to the newly created users profile photo, The user can change the profile photo or add photos to the account the file upload can be done by the File Chooser class. User can modify the information via the modify profile method.

This screenshot shows the 'Profile' tab selected in the top navigation bar. Below it are five input fields for 'Password', 'Name', 'Surname', 'Email', and 'Age'. A question 'Which information would you like to change?' is displayed below the fields. At the bottom are 'Back' and 'Save' buttons.

### Photo Sharing:

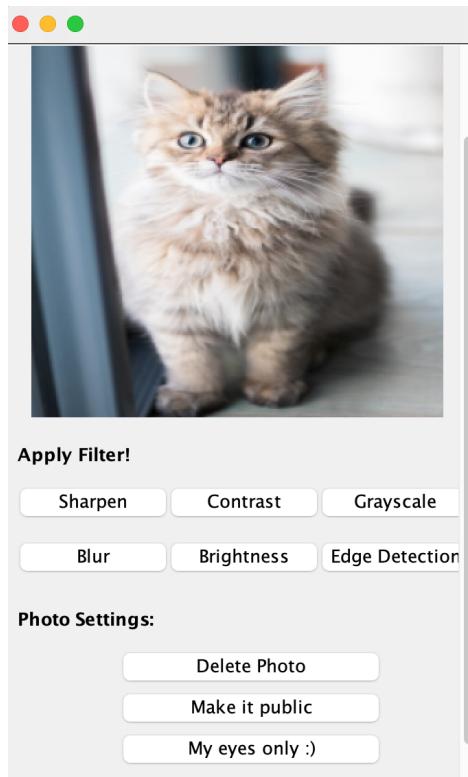
When the user clicks to the “Add Photo” button he/she encounters with the Photo Sharing page which looks like the bottom left: When the photo is chosen it appears on the page as it is in the bottom middle but the access type should be specified either as public or private otherwise an error message would appear when the save changes button was clicked. When the photo is added it would appear in the profile page of the user as the bottom right.



### Photo Editing and Filters Guide:

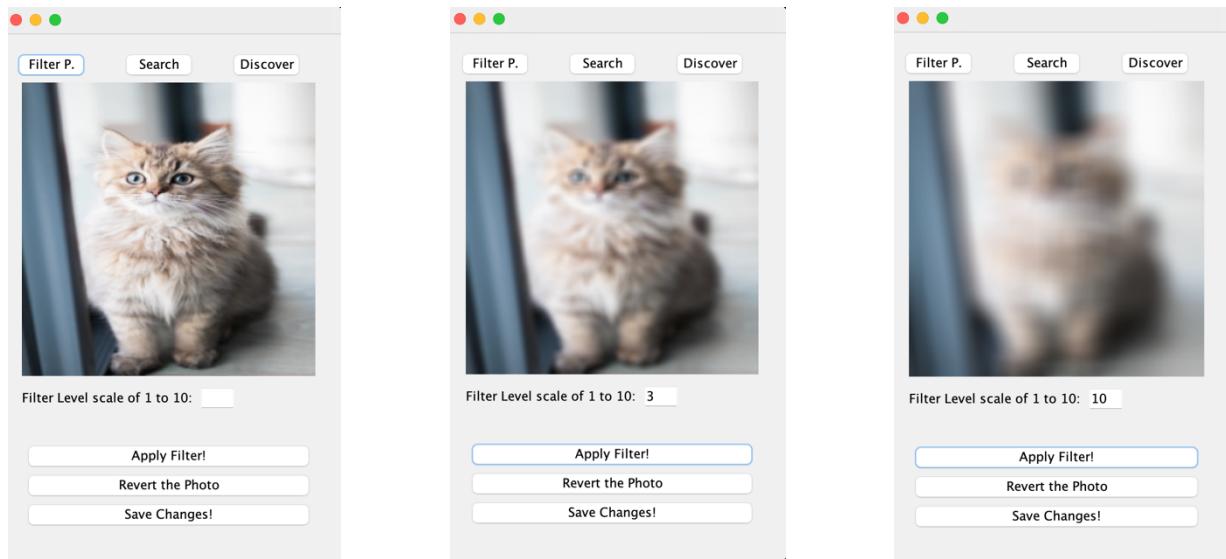
When a photo is added there should be an Edit button appearing under each photo. When edit button is clicked user can do many functions on the photo. Apart from being able to apply different filters (such as blur, sharpen, contrast, brightness, grayscale, edge detection) User can delete the photo, make it public or private. The interface is as the bottom left.

## Filter Page:



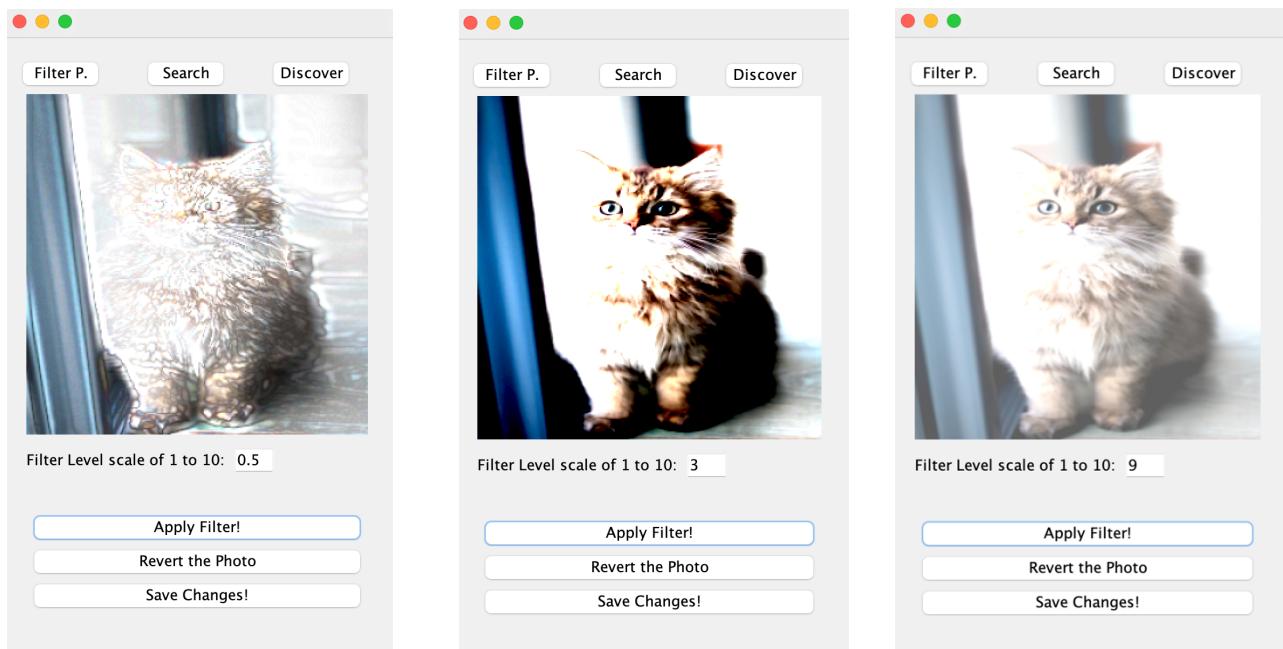
When the photo is made public, it is visible in the profile page and discover page, when it is public, it is only visible in the profile page of the main user, and it cannot be accessed by any other user. To apply filters to the photos user should select the desired filter type, for example blur is selected, the user is directed to an image changer page where she or he can adjust the filter level as the top right photo giving double type inputs. If the input is not a double or type When the Apply Filter button is clicked, the output is as the following. When changes are saved then the photo appears on the profile page of the user also in the discover page if it is public. The example on the top is a Professional user therefore he/she can have access to all filters.

## Image Changer:

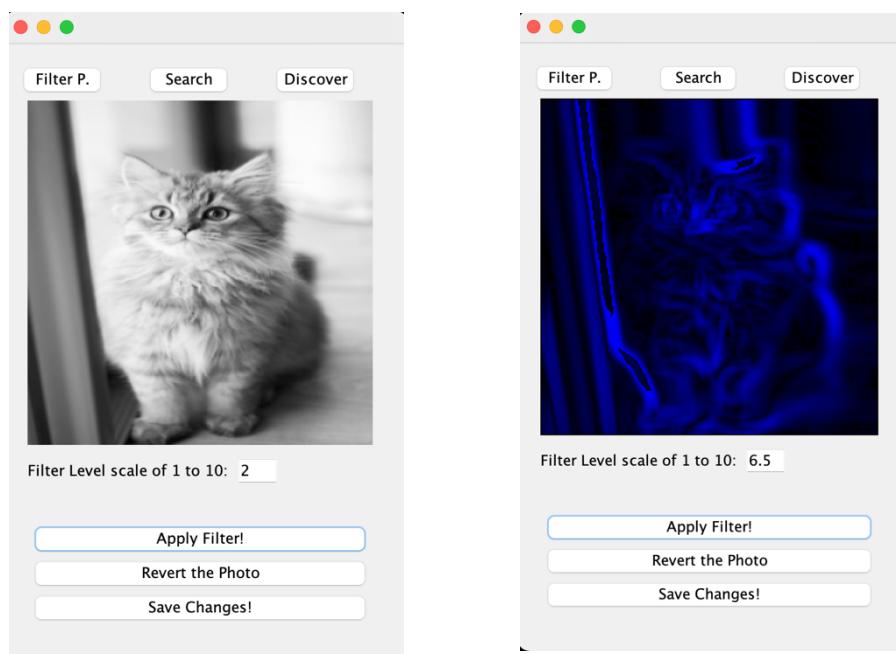


There are other filter implementations such as sharpen, contrast, brightness, grayscale, edge detection. When those filters are applied the functioning is as the following.

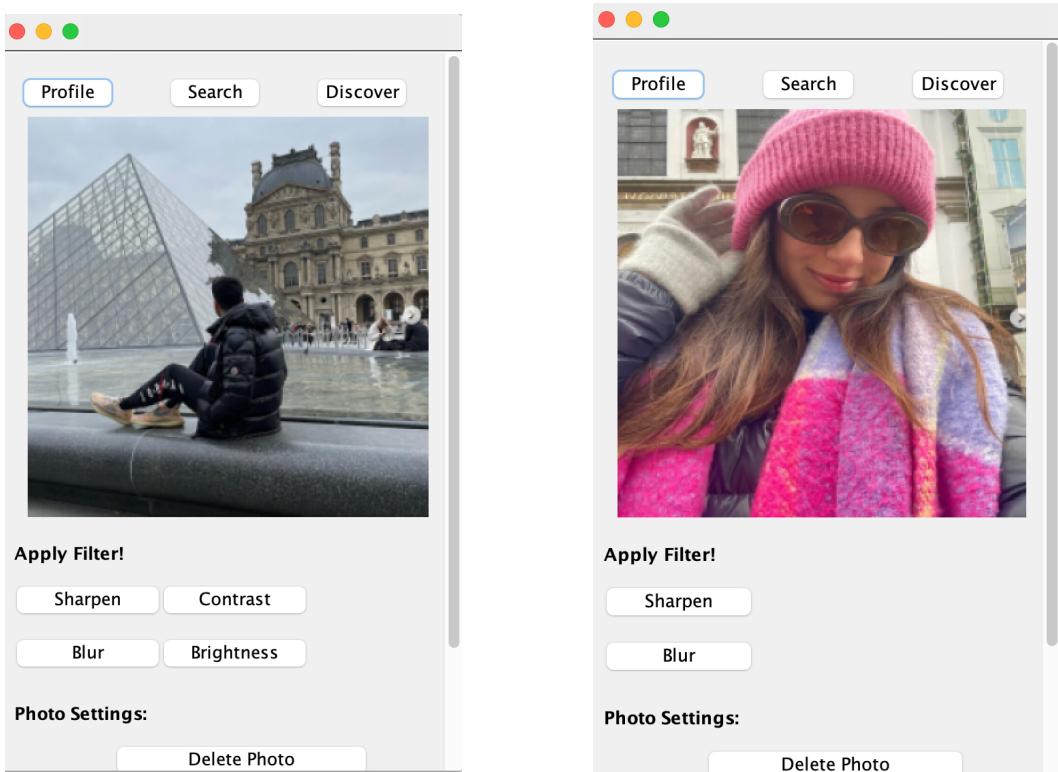
For sharpening, contrast, and brightness:



For grayscale and edge detection:

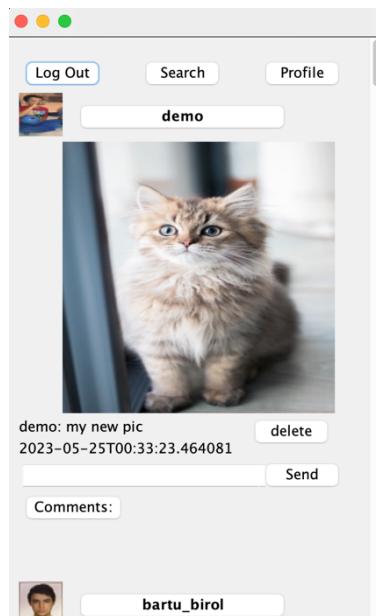


When we look at the other Hobbyist and Free user privileges, we can see that Hobbyist users have access to four filters whereas Free users only have access to two filters.



### Administrators Guide:

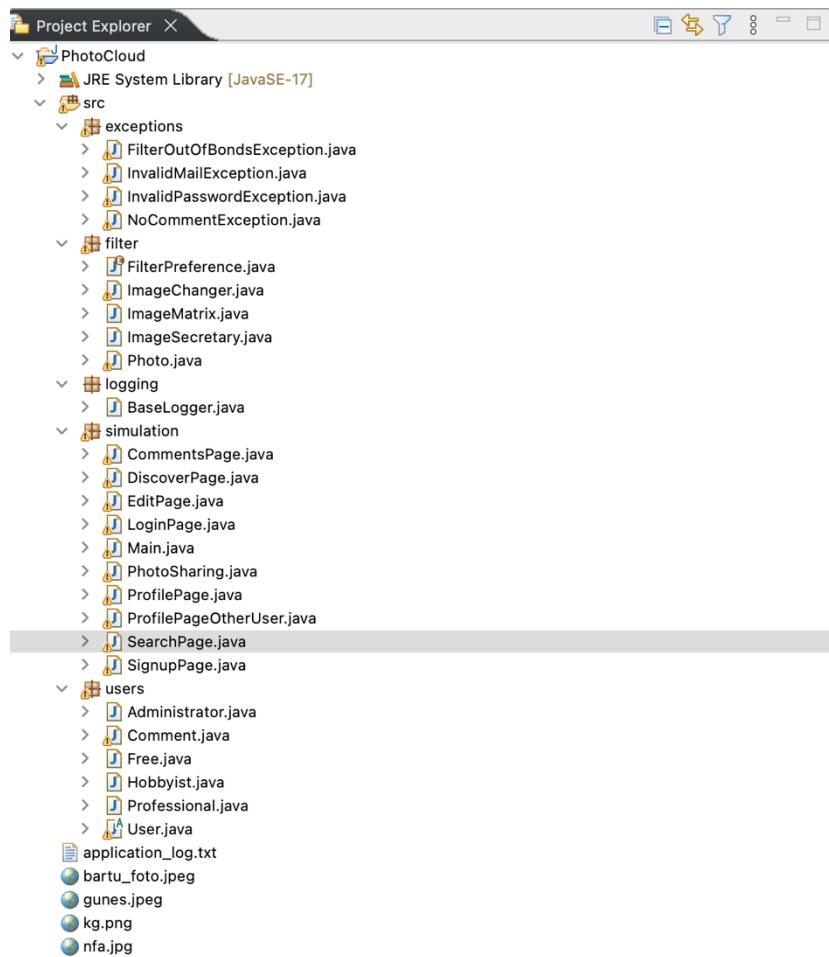
The difference of the administrator from the other users is that administrator has the Professional account privileges, and it also can delete the photos in the discover page via the button specialized for the administrator the example explains it better.



# Project Design Description:

## Class Relations:

Inside the project source folder there are 5 packages namely, exceptions, filter, logging, simulation, users. Each of the class has relation with another class.



- Exceptions package: Consists of the possible specialized exceptions that were handled during the running of the program for example `FilterOutOfBonds`, `InvalidPassword` etc.
- Filter package: Consists of classes which are related with the added photos and filtering, namely `filterpreference`, `imagematrix`, `photo` etc.
- Logging package: Consists of a single class named Base logger to save the events either exception or as information in the separate text files.
- Simulation package: Consists of classes of JFrame output each representing new page, for example discover page, profile page, search page etc.

- Users package: Consists of classes which are related to the users. The super abstract user class and its concrete subclasses Free, Hobbyist, Professional and Administrator, also there is a comment class to parametrize the comments which are made for each photo.

The critical classes for this project are listed below. The reason why they are critical is that they hold the information and each of them is a unique type which has been used frequently.

#### User Class:

As mentioned before each user have 7 important parameters namely (username, password, name, surname, mail, age, photo)

#### Photo Class:

Photo class is important since the posts are the major component of the project. Photo class consists of 5 parameters namely (User, caption, filepath, creationDate and isshared Boolean). By iterating the photo sets the discover page and the profile page is created.

#### ImageMatrix Class:

ImageMatrix class which creates a matrix of RGB parameters of each pixel in the photo and each photo has its unique image matrix information which can be modified after applying the filter.

#### Comment Class:

Comment class is also important, and it consists of 3 parameters namely a user, a photo and message which is written. As we go to the comments page for a photo, comments for the desired photos are iterated and listed.

#### Inheritances, Type Hierarchies, Interfaces, Abstract Classes.

Firstly, the major type of hierarchy is used for the users. User class cannot be instantiated only by itself so Free, Hobbyist, Professional and Administrator classes are used as the subclasses of User, and they are concrete classes since we can create the instances of each of them. Also, there is relation of subclasses and super classes between the concrete classes as

well. For example, Hobbyist class is a subclass of Free, Professional class is a subclass of Professional and Administrator class is the subclass of Professional. Secondly there is the type hierarchy in the exceptions class where each specialized Exception (such as NoCommentException, InvalidPasswordException) is a subclass of the Exception class so it was important for this project to classify the exception type;

During the project there are usage ActionListener and, Comparable interfaces. ActionListener interface executes commands when the regarding button is clicked thus it is an important component of the project and Comparable interface was used to sort the photo objects according to the creation date. The newest photo is at the top.

### GUI Components:

The GUI components and their significance are listed as below:

JFrame: Frame is the fundamental GUI component in the project at each transition to another page (for example from discover page to profile page) a new Frame window is created and old one disposes this is the major component of the GUI for displaying panel that holds desired information.

JPanel: Just like Frame it is also a fundamental GUI component in the project the elements such as labels, buttons and text fields are added to the panel. So, it plays key role for holding the information.

JButton: Buttons are used while making transitions from page to page or executes specific functions in the program such as applying filter, saving changes of filter operation for a photo, reverting the photo to its original form, or listing the users that were being searched.

JLabel: Labels are used to display the messages or other information such as photos captions, comments and dates that photos are posted also at the beginning the name of the app and the desired information that needs to be entered in the Signup Page or Login Page.

JTextField: Text Fields are used for getting the information from the user as a input. In the signup page, login page, search page they were used widely and at the input of the filter level in the ImageChanger.

JScrollPane: Vertical Scroll Panels play a key role in the implementation of Discover Page and the profile pages while each iteration of a photo in the discover page or in the profile page the vertical length of the panel increases by the desired amount.

JRadioButtons and Button Groups: Radio Buttons and button groups are used for the parts where user can choose one of the multiple options such as the selection of the tier and the selection of the public or private photo while uploading photo.

JOptionPane: For specific error or info messages such as when the account is created and when there is no comment was made when the send button is clicked.

## **References:**

YouTube. (2020a). *YouTube*. Retrieved May 25, 2023, from  
<https://www.youtube.com/watch?v=Kmgo00avvEw>.

YouTube. (2020). *YouTube*. Retrieved May 25, 2023, from  
<https://www.youtube.com/watch?v=iE8tZ0hn2Ws>.