

Final Project Report

Project Name: PHOTOMASTER

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Acknowledgement

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We would also like to express our gratitude to our Faculty Mentor, Prof. Dr. Manoj S. Sankhe for providing all the required guidance and suggestions to accomplish my project.

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Abstract

A Mobile Application that enables users to manage their images more efficiently using image tags, where each image can be assigned a tag based on user's preference and these images can later be searched by the given tags. Users are also provided with a duplicate detection feature that checks every image in the gallery and shows the user the duplicate images giving them the choice to delete or retain the image. Other features include geotagging which shows the location of images taken using the app and image enhancements which provides user with crop, rotate, and other filter based enhancements.

Introduction

1.1 Scope

- Photomaster is an application aimed towards solving the problem of cluttered galleries on one's devices and it also enables the user to personalize the way in which he views photos.
- The application could tag images based on several parameters which makes sorting and searching the gallery a much better experience as compared to the endless scrolling most users resort to.
- Images can be searched based on predetermined parameters to retrieve only those that are required.
- The application enables users to share selected images across various social media platforms
- Photomaster provides its users with a geolocation feature where images taken with the photo master app can be geotagged and viewed on a map
- Photomaster aims to act as a one stop application that enables users to reduce clutter, efficiently organize and retrieve images, whilst also providing the user with the choice of beautifying images by means of minor adjustments.

1.2 Purpose

While there are applications like Adobe bridge, Google Photos freely available in the market, they only provide some of this application's functionality. A lot of features available on one application are not available on another thus forcing the user to download multiple applications. Photomaster takes a simpler approach unlike its counterparts that have such large learning curves that users must resort to taking courses on how to use the application. Our product also reduces the overhead of going through multiple applications by serving as a one stop shop that provides all of the functionalities in one application.

In this digital age, users capture and store thousands of images on their devices, while the expansion of memory in mobile devices in the recent years has facilitated this development, the user often struggles when asked to display a particular image, with the current applications in the market users are expected to scroll endlessly through their gallery, which simply takes a lot of time. This application aims to fix this problem with our efficient search system and the option of clients assigning tags to images, users can quickly find the image they're looking for by simply entering a tag, the tag can be an event, place, person etc. By scanning all accessible storage, the app will display every duplicate image providing them with an option to delete or retain said image.

The app also provides users with a geolocation feature wherein users can view images taken with the photo master app on the map. Photomaster provides its users with the option of beautifying their images using custom filters and presets.

1. System Requirements

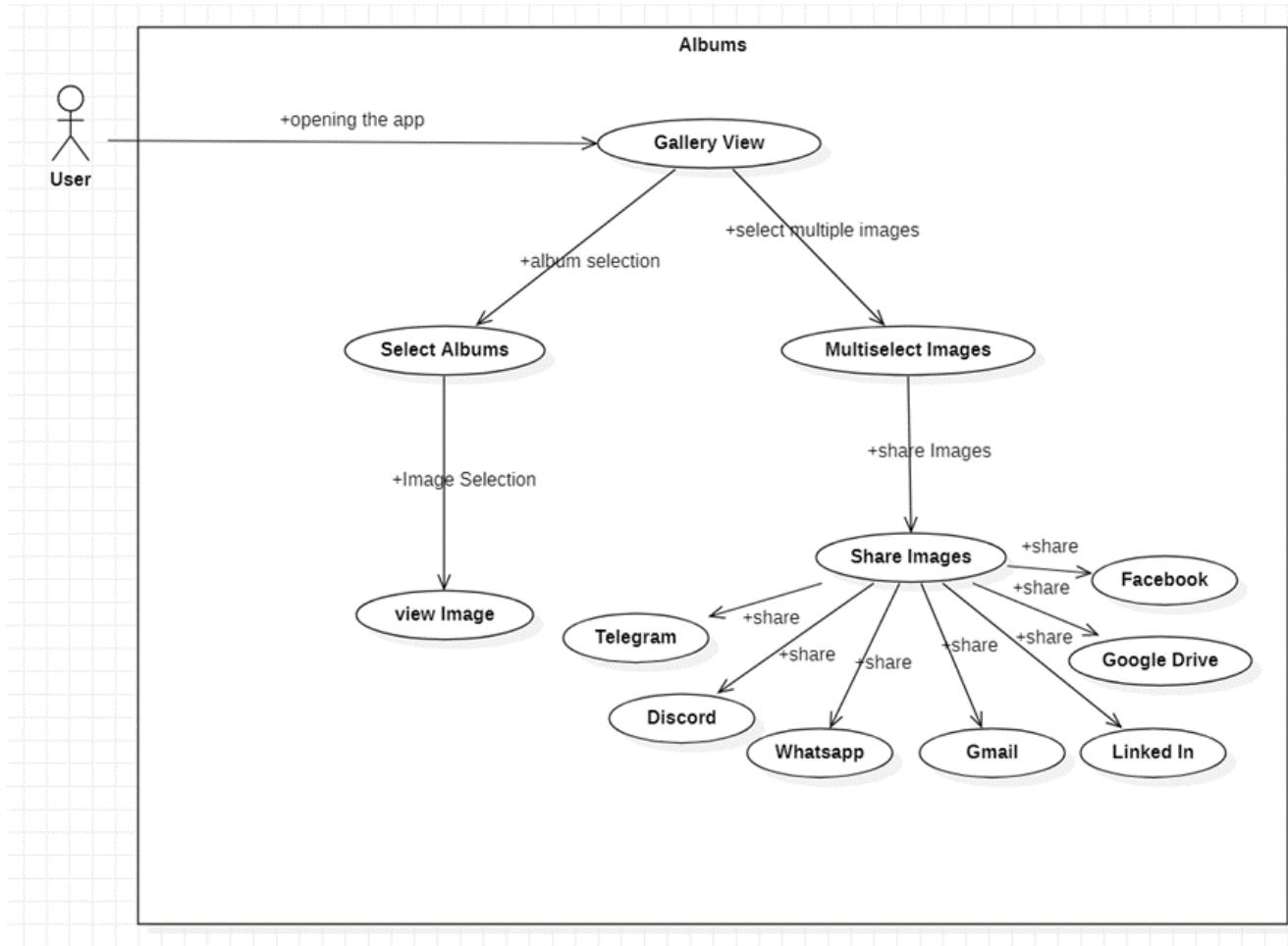
a. Performance Criteria

- **Minimize Scroll Jank:** "Jank" is the term used to describe the visual hiccup that occurs when the system is not able to build and provide frames in time for them to be drawn to the screen at the requested cadence (60hz, or higher). Jank is most apparent when scrolling, when what should be a smoothly animated flow has hiccups, where the movement pauses along the way for one or more frames as the app takes longer to render content than the duration of a frame on the system.
- **Transitions that are not smooth:** These concerns arise during interactions such as switching between tabs or loading a new activity. These types of transitions should have smooth animations and not include delays or visual flicker.
- **Power inefficiencies:** Doing work costs battery, and doing unnecessary work reduces battery life
- **Minimize Memory allocations:** which come from creating new objects in code, can be the cause of significant work in the system. This is because not only do the allocations themselves require effort from the Android Runtime, but freeing those objects later ("garbage collection") also requires time and effort. Both allocation and collection are much faster and more efficient than they used to be, especially for temporary objects. So where the guidance used to be to avoid allocating objects whenever possible, the recommendation now is to do what makes the most sense for your app and your architecture; saving on allocations at the risk of unmaintainable code not the right choice given what ART is capable of

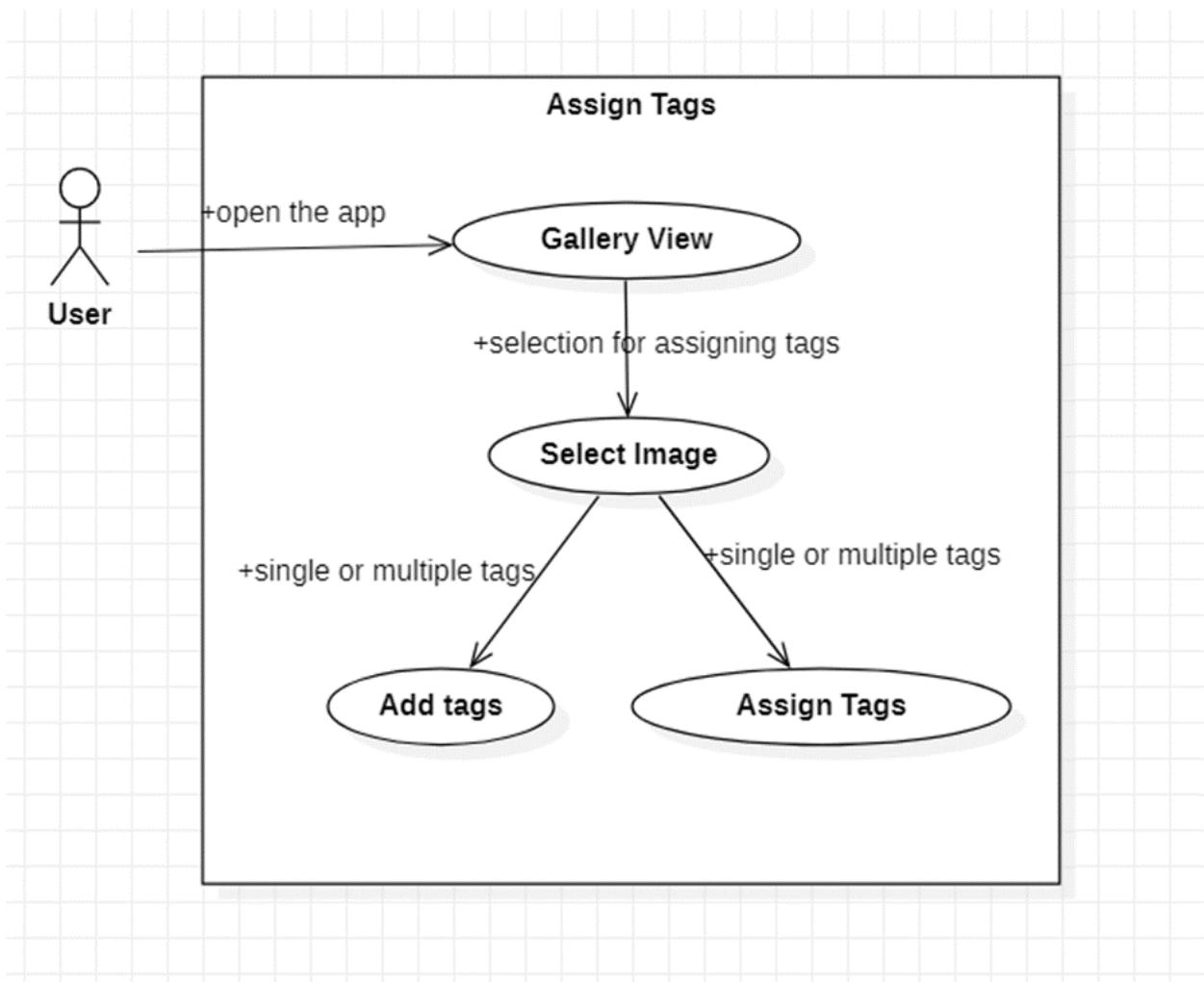
3. Functional Requirement Specification

3.1 Use Case Model

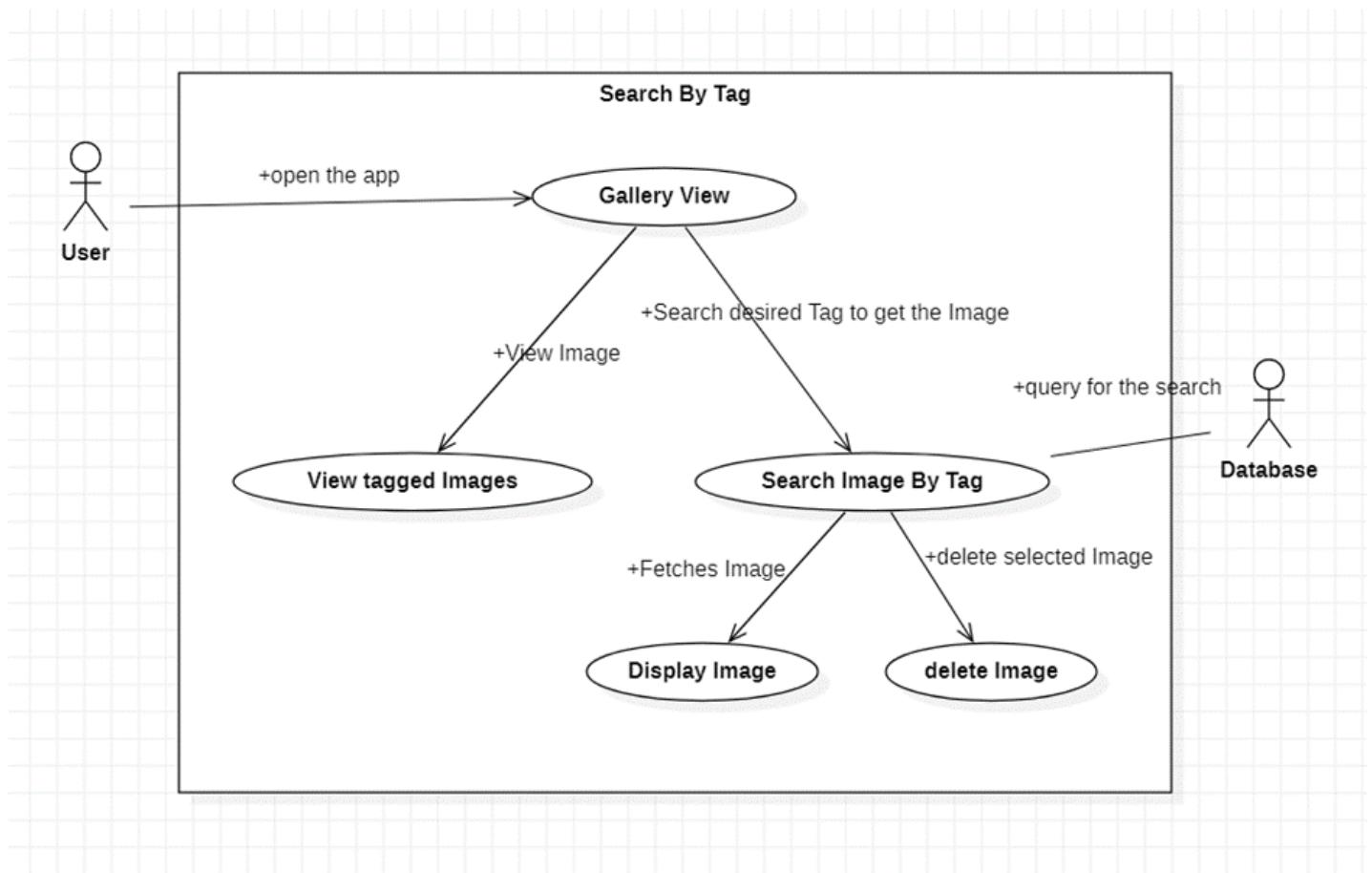
a. albums



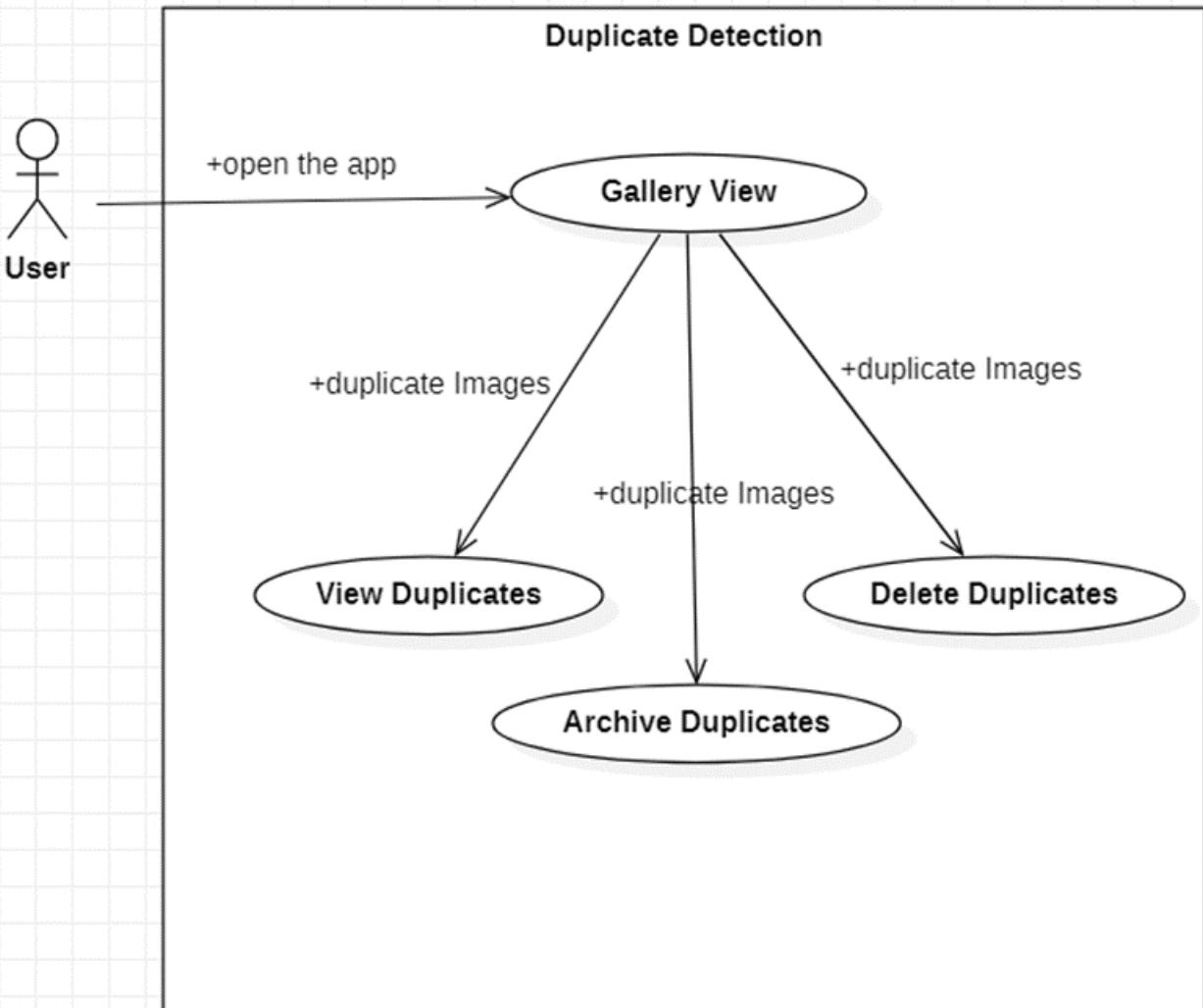
b. Tag Selection



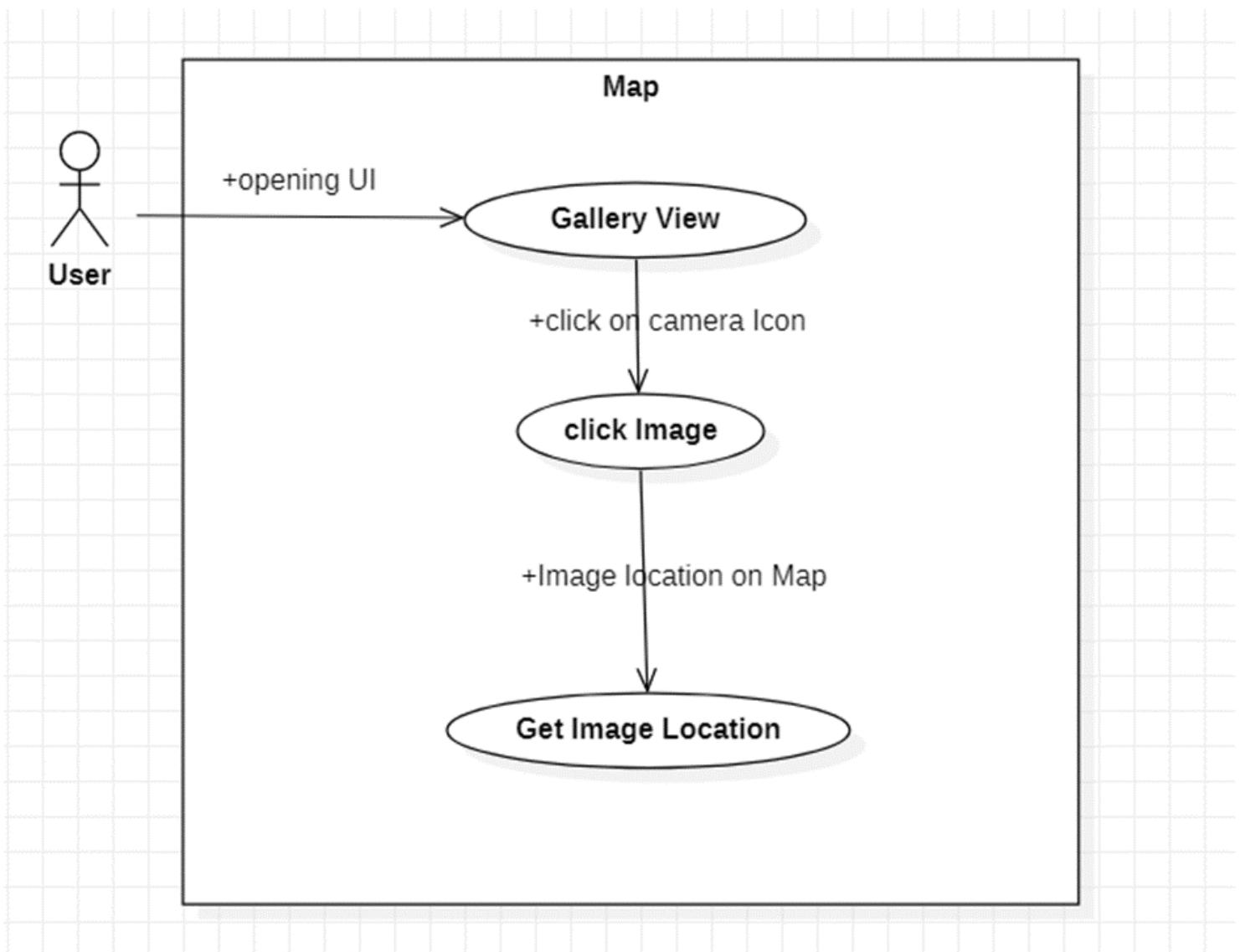
c. Search By Tags



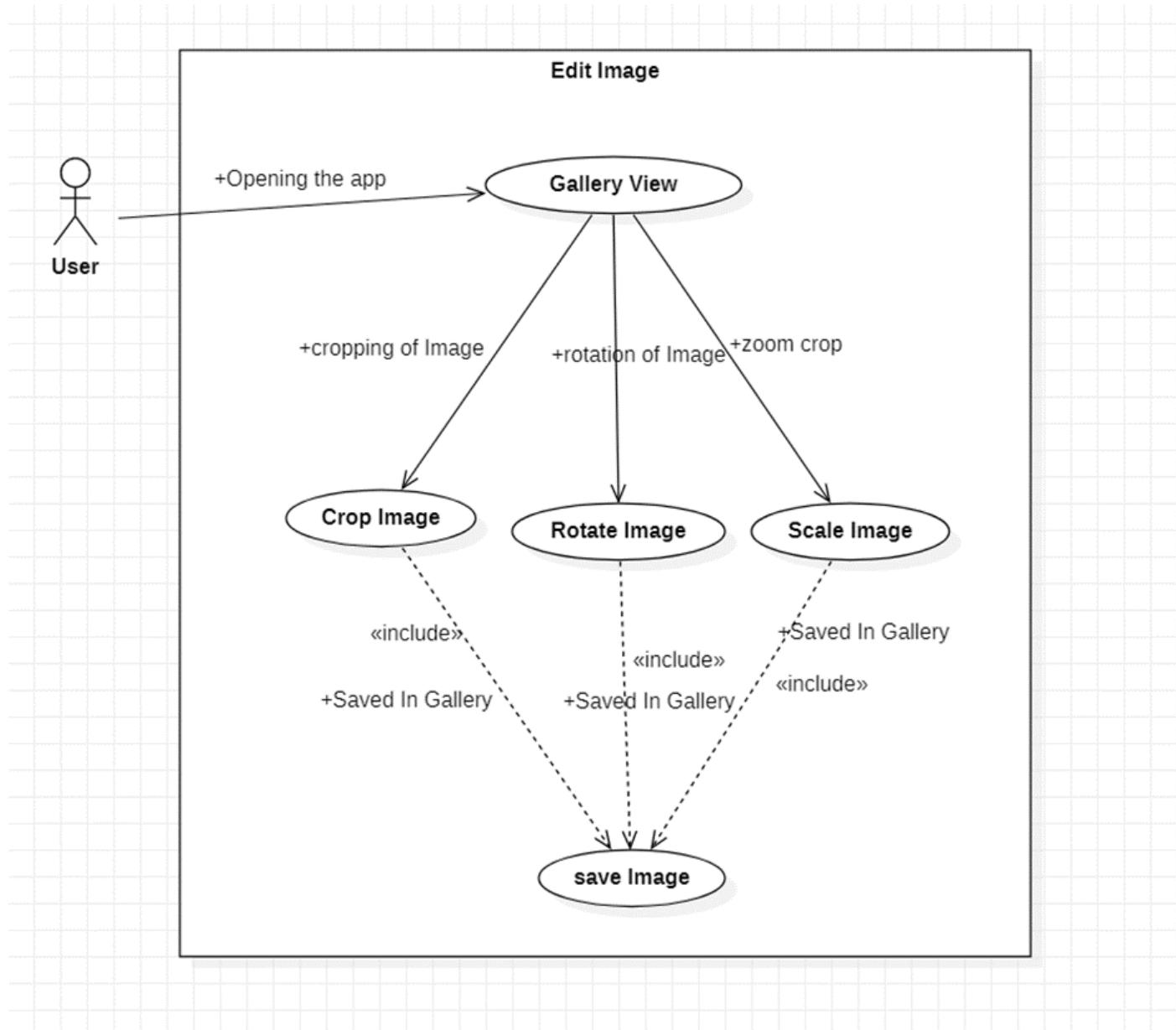
d. Duplicate Detection



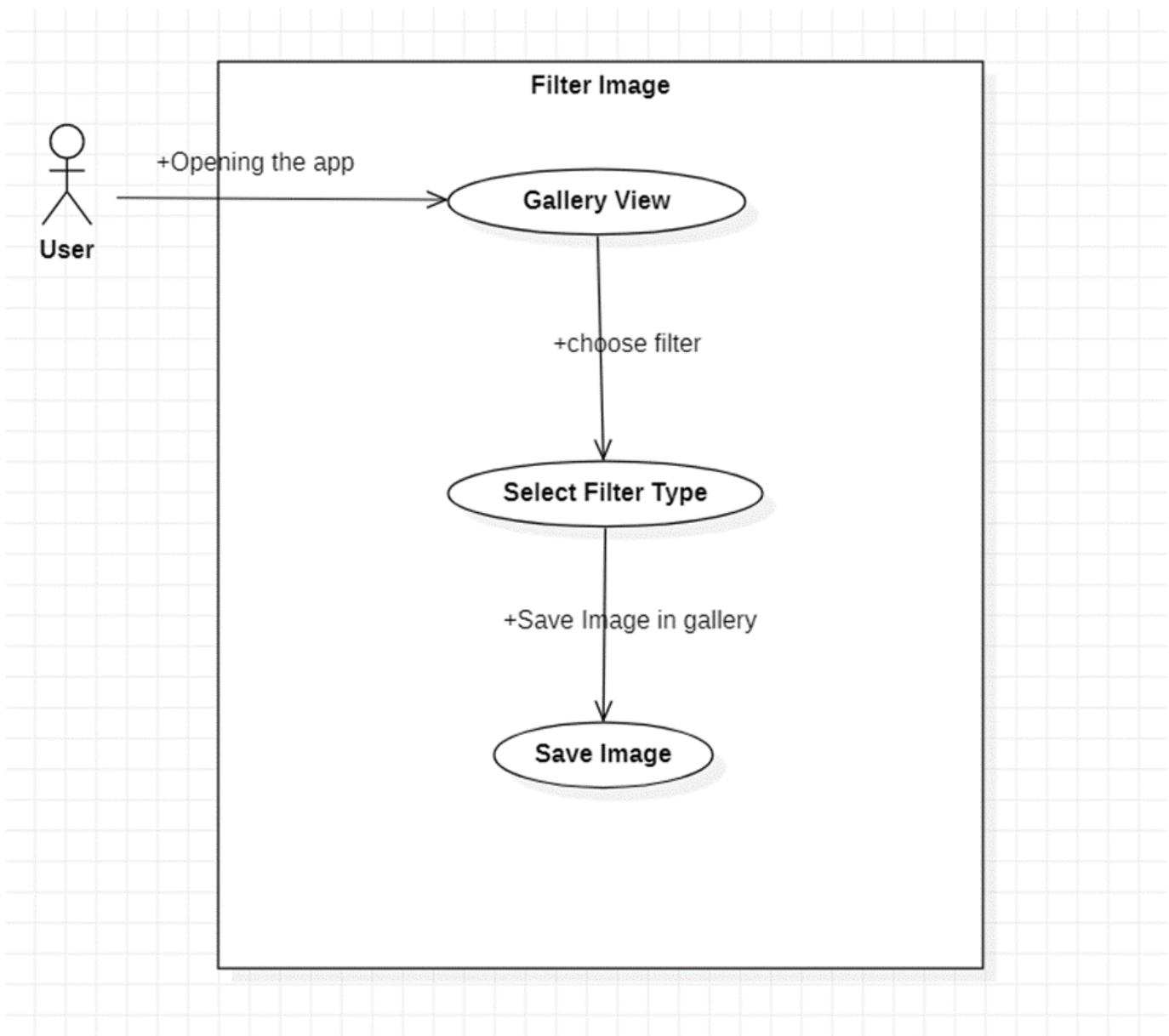
e. Geo Location



f. Edit Image

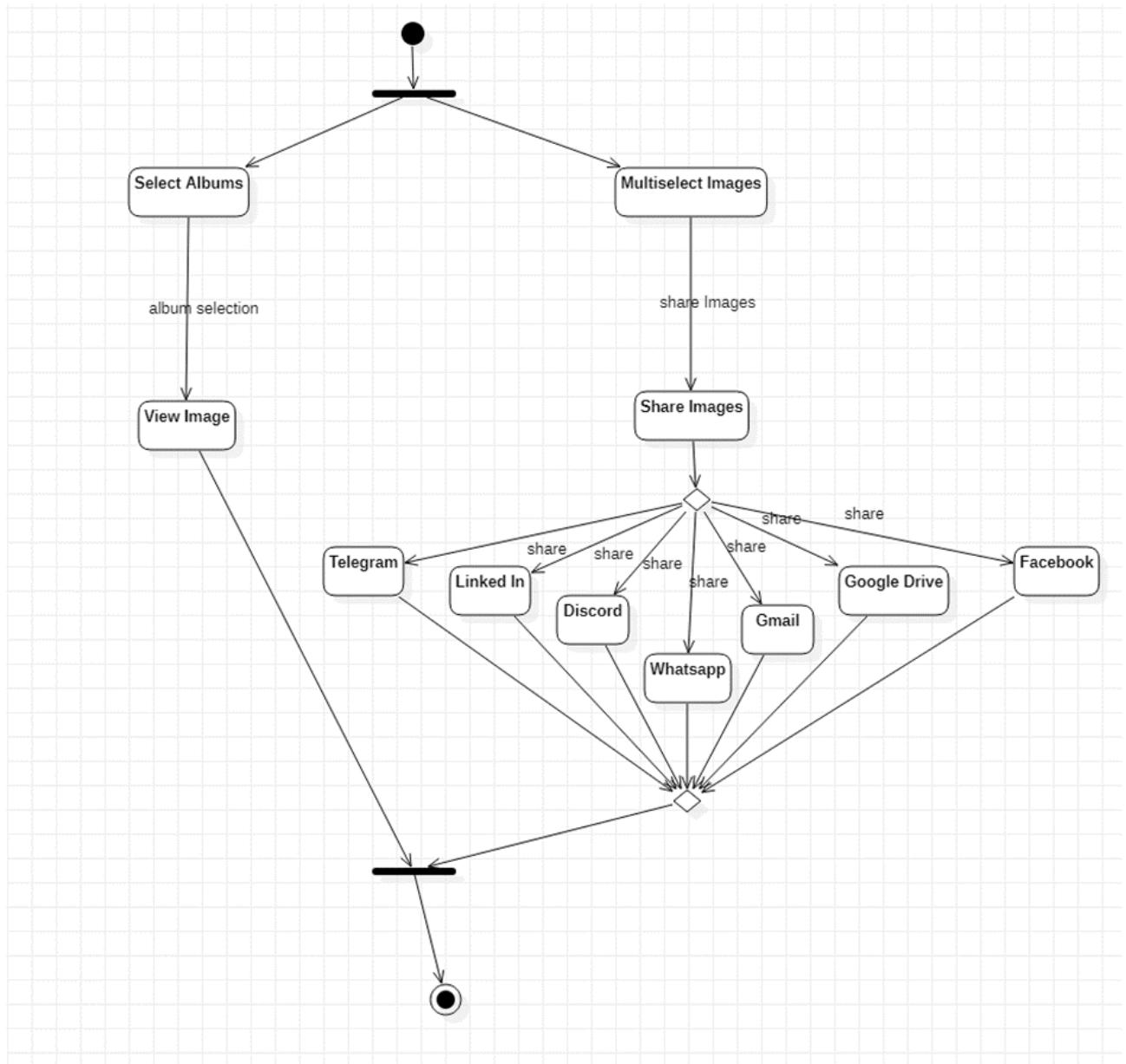


g. Filter Image

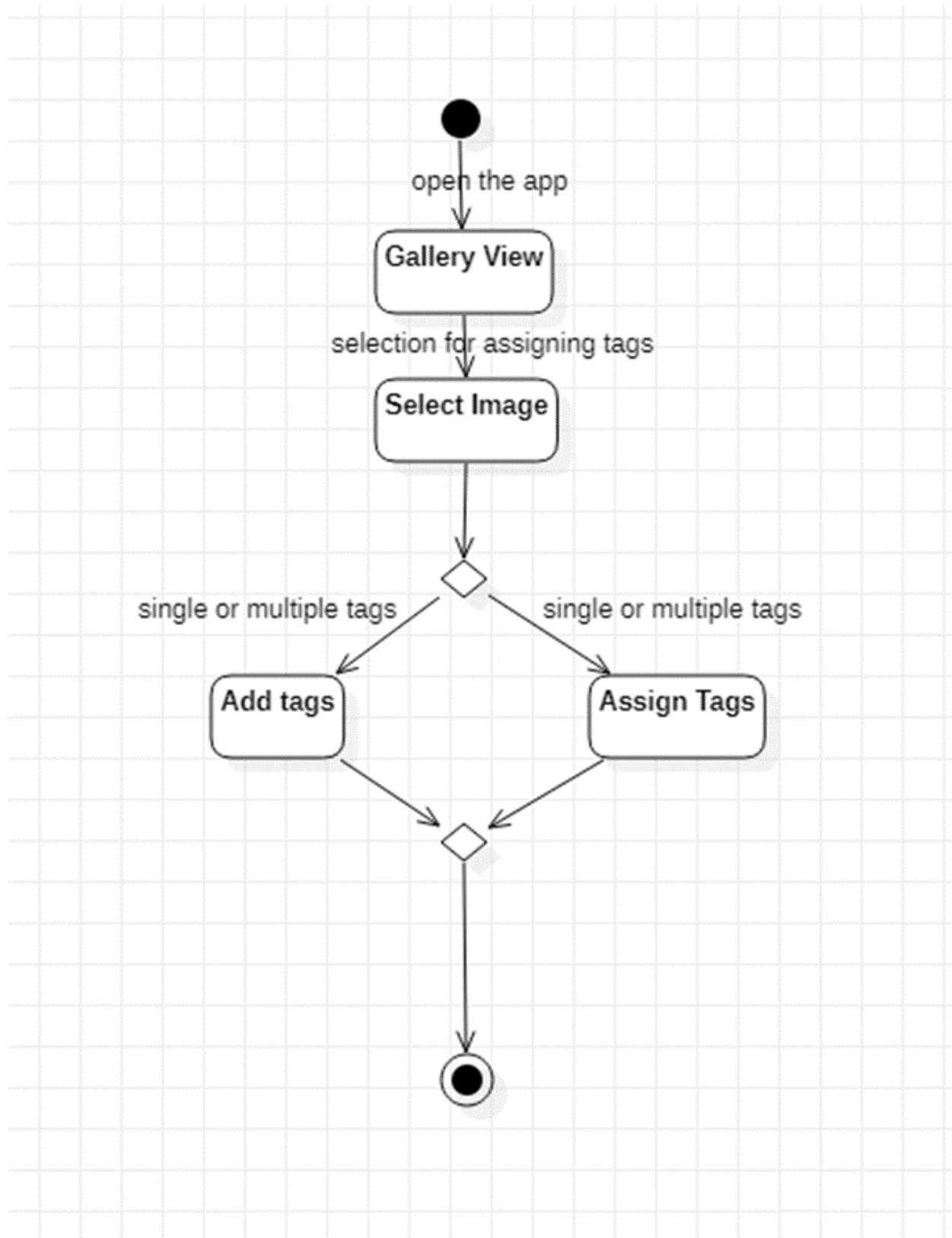


3.2 Activity Diagram

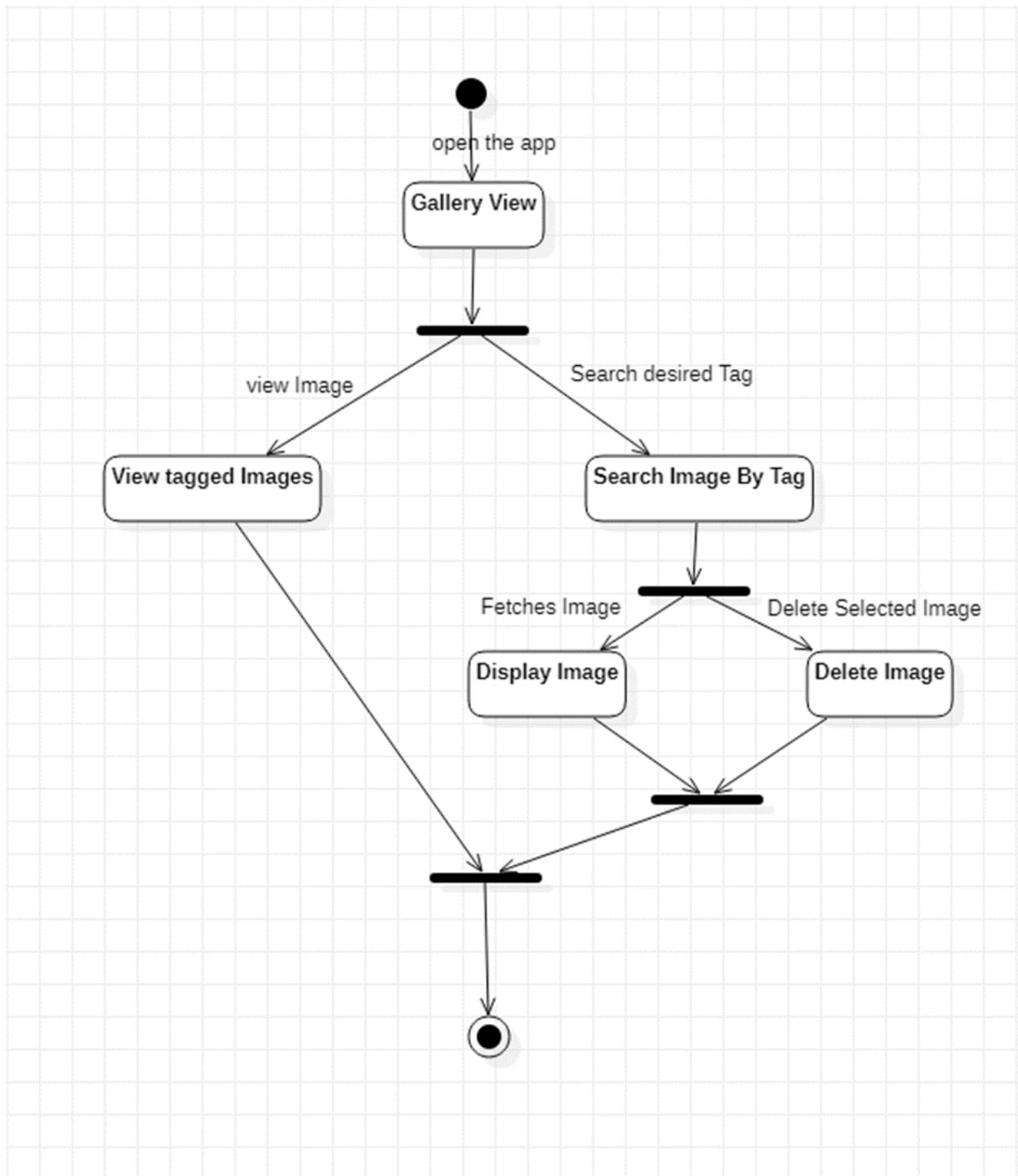
A. Albums



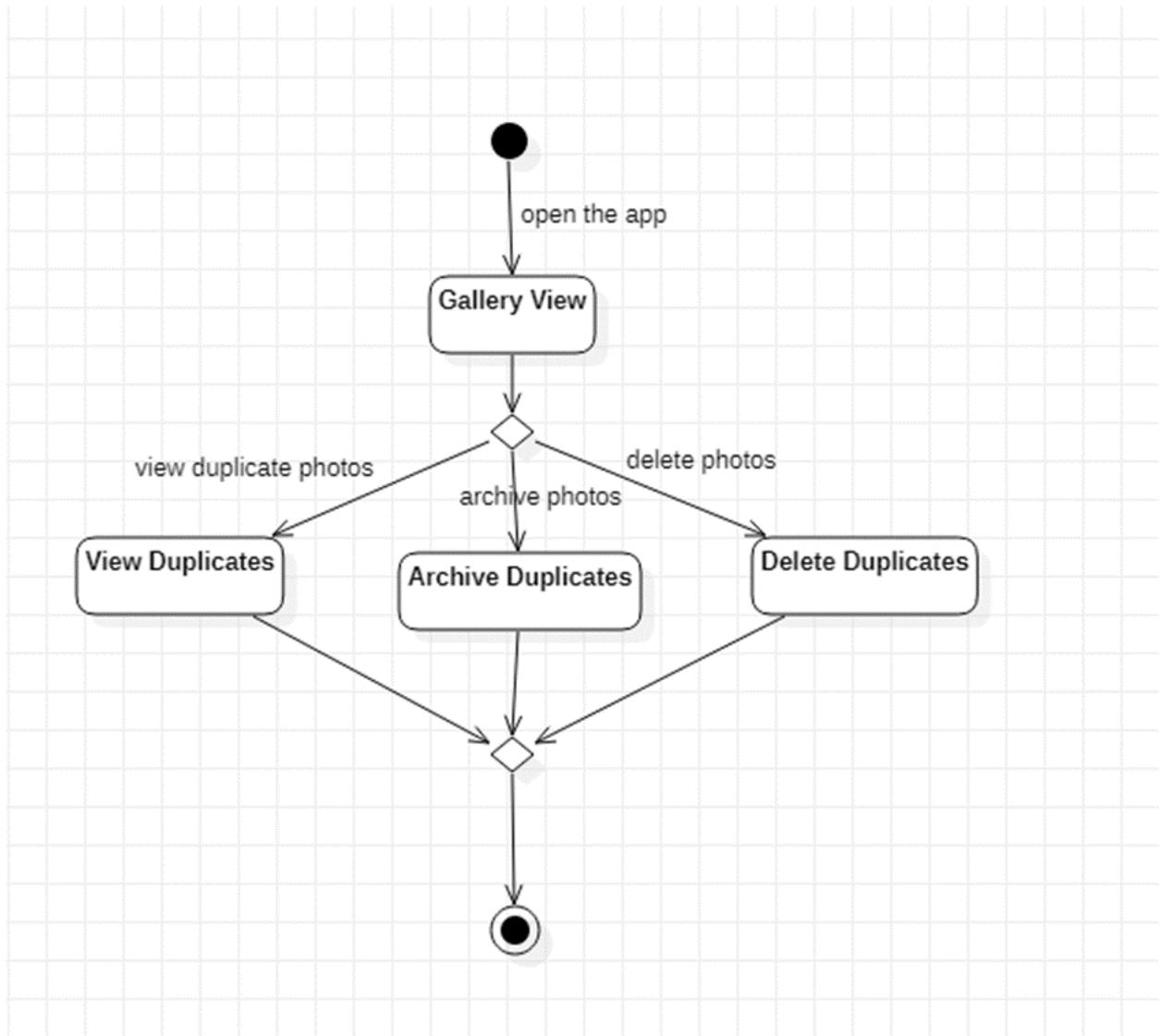
B. Tag Selection



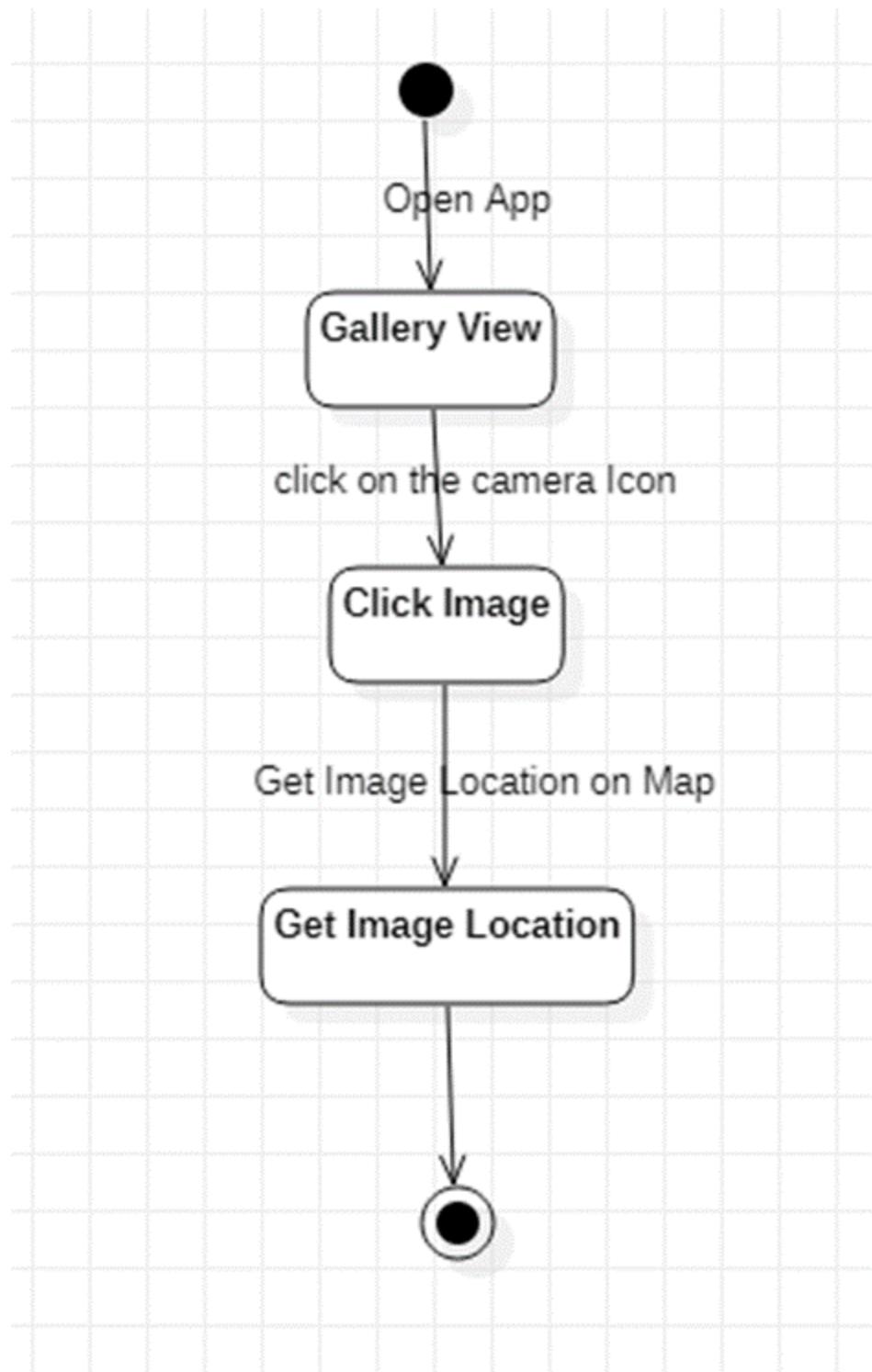
C. Search By Tags



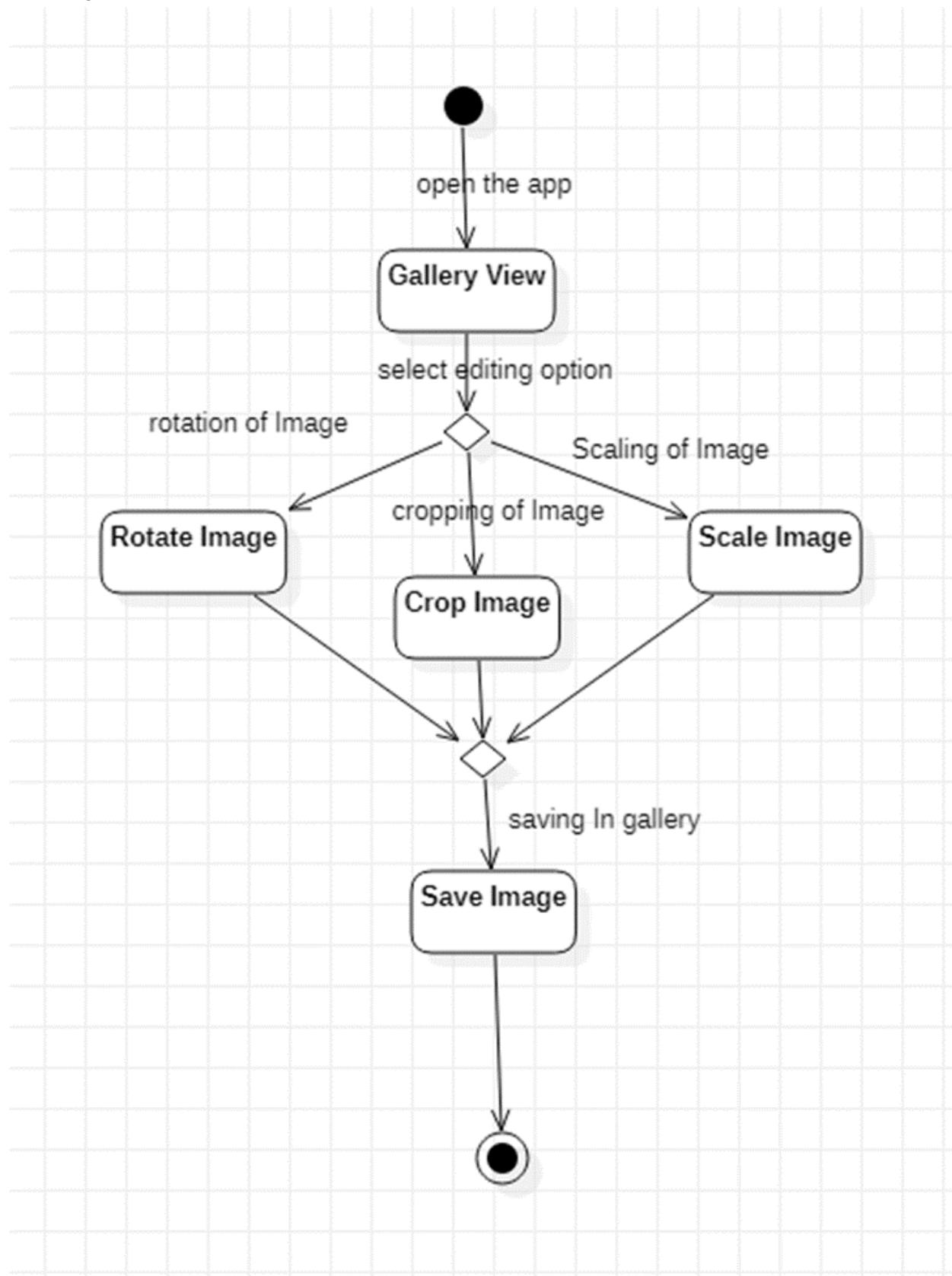
D. Duplicate Detection



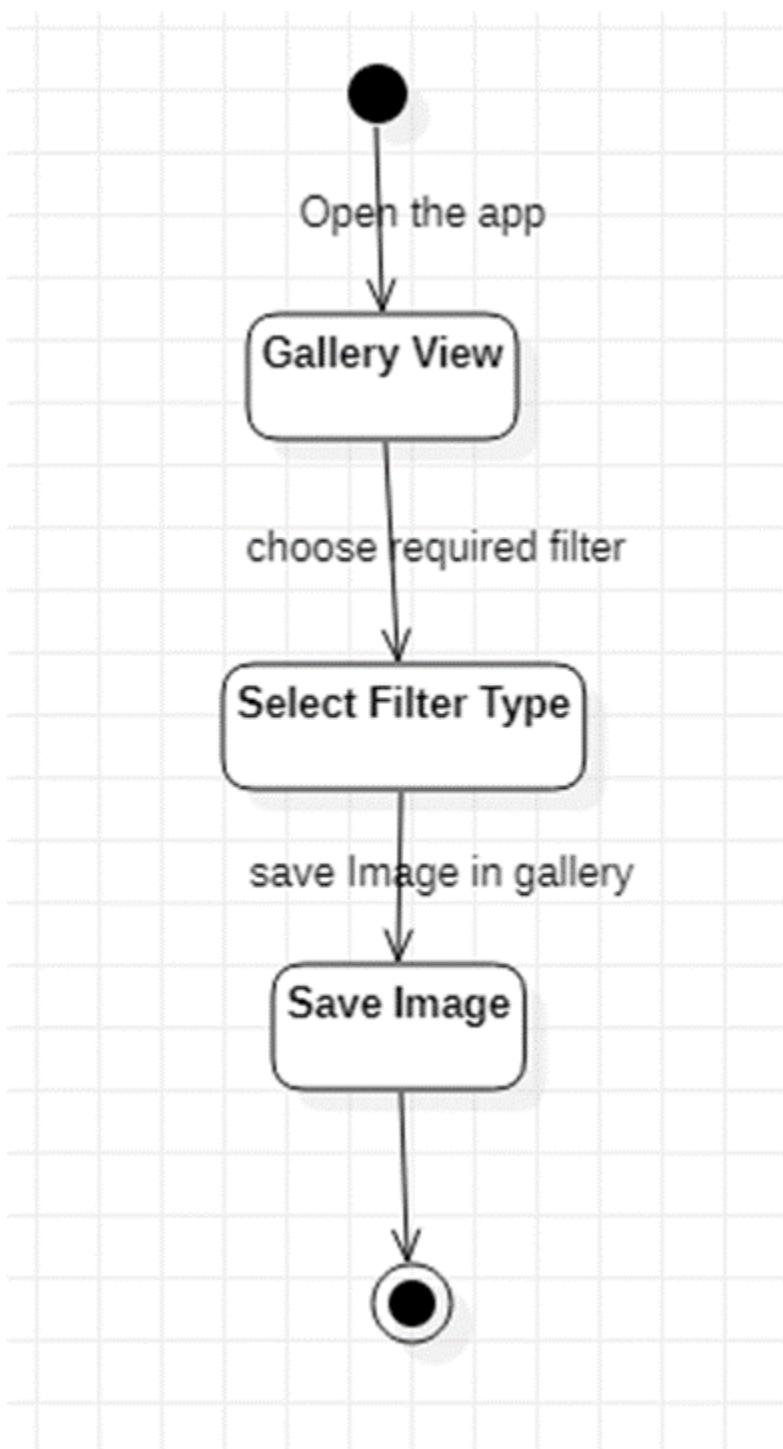
E. Geo Location



F. Edit Image

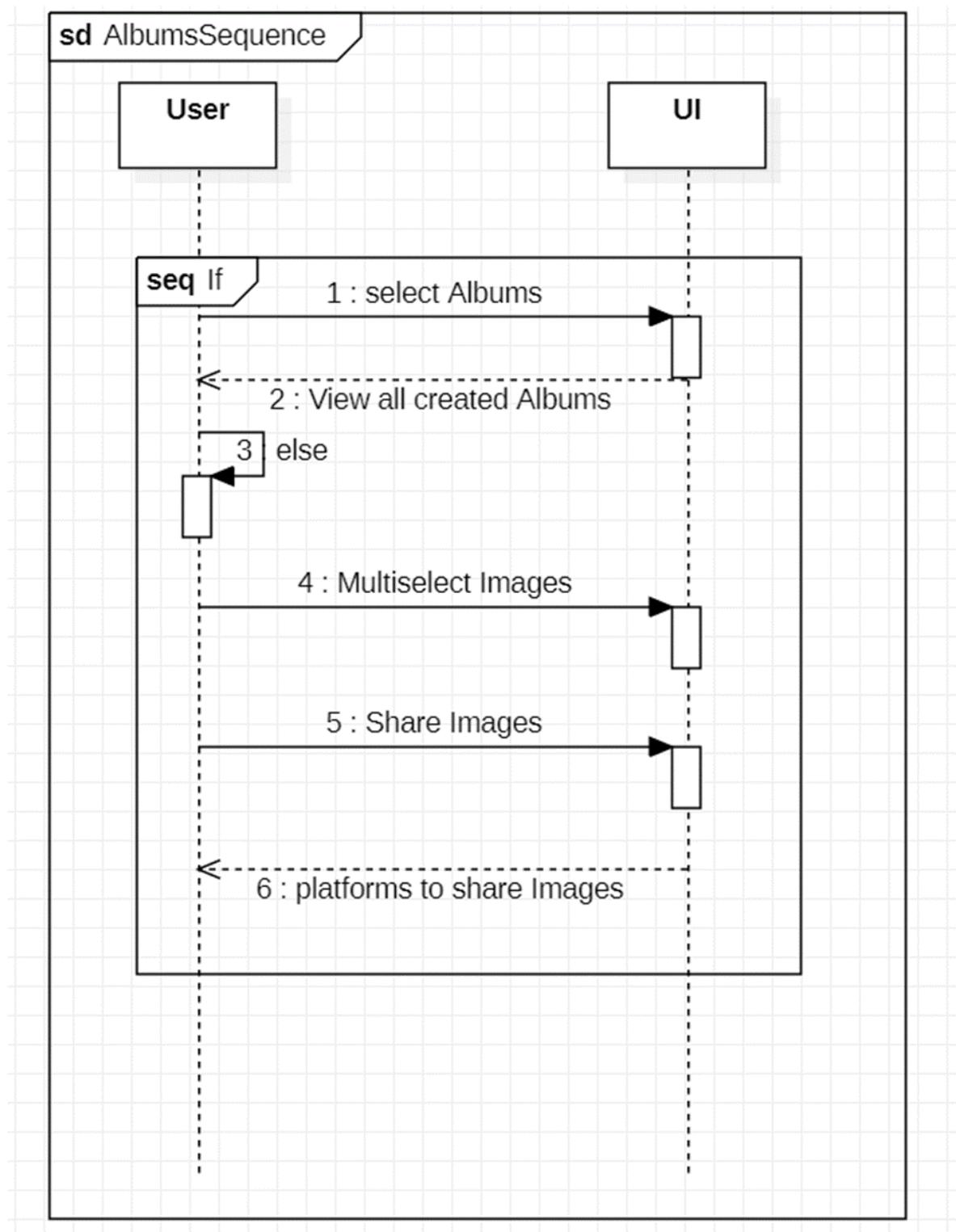


G. Filter Image

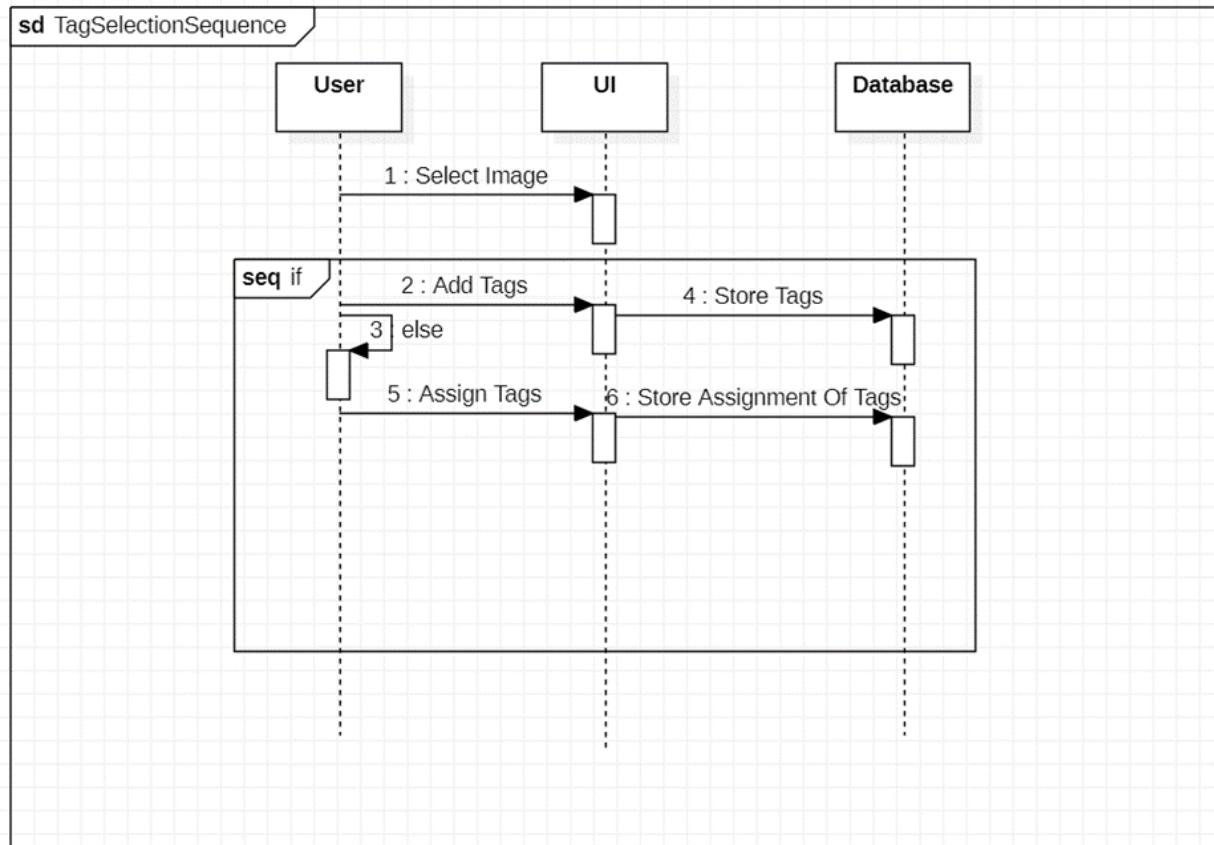


3.3 Sequence Diagram

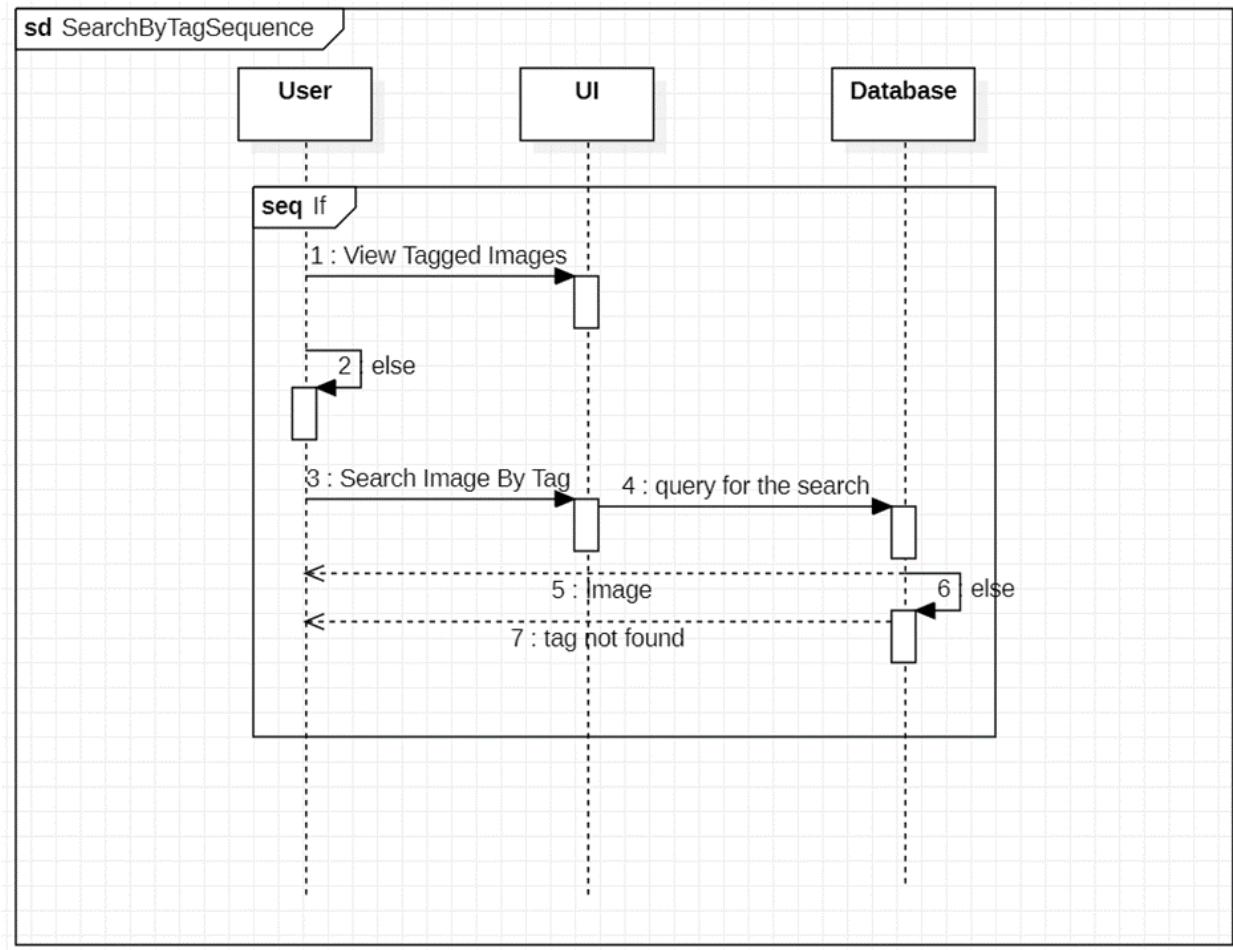
I. Albums



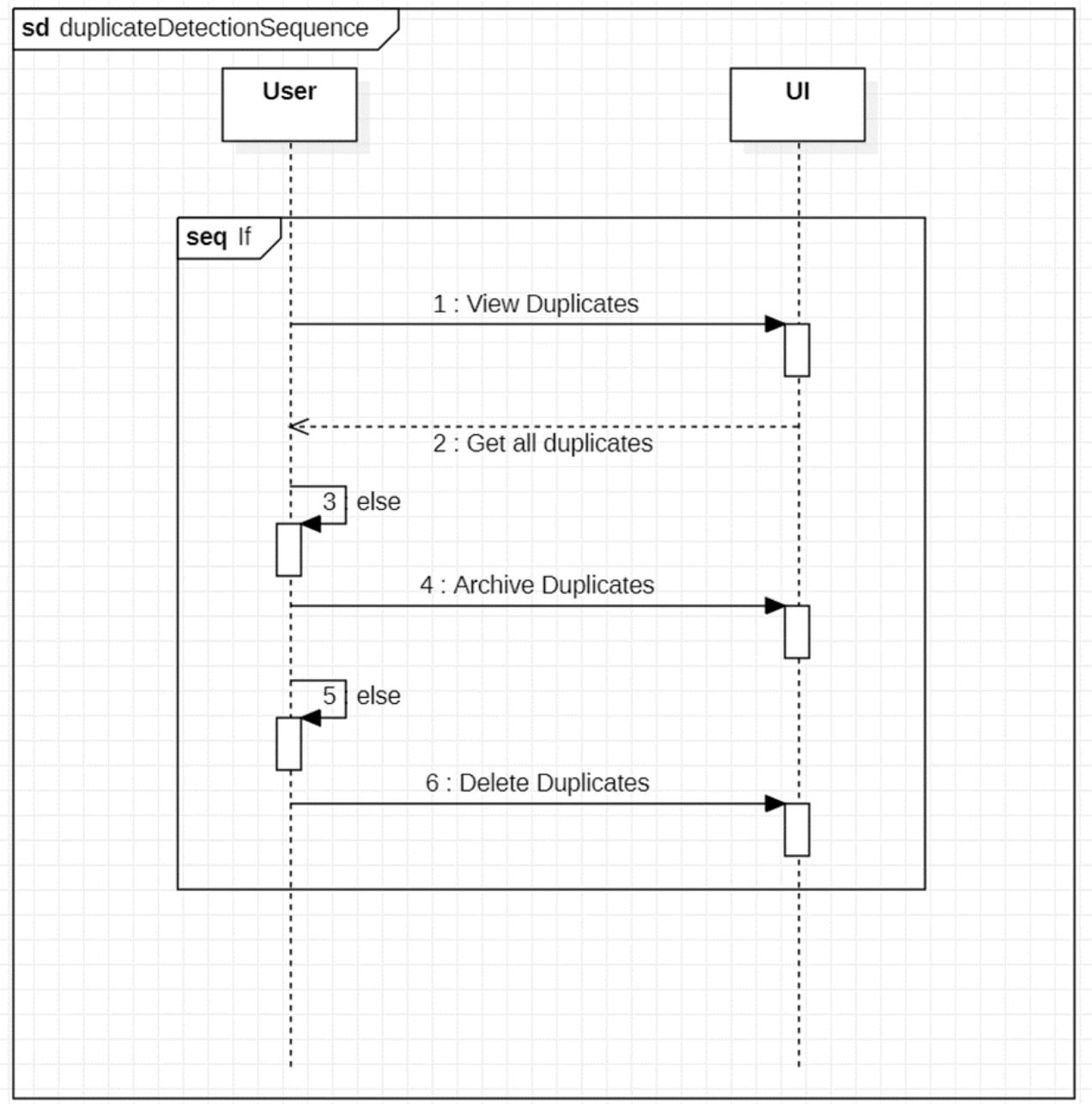
II. Tag Selection



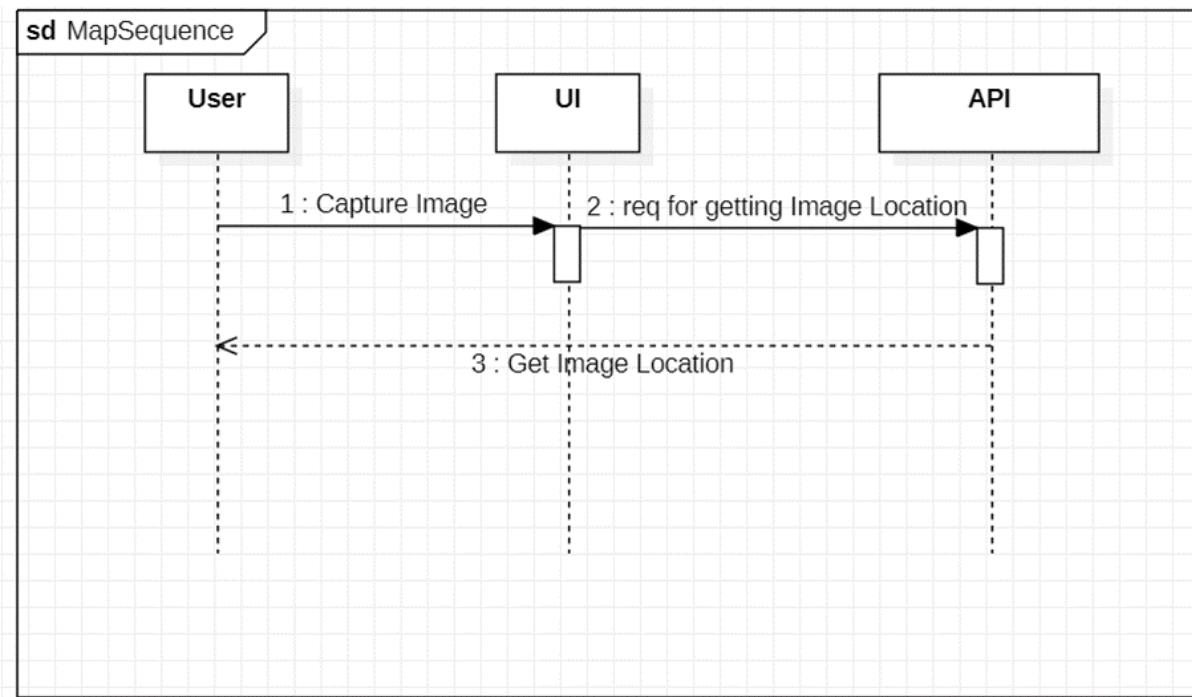
III. Search by Tags



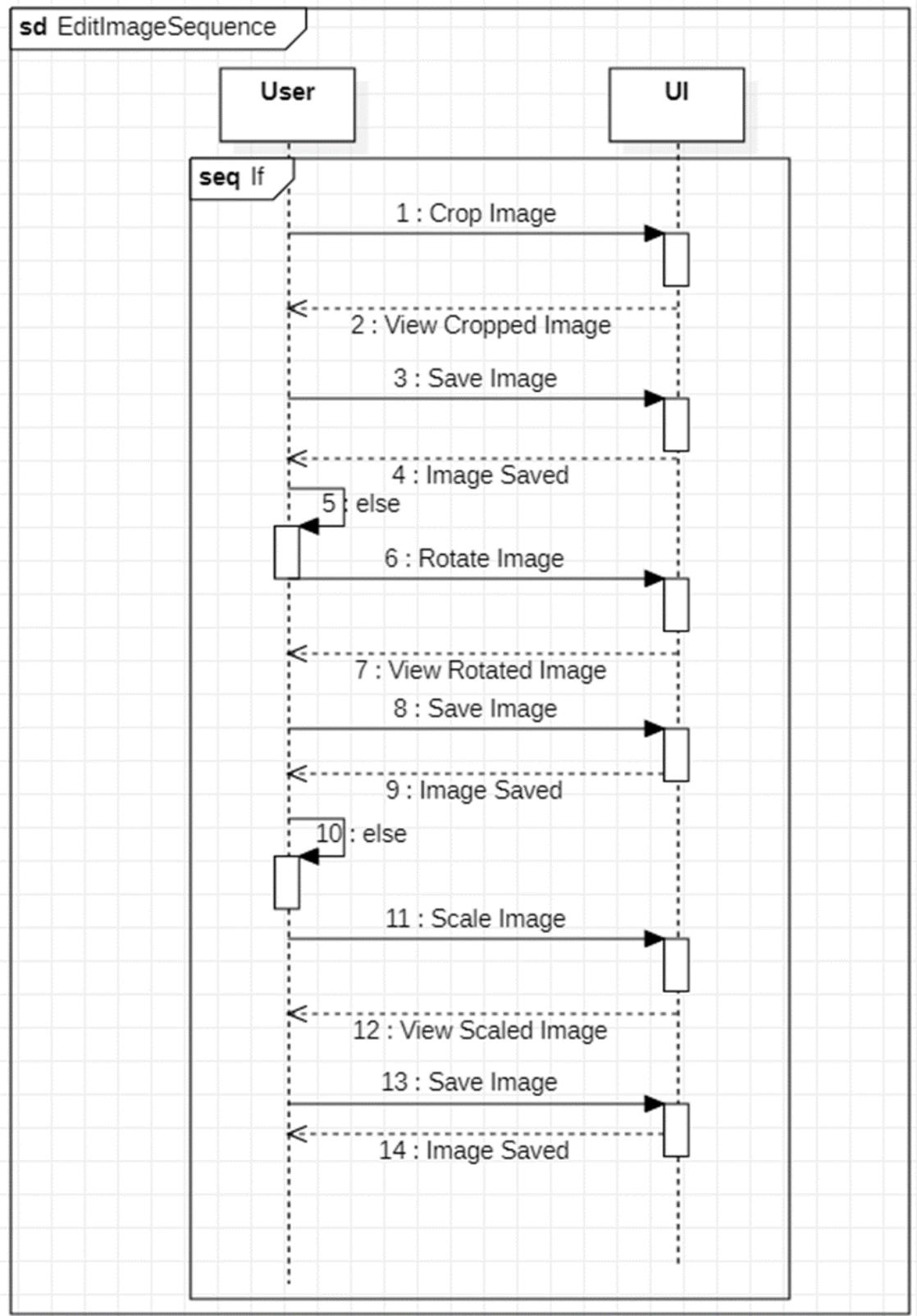
IV. Duplicate Detection



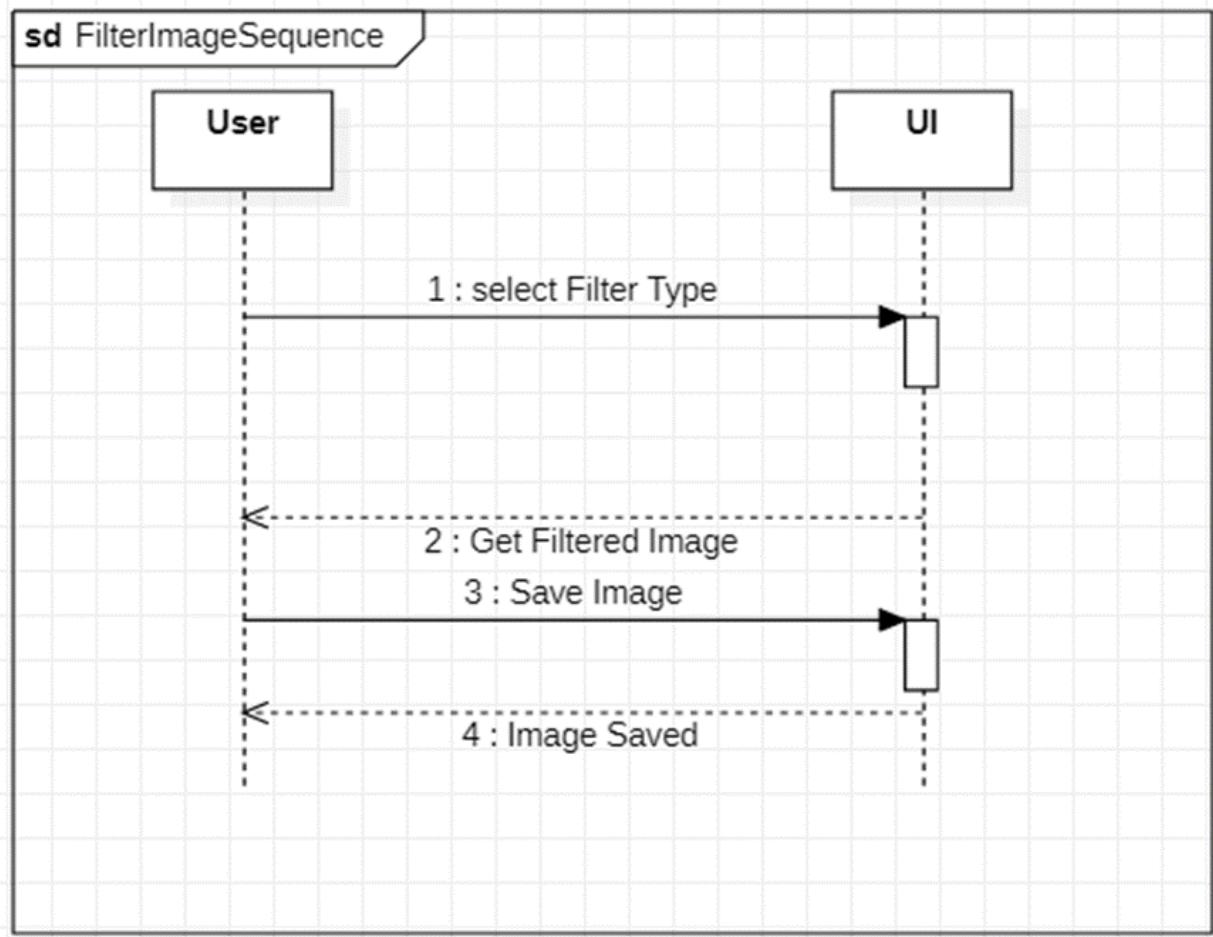
V. Geo Location



VI. Edit Image



VII. Apply Filter

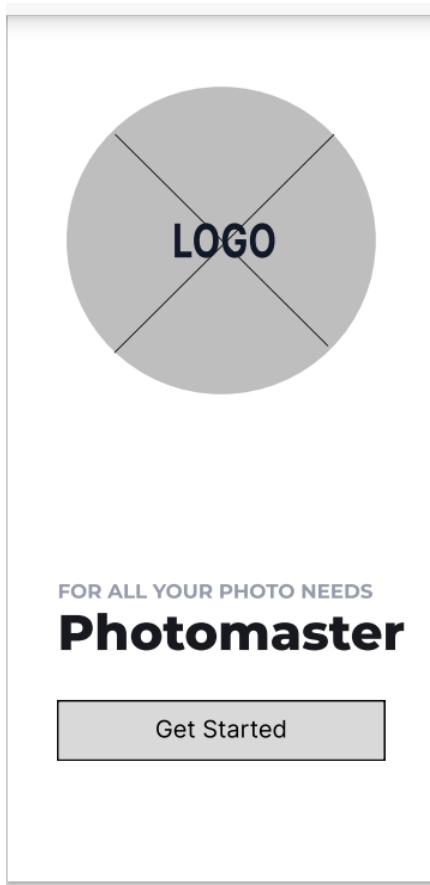


4. UI Specification & Design

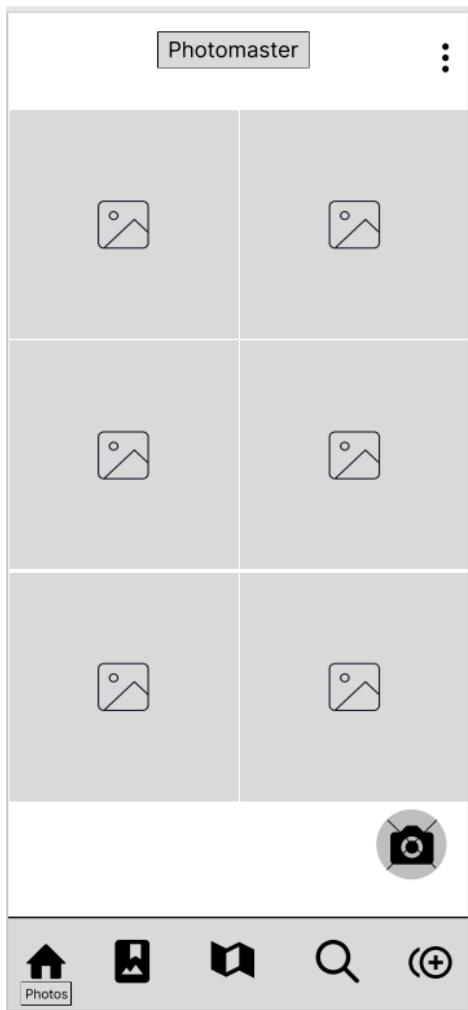
4.1 Wireframe

The wireframes were created to identify what elements will exist on each of the pages. The document contains mockups of each screen on the app

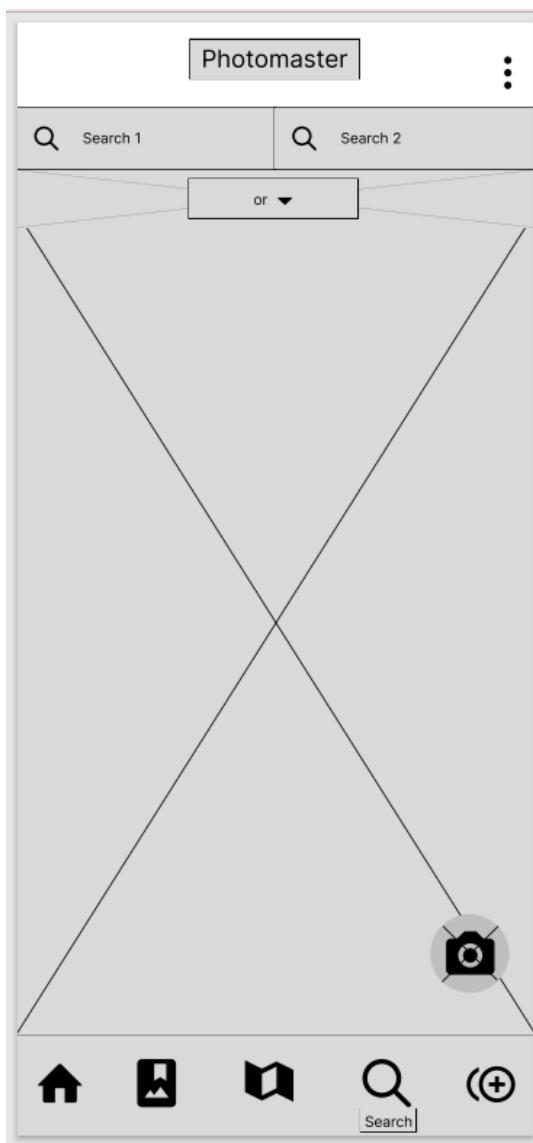
- a. Landing Page : consists of the logo of the Photomaster Application as well as the get started button to start the app



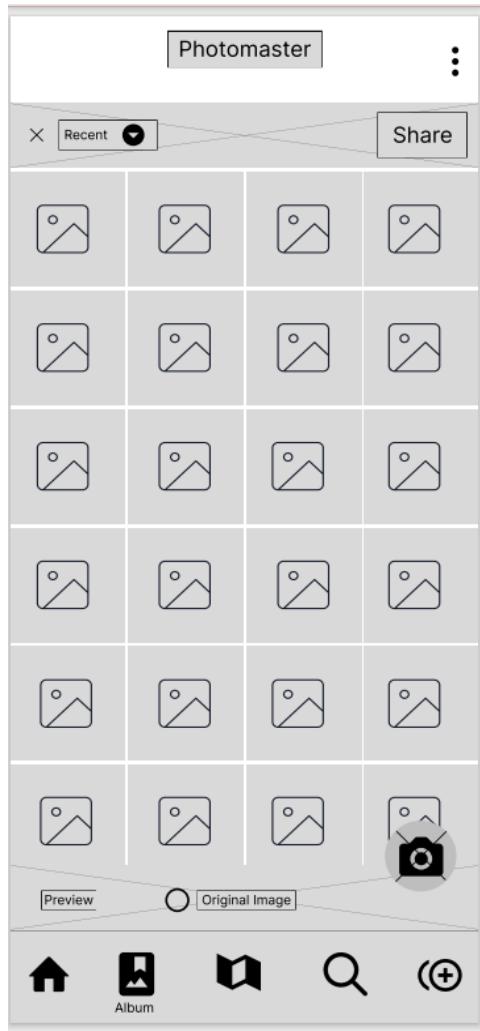
b. Home Page/Gallery: Contains the gallery view of all images present in mobile's storage, it is through the gallery view that users can add or remove tags and select image to enhance. The gallery view contains a bar at the bottom that is used to navigate through the different screens in the application. The Camera Icon at the bottom right of the screen enables user to capture images using the mobile camera.



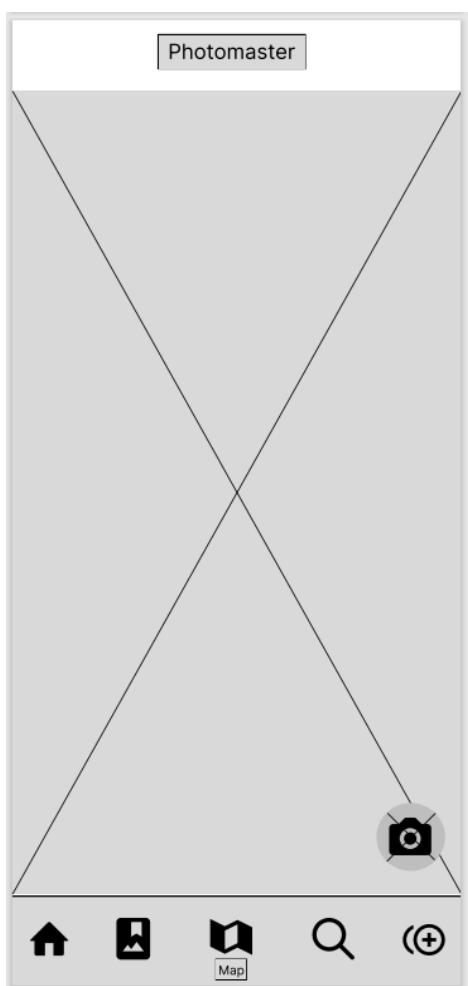
c. Search By Tags: This screen provides users with an option to search tags either together or separately. On querying the search the user is shown the results.



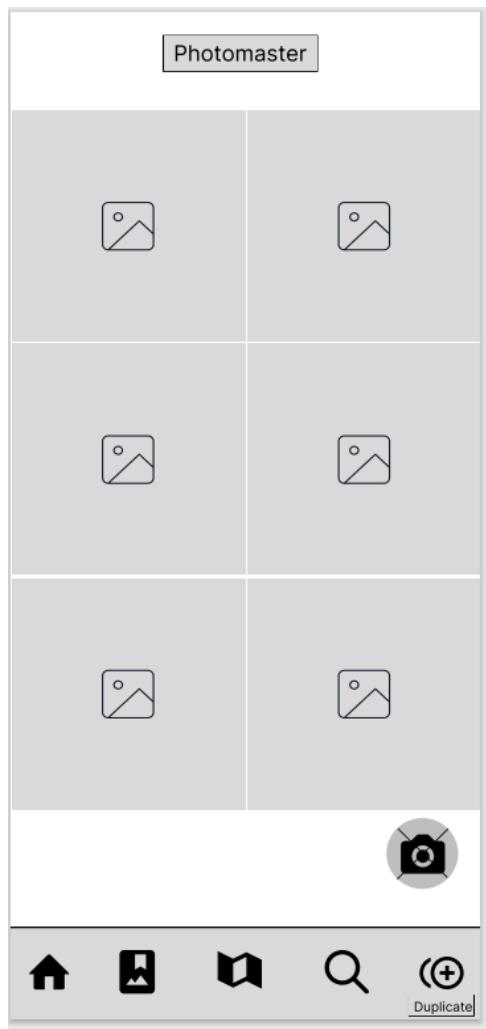
d. Albums: On the top left corner the user is shown the name of the album from the album list the user can choose which album it wishes to view, using the share button users can select images and upload it to various social media platforms



e. Geo Location: On capturing an image with the application the user is shown the image location on the photomaster app



f. Duplicate Detection: On selecting the duplicate detection option the application automatically scans through images and shows the duplicates.



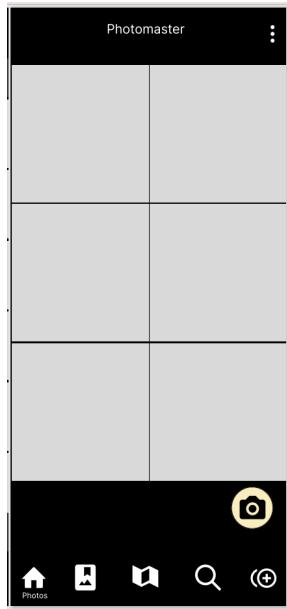
4.2 Preliminary Design :

Contains the final UI of the application complete with color schemes and all buttons needed, the UI captures all actions that will be performed on the app.

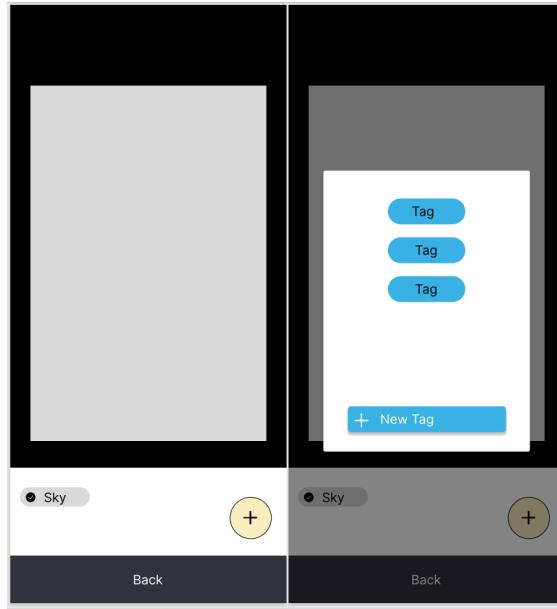
Main Screen



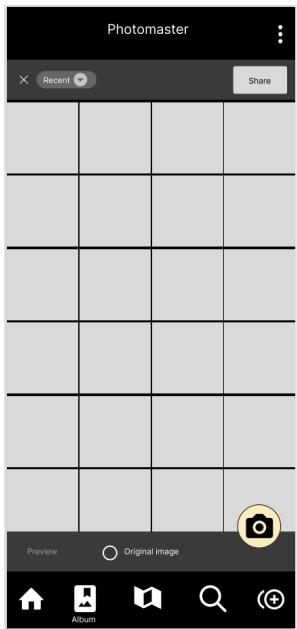
Home Page



Tagging Images



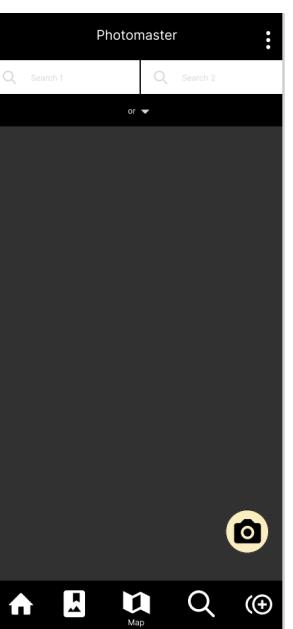
Albums



Geo Location



Search Tags



Duplicate Detection

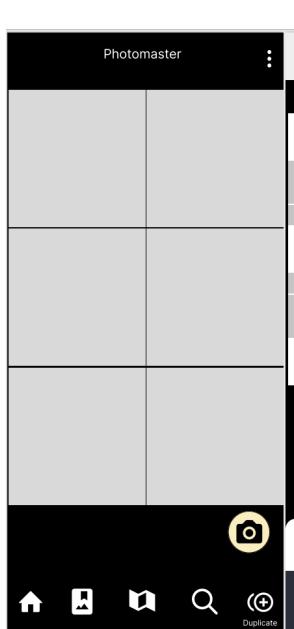
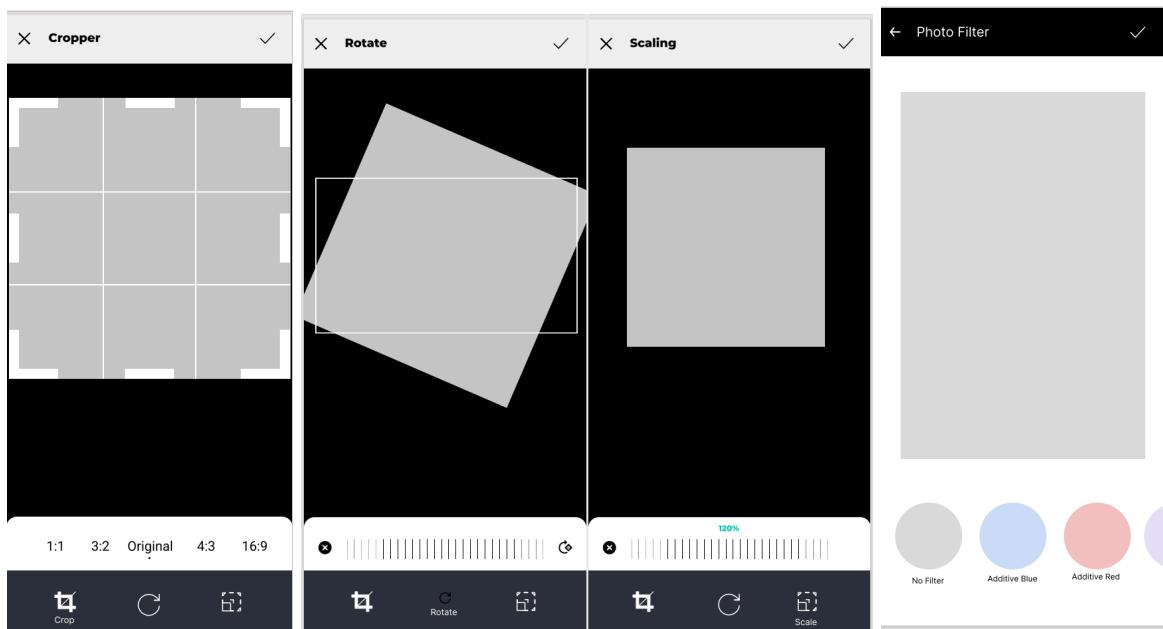


Image Editing: Crop, Rotate, Scale, Apply Filters



5. DESIGN OF TESTS

5.1 User Interface Testing

- a. Gallery : This is the home page of the application that displays all images from the users storage.
 - i. Test 1 – Load Images : This test ensures that after the required permissions are obtained from the user all images are loaded properly.
- b. Tagging : This is a very essential function of our app as it enables users to efficiently organize and access images in their galleries.
 - i. Test 1 – Creating Tags : The test for this use case is to primarily ensure that the user can create multiple tags and the input entered by the user is stored in the system database properly and displayed to the user.
 - ii. Test 2 - Tag Images : This test verifies that users are able to assign multiple tags to images and this assignment is appropriately recorded in the database
 - iii. Test 3 - Search Tags : This test checks if the input received by the user is read by the application and the appropriate response for it is generated, if the application does not find any images with the corresponding tags, it must provide no response.
- c. Albums : Allows users to view and export albums created to different social media sites, allows users to toggle between albums.
 - i. Load Albums : This test ensures that all albums created by the user are displayed in the application
 - ii. Share to social media : This test verifies that the images selected by the user are uploaded to the user specified social media platform
- d. Duplicate Detection : This feature enables users to declutter their gallery the application goes through all images present in the user storage and provides the user with the option of deleting or retaining the image
 - i. Test 1 – Duplicate Detection: This test ensures that the images returned are duplicates of each other and all duplicates are presented to the user
 - ii. Test 2 – Duplicate Deletion: This test ensures that after the duplicate images are detected the user is able to delete them
- e. Enhancements
 - i. Test1 - Crop, Rotate: This test ensures that on selection of an image users are able to crop/ rotate images according to their preference and save edited images in their gallery.
 - ii. Test 2 - Apply Filters: This test ensures that on selection of an image users are able to apply filters to images according to their preference and save edited images in their gallery.
- f. Geolocation
 - i. Test 1 - Geolocation : This test verifies that on capturing an image using the photo master app it's location is effectively captured on the map.

5.2 Integration Testing

Our integration testing has been done using big bang integration. Prior to compiling each individual sub part, we have conducted unit tests on individual pieces of software in order to validate methods and strategies so that we can eliminate logical errors and concentrate on technical errors that may occur as a result of integration. There aren't too many external dependencies and everything is relatively modular since everything has its own purpose and is independent of other aspects of the app so pinpointing issues wasn't an issue. Once the application is ready we shall perform usability tests to ensure it functions effectively.

5.3 Usability Testing

To check the usability of the photo master app, its user base was identified and a questionnaire was prepared

Users were then asked to use Photo master and provide their feedback with regards to the working of the app and suggestions for any future versions of the app

The App was used by 7 users and their feedback was used to identify issues with the application, the suggestions for new features as requested by the users has been outlined in the Future Scope part of the document.

The feedback form consisted of 10 questions, as under

1. How would you rate your experience with our app ? (Linear Scale 1 to 5)
2. How satisfied are you with the loading speed of the mobile app? (Linear Scale 1 to 5)
3. How would you rate the look and feel of the mobile app?(Linear Scale 1 to 5)
4. How would you rate the intuitiveness of the icons?(Linear Scale 1 to 5)
5. How likely are you to recommend Photomaster to a friend? (Linear Scale 1 to 5)
6. What feature did you expect but not find?
7. What do you like least about the mobile app?
8. What do you like most about the mobile app?
9. Did the app help you manage your gallery better?
10. Any Feedback / Suggestions

| How would you rate your experience with our app? | How satisfied are you with the loading speed of the mobile app? | How would you rate the look and feel of the mobile app? | How would you rate the intuitiveness of the icons? | How likely are you to recommend Photomaster to a friend | What feature did you expect but not find? | What do you like least about the mobile app? | What do you like most about the mobile app? | Did the app help you manage your gallery better? | Any Feedback / Suggestions |
|--|---|---|--|---|--|--|---|--|--|
| 4 | 5 | 5 | 4 | 3 | Everything there! | App size | Ui | Yes | Good |
| 4 | 3 | 4 | 4 | 4 | Editing the Contrast, vibrance, saturation etc | The loading screen when it searches for the duplicate photos | New feature like duplicate detection | Yes | - |
| 4 | 4 | 5 | 5 | 5 | . | . | Duplicate Detection | Yes | . |
| 4 | 3 | 4 | 5 | 4 | Multi tag search | Duplicate Detection takes time | Tagging functionalities | Yesss | Duplicate detection is slow rest is pretty good |
| 5 | 5 | 5 | 5 | 5 | 5 Nothing | Nothing | It doesn't need internet | Yeah | Duplicate detection is slow try optimizing that |
| | | | | | Recycle Bin for deleting pictures | Dupe Detect is slow | Dupe Detect | Yeah it's great | there's scope for a lot of interesting things to be add, see google photos, iphone gallery etc |
| 4 | 5 | 4 | 5 | 4 | Recycle Bin for deleting pictures | Dupe Detect is slow | Dupe Detect | Yeah it's great | Love the aesthetic |
| 4 | 3 | 5 | 5 | 4 | - | the app has no logo :(| Tagging is pretty cool | Yeah! | |

6. Future Scope

1. Hierarchical Tagging: Tags can be arranged in the form of hierarchies. E.g a tag named tree can have sub tags like branches followed by leaves.
2. Relations Between Tags: Tags can be queried together using and, not, or, xor functions.
3. Recycle Bin: Post Deleting images instead of directly removing them from memory, shift them to a recycle bin where they get deleted after 30 days.