



An-Najah National University

Faculty of Engineering & Information Technology

Department of Computer Engineering

Graduation Project 1



PHOTOGENIC

EMOTIONS THROUGH PHOTOS

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Presented in partial fulfillment of the requirements for
Bachelor degree in Computer Engineering

Jan – 2023

Acknowledgment

It is our pleasure to dedicate who supported us in completing this work. Words cannot express our gratitude to our supervisor Dr. Emad Natsheh for his invaluable patience and feedback. Also, we are grateful to our families and friends for their moral support and inspiration. Last but not least, all thanks and gratitude to those who lend a hand.

Disclaimer

This report was accomplished by Marah Sha'bello and Dua'a Braik at the Computer Engineering Department, Faculty of Engineering, An-Najah National University. The views expressed in this report are sole of the authors' own and do not reflect the view of An-Najah National University, Department of Computer Engineering.

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Abstract

Photographers use social media apps daily to show their work and face many problems when uploading photos, in which they may not reach the targeted audience. In addition to that, booking photoshoots on chats are impractical for both clients and photographers and could end with misunderstandings and delays.

Photogenic comes to bring different features and combine everything related to photography in one place. Also, it helps photographers to upload their pictures so clients can interact with them, which will help photographers reach more audiences, in addition to their ability to announce photography workshops and events with all of their details, including a map to highlight the location. Also, clients can book a photoshoot according to the photographer's schedule, and immediately it will be added to the photographer's calendar, then a notification will be sent to the photographer. Photogenic also provides chats to connect the photographers with their clients and recommends photographers to the users to follow based on their interests. Finally, users can search for photographers by their usernames or domain.

First Chapter

1. Introduction

1.1 Problem Statement

Nowadays, booking photoshoots with photographers is becoming popular and trendy. And with the fast-increasing number of customers, the photographer may face some challenges or difficulties in dealing with them without conflicts. Also, it may be time-wasting for the photographer to give his available times to every customer individually. Also, social media and chat systems become impractical for bookings and may lead to misunderstandings and delays.

In addition to that, photographers may not have enough time to respond to all the messages, which ends in losing customers.

On the other hand, customers need to have all the photographers in one place without wasting time looking for the best one, and booking a photoshoot without any delays.

1.2 Objectives and scope

Photogenic has multiple features that benefit both photographers and customers to make booking a photoshoot smooth and practical. Photographers add a clear schedule with the available times to make it user-friendly for the customer to choose a suitable time and date.

1.3 Report Organization

The second chapter (Constraints and Earlier Coursework):

Describe the constraints we faced and the university courses that help us while working on photogenic.

The third chapter (Literature Review):

Discuss the main features of other similar mobile applications and the difference between these applications and photogenic.

The fourth chapter (Methodology):

Describe the process of working on photogenic starting from the database, moving to the system design and UI, and the main features of photogenic with details.

The fifth chapter (Results and Discussion):

Discuss the results and features photogenic have.

The sixth and last chapter (Conclusion):

Give a small summary of the main feature of photogenic and the basic concepts used.

Second Chapter

2. Constraints and Earlier Coursework

2.1 Objectives and scope

- The photographers' data were collected from different resources because it was hard to find the information and photographers' data in one place.
- Most professional photos have a license or copyright.
- Google Maps does not always show clear and appropriate addresses and locations in Palestine.

2.2 Earlier Coursework

- Object-Oriented Programming (JAVA)

Writing object-oriented code was an essential skill because we use dart, which is an object-oriented programming language.

- Database Design & Management

Photogenic uses MySQL as a relational database and firebase as a non-relational database.

- Critical Thinking and research methodology

The critical thinking course helps us to be aware of the research principles, methodologies, and scientific writing.

Third Chapter

3. Literature Review

The idea of this application was inspired by different real-world applications, in which each of them has one of the features it has, and here are some of them:

- a. **500px:** It is an application that allows photographers to show their work and projects, and has galleries classified by categories that contain photos of different photographers around the world.

Advantages:

1. It makes it easy for photographers to share their work as posts or galleries.
2. Photos are classified based on their categories

Disadvantages:

1. It doesn't connect the photographer to their customers as it doesn't have chats
2. All users can upload photos which might result in uploading non-professional photos.

- b. **shootingrent.com:** It is a website that allows photographers around the world to add their available times and all other details related to photoshoots, to let customers choose a day and time to book a photoshoot.

Advantages:

1. It shows the available photographers for different locations around the world, and users can view their previous work.

Disadvantage:

1. It doesn't include chats, and this means that the photographer and the customer will use another application to communicate and set deals.
2. Photographer's schedule isn't clear because it doesn't show if the chosen time is truly available or not.

What makes PhotoGenic stand out from other examples and applications?

PhotoGenic is the only application that has all the features combined in a single place, and it was designed to help both photographers and customers to reach their target, as it recommends photographers to other users based on their type of photography and their location, which will help them to show their work and shots to the targeted audience and will help customers to search and look for the best photographer to fulfill their needs and prospects.

Also, it creates a customized experience for both users, and uses their interests to show photographers and photos of the same fields. It also makes the process of photoshoot booking easier and more practical through the calendar it provides, in which the photographer can easily add their schedule to. Furthermore, it includes a chat system that eases the communication between the photographer and the customer.

Fourth Chapter

4. Methodology

4.1 Database design

Photogenic is built primarily with a relational database which is MySQL, because of the requirements of the project and the relations between its entities.

The database design can be summarized as follows:

- 1) All entities are identified and determined from the requirements, and each entity forms a table in the database, including photographer, client, post, event, and calendar.
- 2) Relations between the tables are set and identified in a form of primary keys, foreign keys, and bridge tables, as follows:
 - a. **One-to-One:** the relationship between a photographer and their calendar, each photographer has one calendar, and each calendar belongs to a single photographer.
 - b. **One-to-Many:** the relationship between a photographer and their posts, each photographer can have multiple posts, but each post belongs to a single photographer.
 - c. **Many-to-Many:** the relationship between photographers and customers. Each photographer can have multiple followers and a customer can follow multiple photographers.

But the chat feature requires a non-relational database which is Firebase, and it is structured as follows:

- 1) **Chats collection:** each chat has a chat ID that represents all the documents that have all messages in this chat.
- 2) **Users collection:** a collection of all users, and each user has all of their contacts and the chat ID for each one of them.

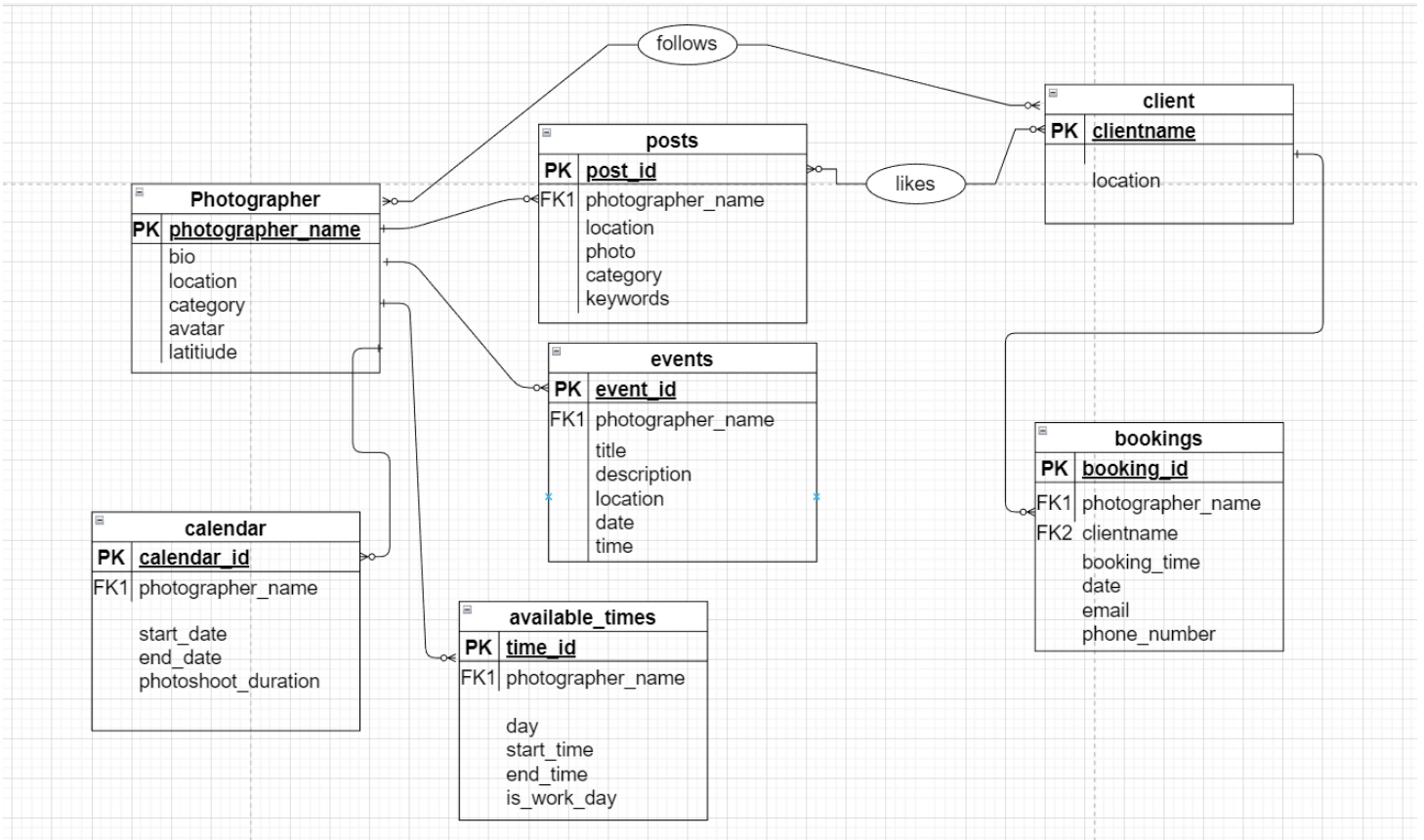


Figure 4.1 Entity Relationship (ER) Model

4.2 System features and design

Photogenic consists of 22 user-friendly screens.

4.2.1 Welcome Screen

The welcome screen shows the logo of photogenic and two buttons that allow the user to log in to his account if he already has one or sign up to create a new account in photogenic.

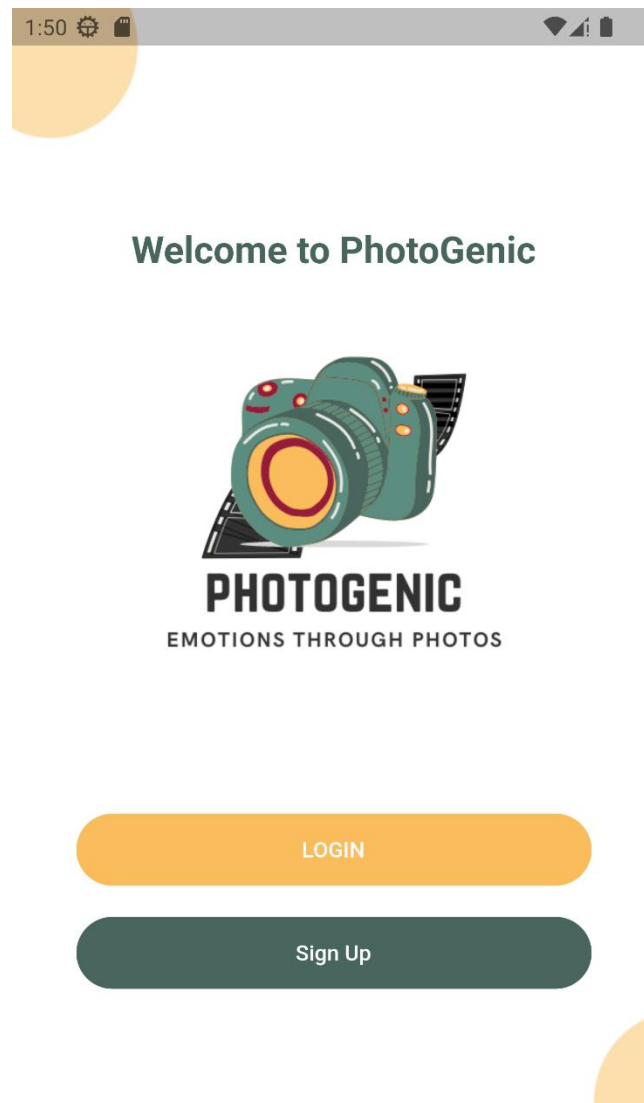


Figure 4.2.1: Welcome Screen

4.2.2 Login Screen

The login screen contains two text fields to insert the username and password and a button to enter successfully and move to the home screen. If the password is forgotten, the user can have a new password. If the user does not have an account, he can move to the signup screen to create one.

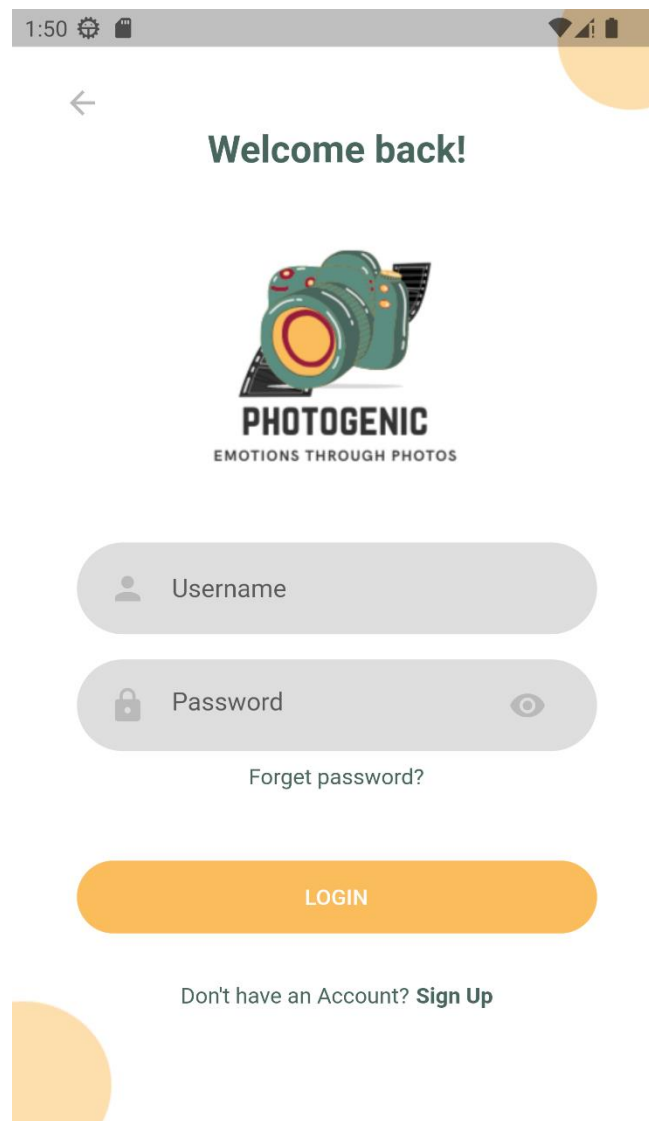


Figure 4.2.2: Login Screen

4.2.3 Signup Screen

The signup screen contains three text fields to add a username, create a password and confirm the password. Then, choose the account type (photographer or client) and click on the button to move to the next step in the process. If the user already has an account, he can move to the login screen by clicking on (Sign In).

There is another signup page only for photographers to add more information about their type of photography and a description of their work.

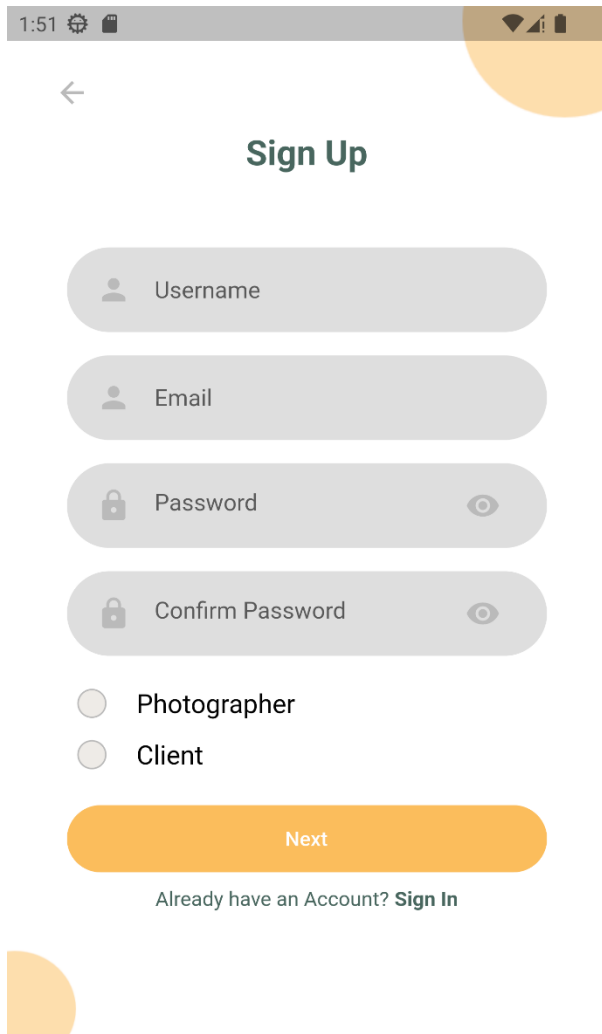


Figure 4.2.3.1: Signup Screen

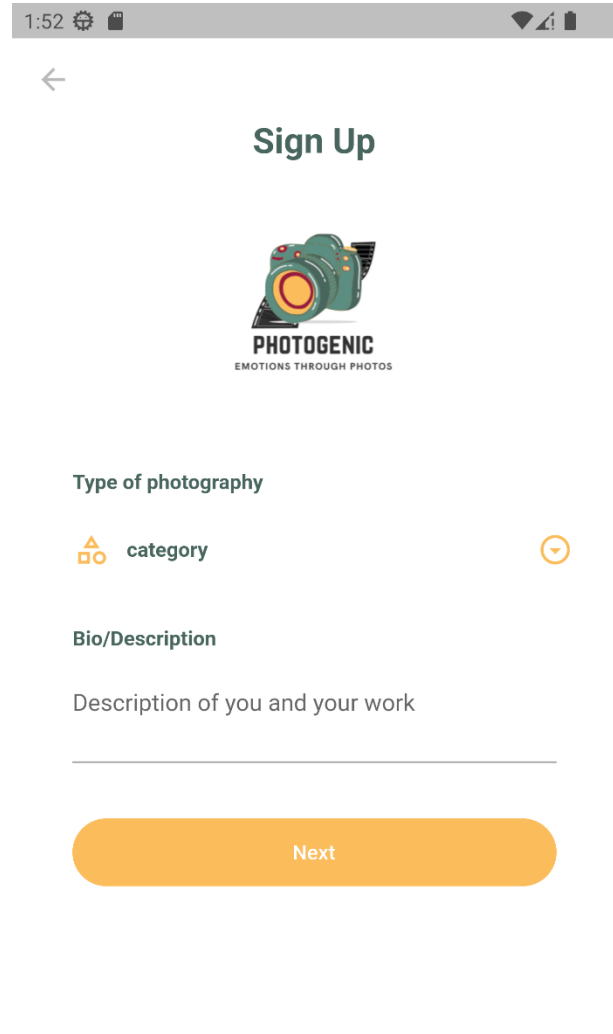


Figure 4.2.3.2: Signup page II for Photographers

After signing up and adding all the information, photographers and clients can choose at least three categories from their interests. Then, according to their interests, a list of photographers is displayed.

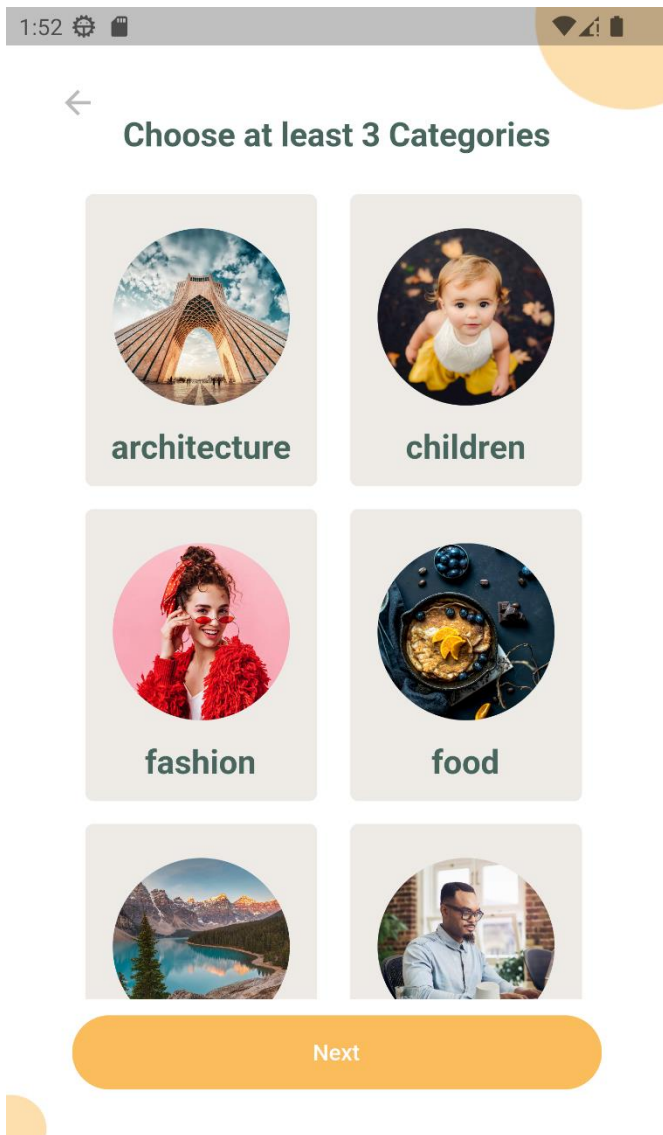


Figure 4.2.3.3: Choose Categories

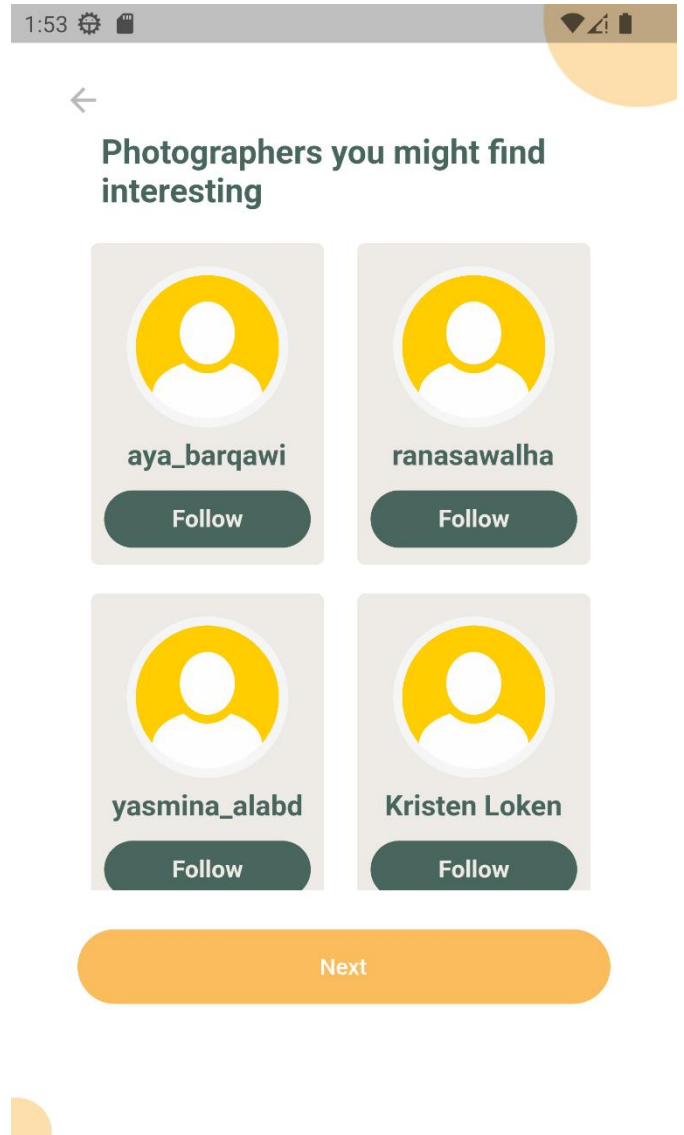


Figure 4.2.3.4: Add Photographers

4.2.4 Home Screen

The home screen consists of a footer that contains (home, discover, notifications and events), a header that contains chat and profile icons to move to these screens, also a drop-down list to filter the posts in the home screen as most recent posts and trending posts.

In the most recent posts section, the posts from the following list only will be rendered. And in the trending posts section, the most trending posts will be rendered, not necessarily posts from the following list.

Also, there is a button appears for the photographers only to add a post or event.

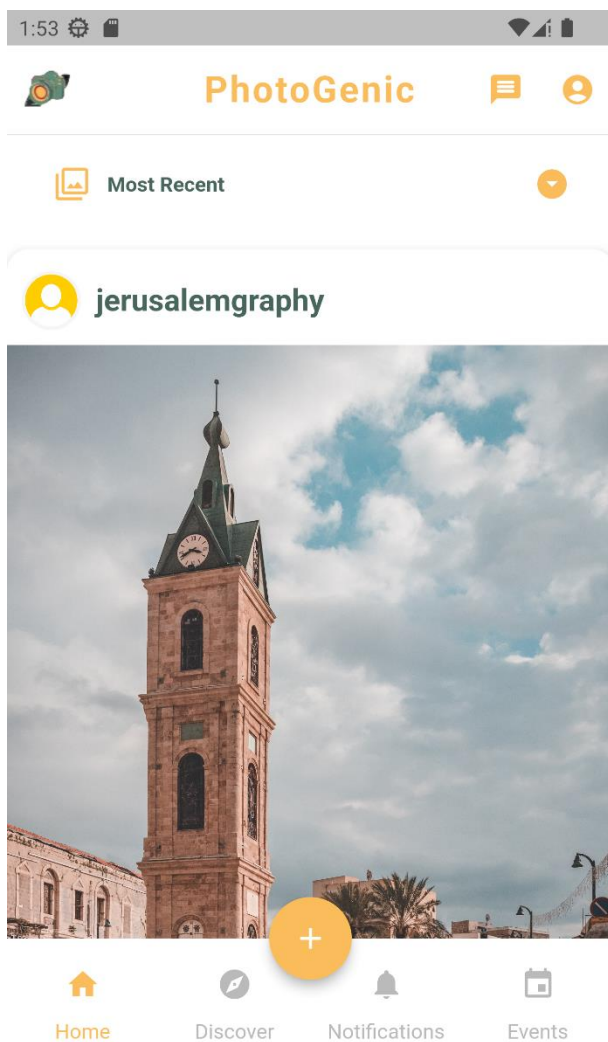


Figure 4.2.4.1: Home Screen

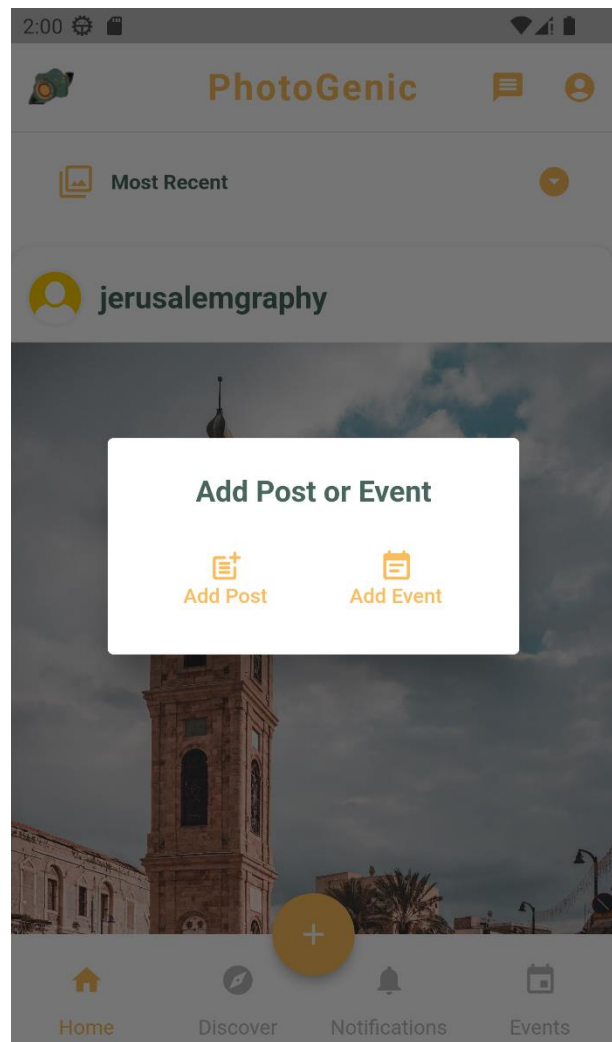


Figure 4.2.4.2: Add post or event

After clicking on (Add Post), the photographer can upload a photo and then add some information and description about it. Also, the photographer can add the location, then upload the post.

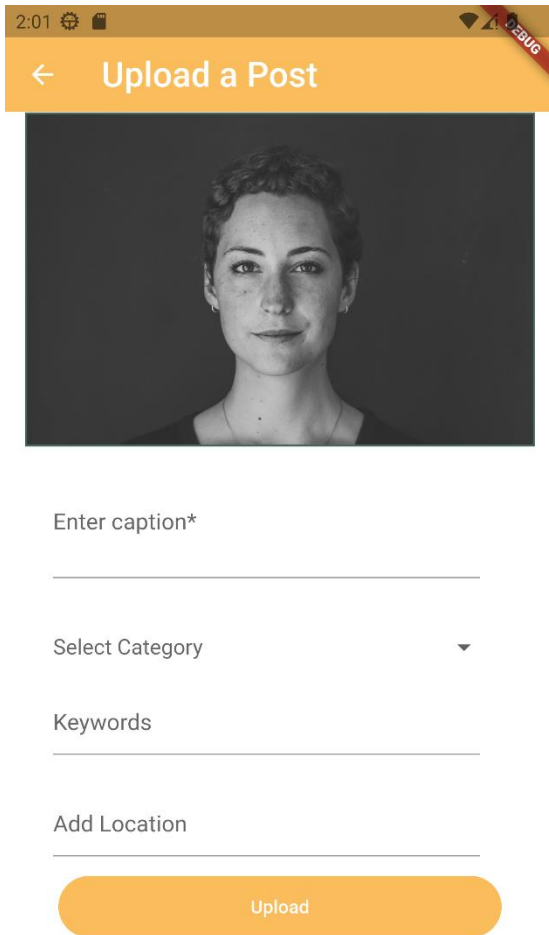


Figure 4.2.4.3: Add post

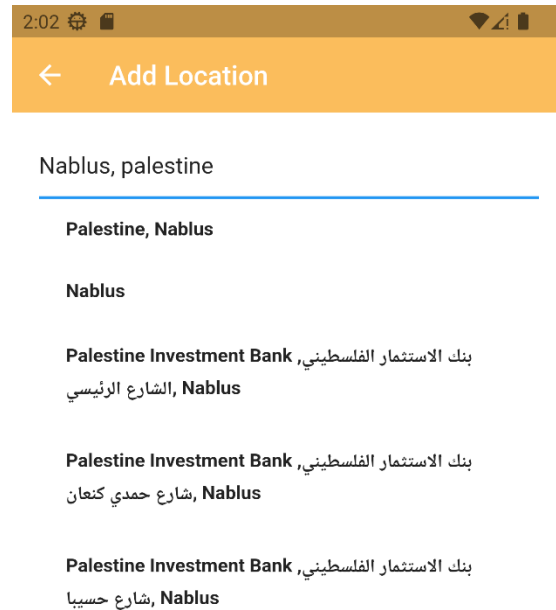


Figure 4.2.4.4: Add location

After clicking on (Add Event), the photographer can add the event name, date, time, location and a description about the event. Also, when adding the location, the (Add Location) page will open.

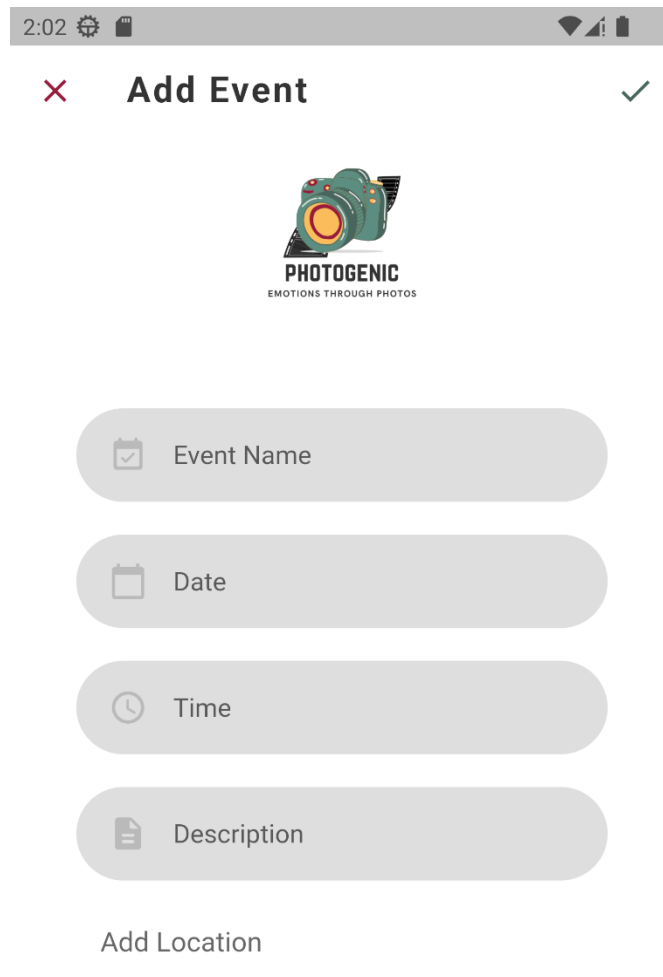


Figure 4.2.4.5: Add event

The chat screen displays the communications between client-to-photographer and photographer-to-photographer. So, the user can send and receive messages.

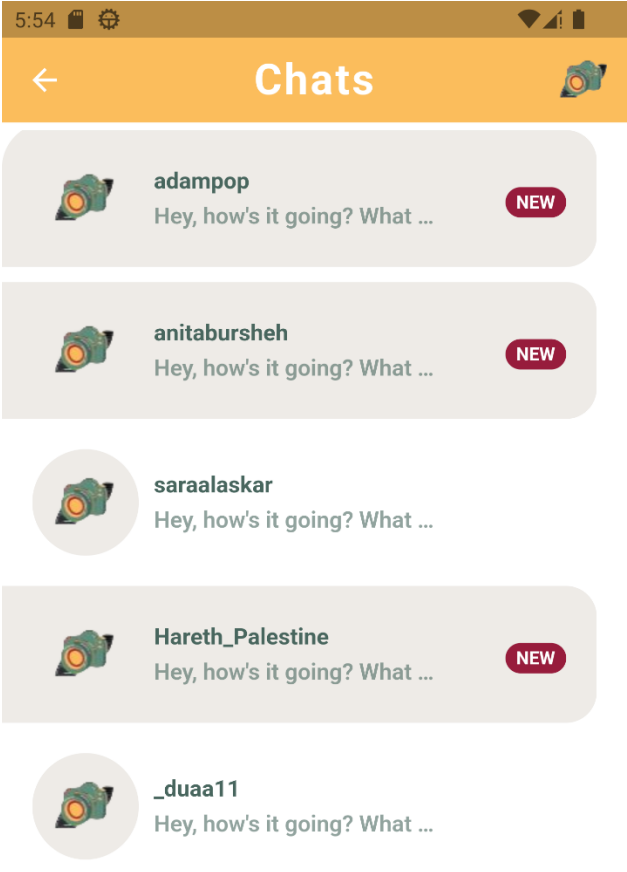


Figure 4.2.5.1: Chats Screen

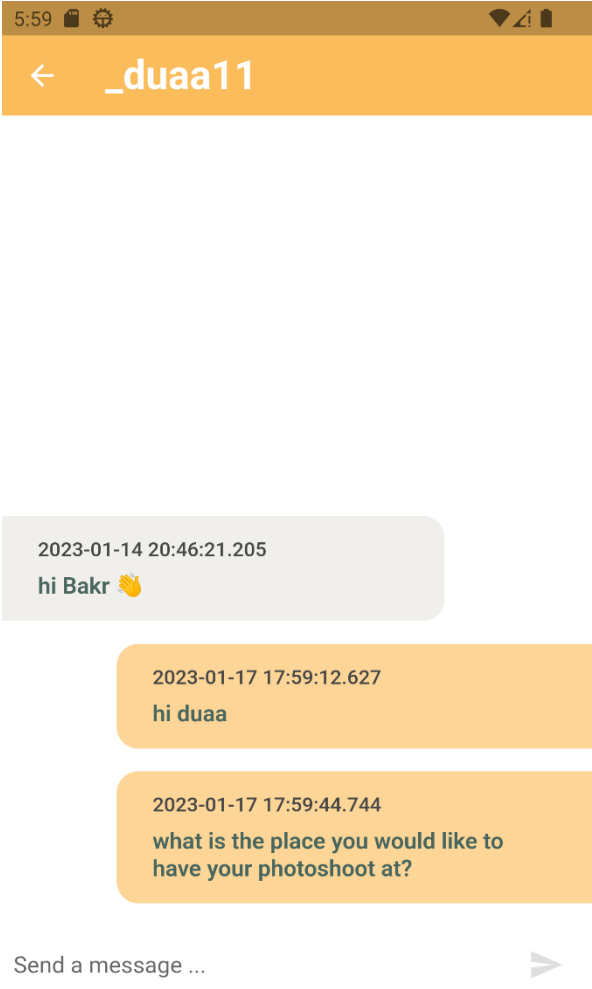


Figure 4.2.5.2: Single chat

4.2.6 Discover Screen

The discover screen has two tabs. The first one recommends categories, and the other one recommends photographers.

This screen is also for both photographer and client.

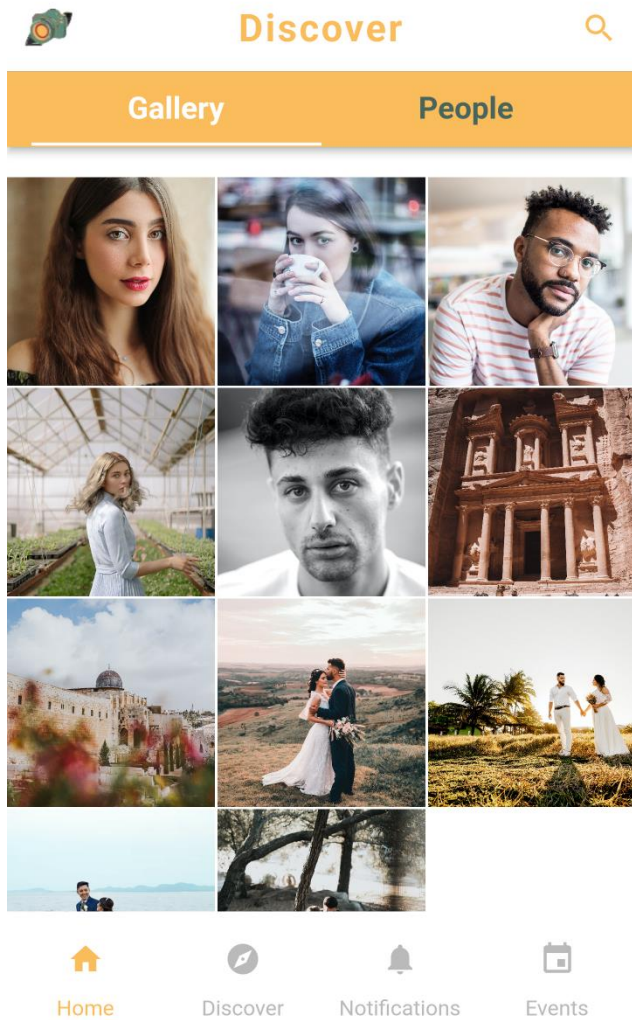


Figure 4.2.6.1: Discover Gallery

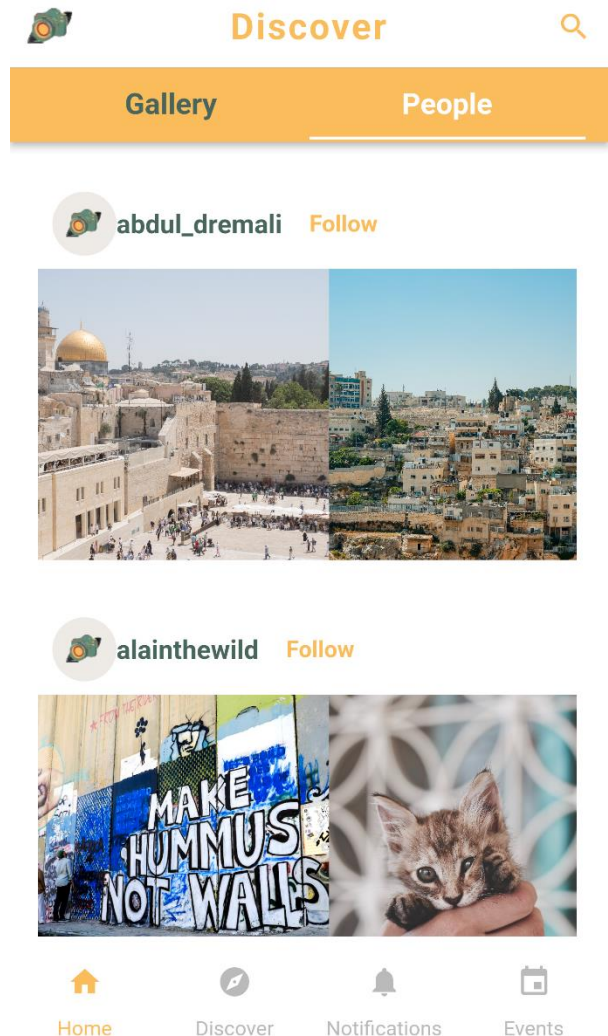


Figure 4.2.6.2: Discover Photographer

The search bar allows the users to search by photographer, category, or location.

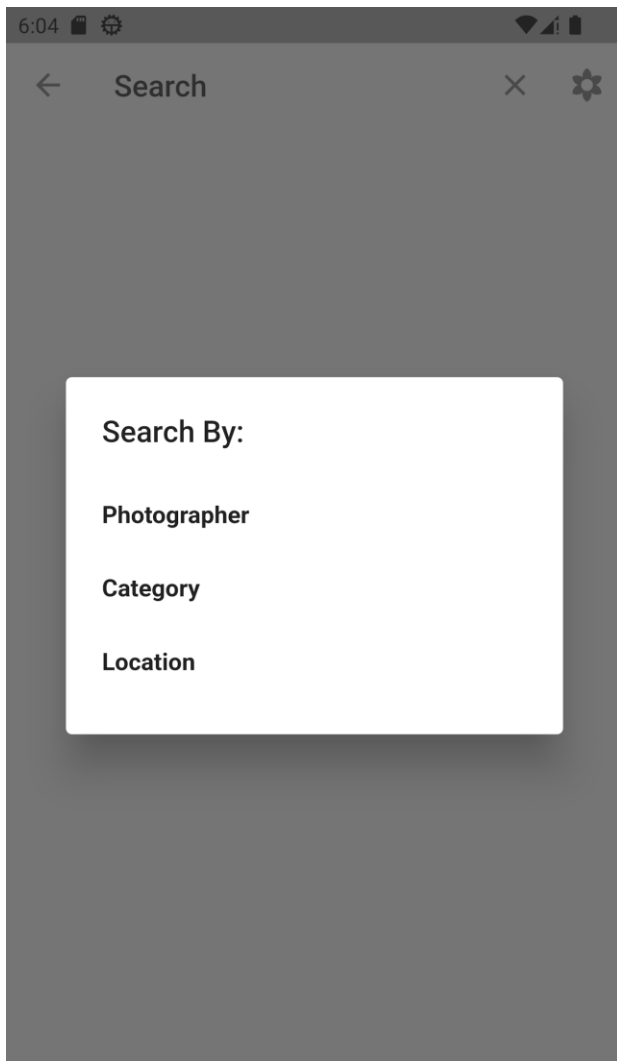


Figure 4.2.6.3: Search types

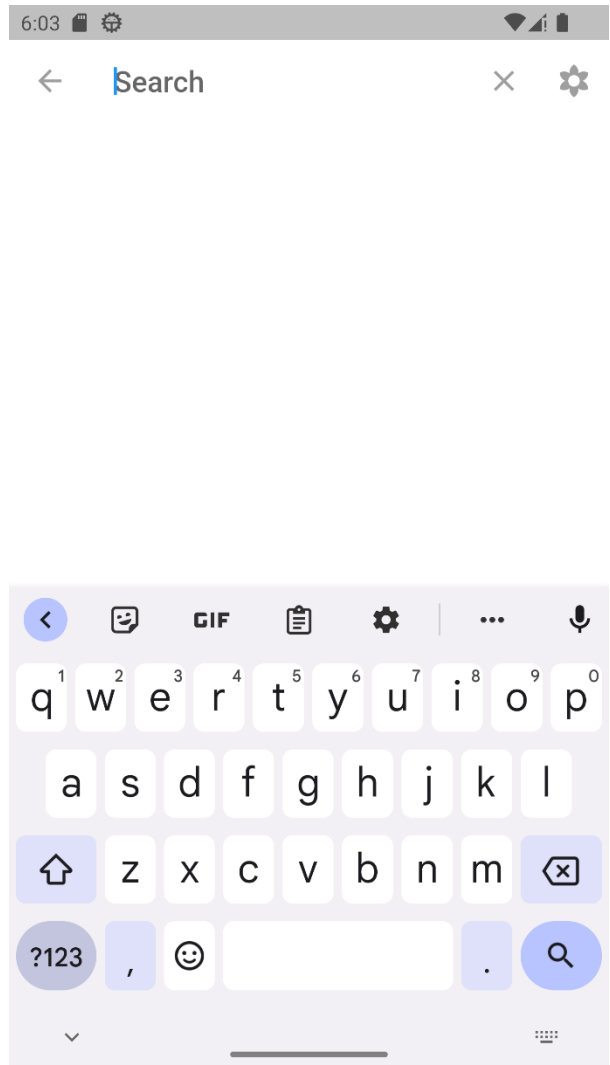


Figure 4.2.6.4: Search screen

4.2.7 Notifications Screen

The notifications screen displays the received notifications, for both photographer and client.

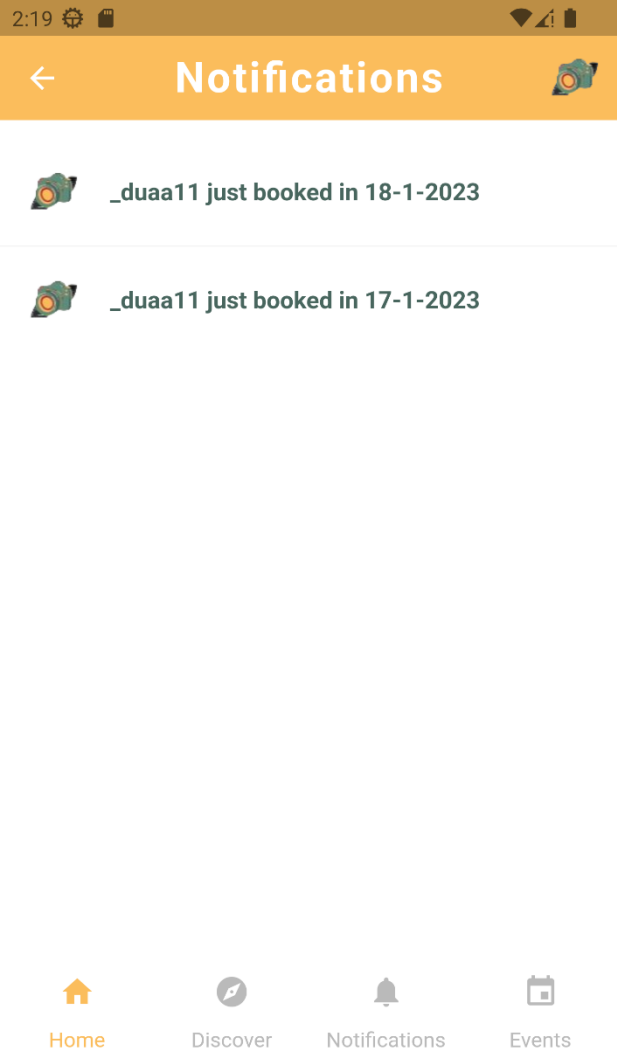


Figure 4.2.7: Notifications Screen

4.2.8 Events Screen

The Events screen displays all the upcoming events (not only from the following list) with details and information about the photographer, location, date, time, and description.

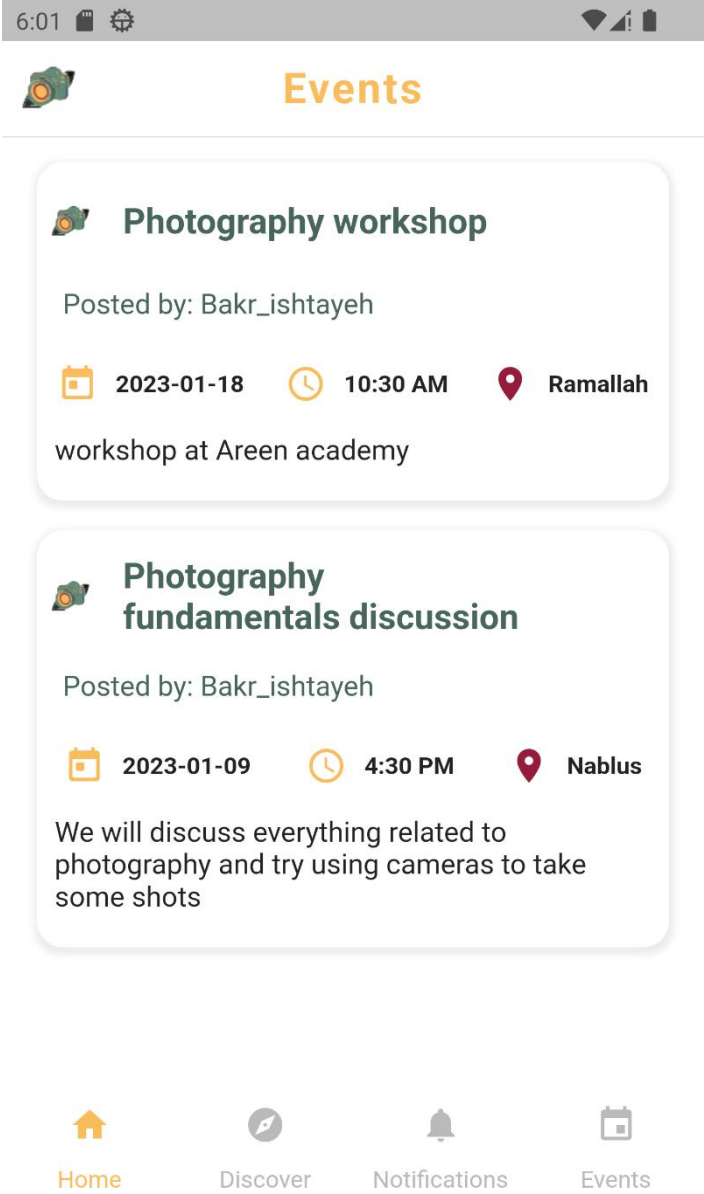


Figure 4.2.8: All Events Screen

4.2.9 Profile Screen

Profile Screen

1. Photographer Profile

Displays the posts that the photographer posted in Photogenic. When the user clicks on any photo, the post will be displayed.

In addition to that, the photographer can edit his profile by clicking on the (Edit Profile) button, then add his information and save it.

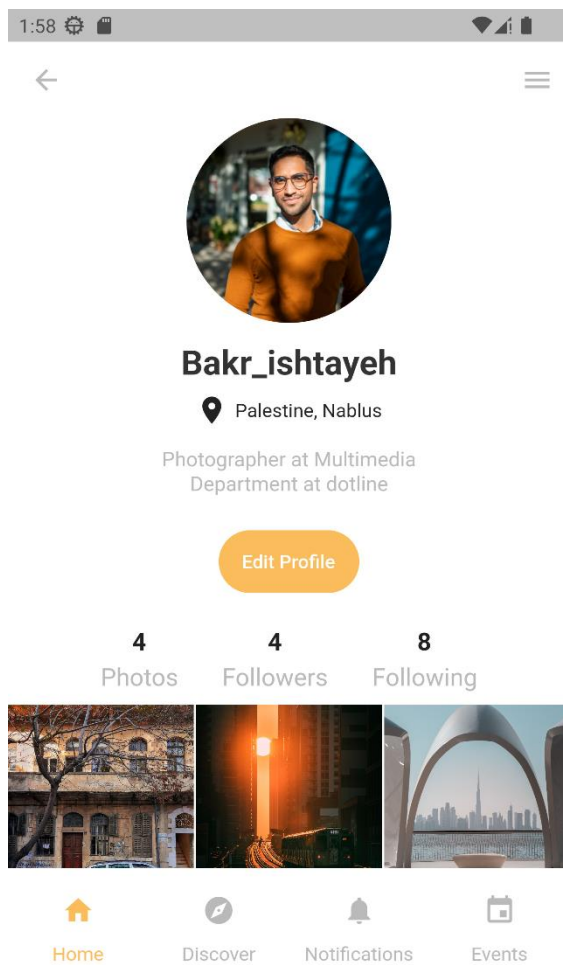


Figure 4.2.9.1: Photographer's Profile

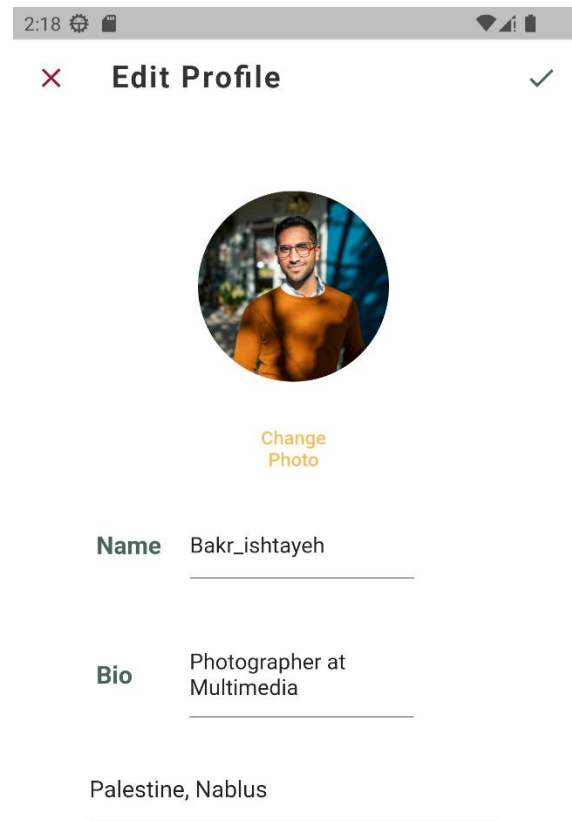


Figure 4.2.9.2: Edit profile

The drawer in the photographer's profile has three features:

- ⇒ **Calendar:** On this screen, the photographer can add his available scheduled times, and the client can book an appointment. Then, this time will not be available for other clients.
- ⇒ **Events:** This screen has two tabs, upcoming events to display future events for the photographer and previous events to display the past events with some photos.
- ⇒ **Map:** This screen shows a fixed location of the photographer. He can change his location by clicking the first button to read his position or adding location details in the text field.

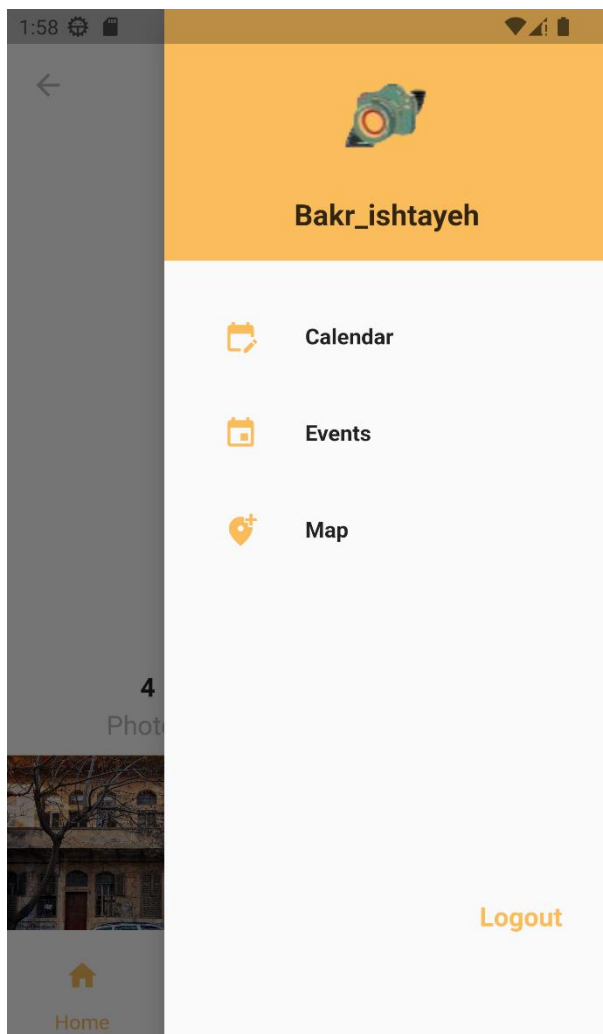


Figure 4.2.9.3: Drawer

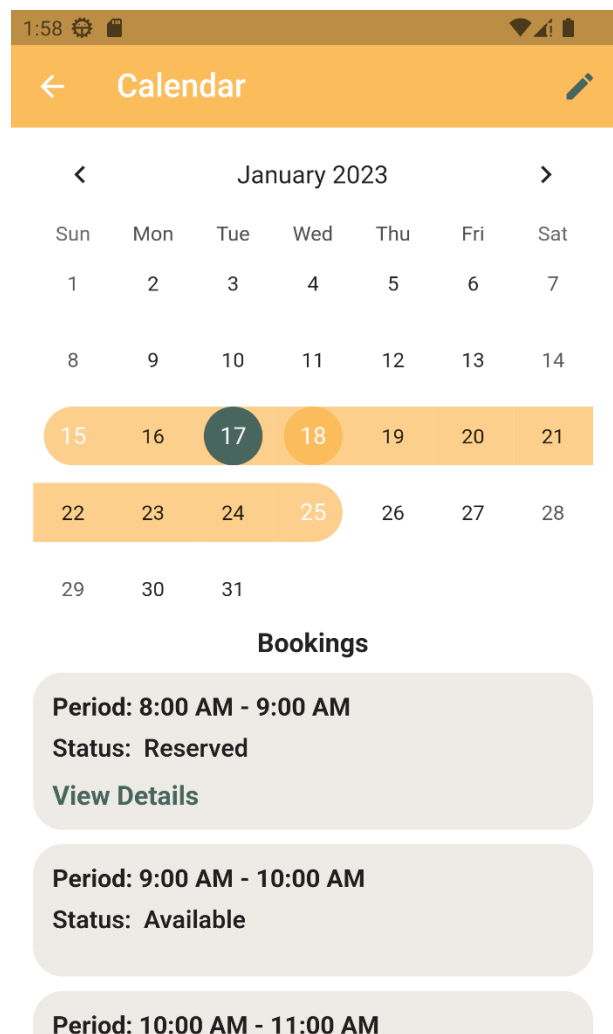


Figure 4.2.9.4: Photographer's Calendar

- **Calendar**

The photographer can edit his calendar by adding details about the bookings and a schedule of his available times for a period of days and hours. After that, the client can choose the most suitable time and book a photo session with the photographer.

1:58

← Edit Your Calendar ✓

Start Date 2023-1-15

End Date 2023-1-25

Available days and hours

Sunday from 12:00 PM to 4:00 PM

Monday from 8:00 AM to 5:00 PM

Tuesday from 8:00 AM to 5:00 PM

Photoshoot Duration 1.0 Hrs

Photoshoots Pricing + Add

100 Edited photos - \$80

Figure 4.2.9.5: Edit Calendar

When the client wants to book a photo session with the photographer, he can select a suitable time, add his name, email, and phone number, then click on (submit) to submit and save the booking. Also, the client can cancel the booking.

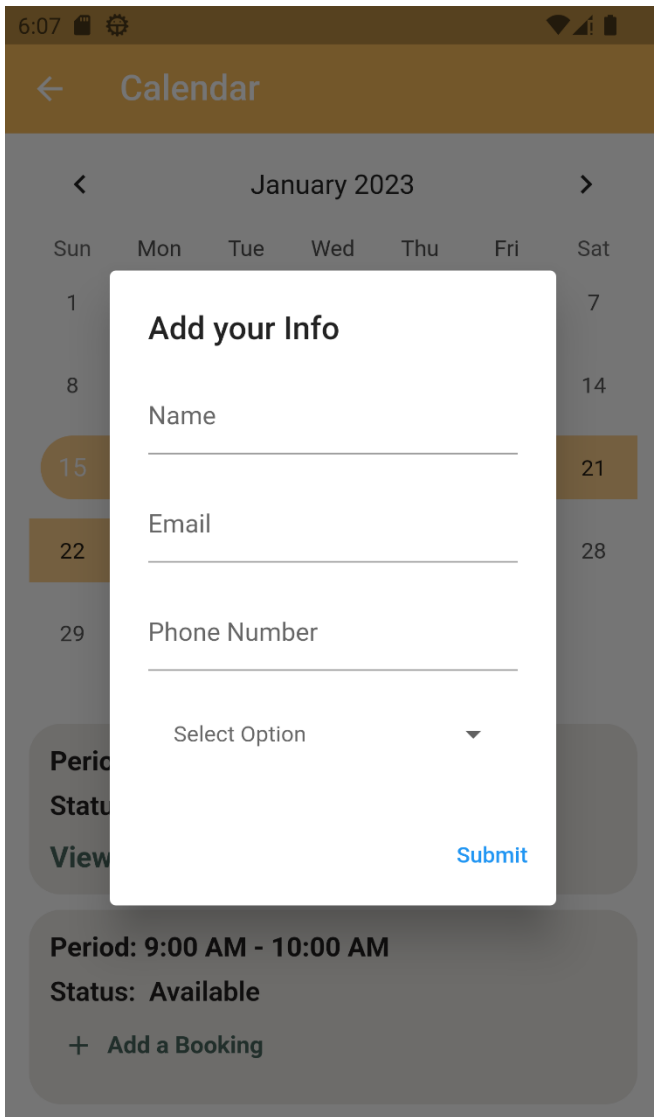


Figure 4.2.9.6: Client's Booking info

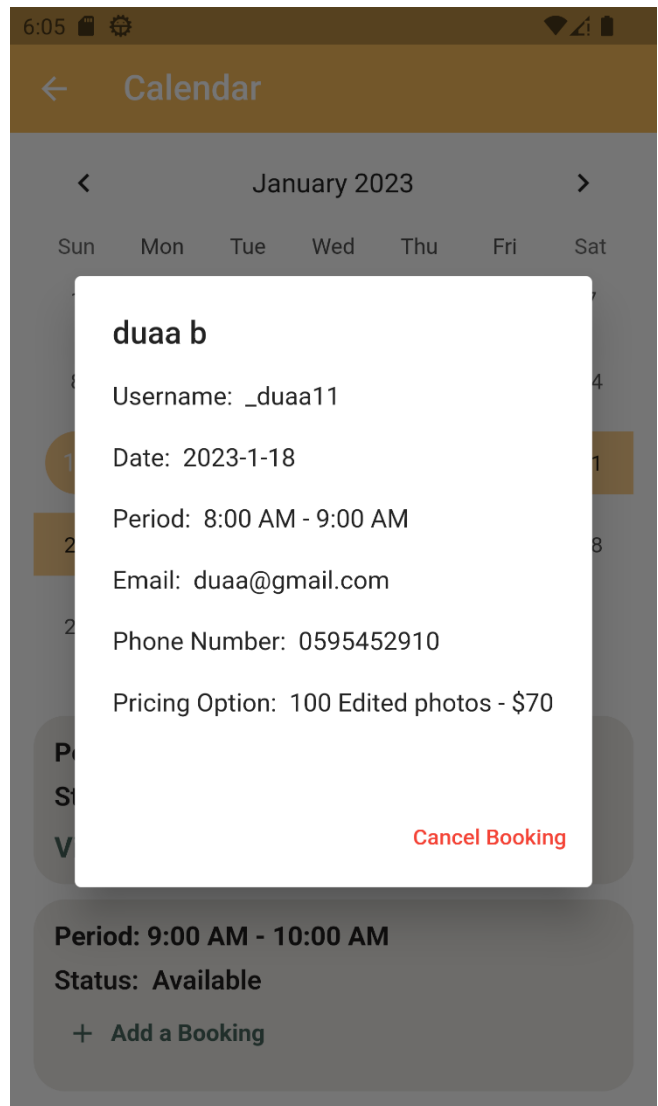


Figure 4.2.9.7: Booking's details

- **Events**

This page has two tabs, the first one about the upcoming events for the photographer and the second one for the previous events of the photographer with some photos of the events.

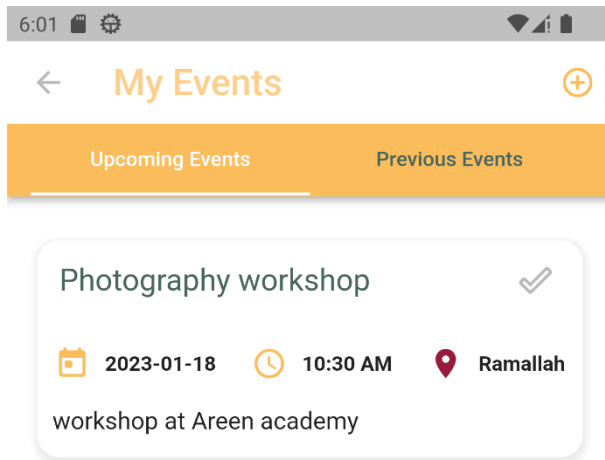


Figure 4.2.9.8: Upcoming Events

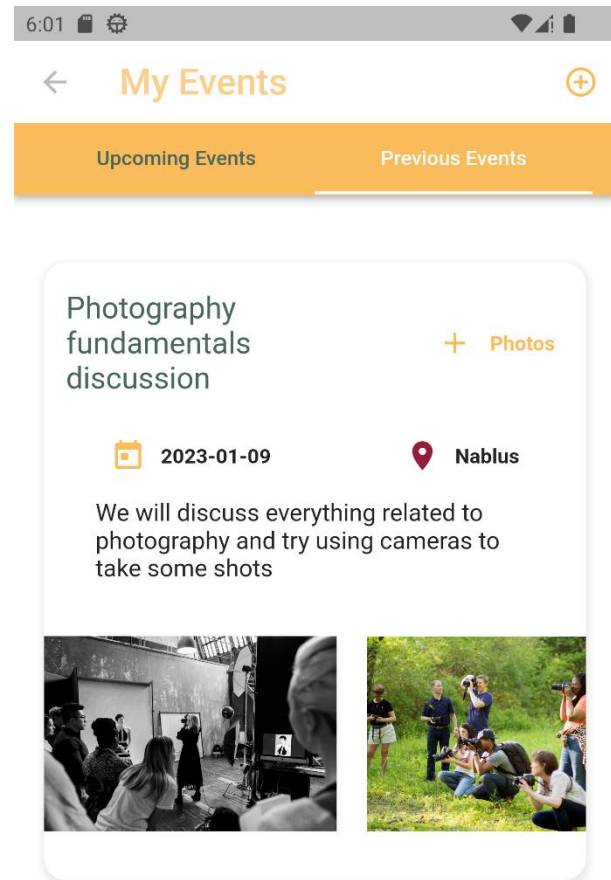


Figure 4.2.9.9: Previous Events

- **Map**

On this page, the photographer can add his location by clicking on the first button or writing the location details in the text field and then saving it by clicking on the second button.

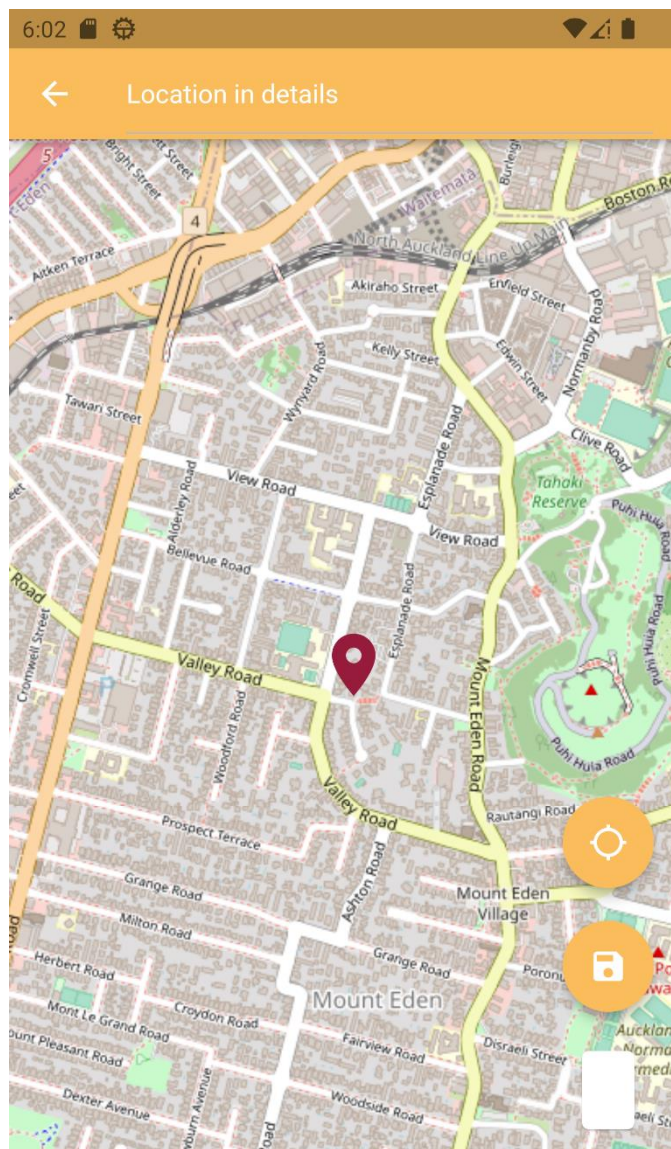


Figure 4.2.9.10: Map

2. Client Profile

Displays the posts liked by the client and bookings in two different tabs.

The first tab shows the posts liked by the client. When the user clicks on any photo, the full post is displayed.

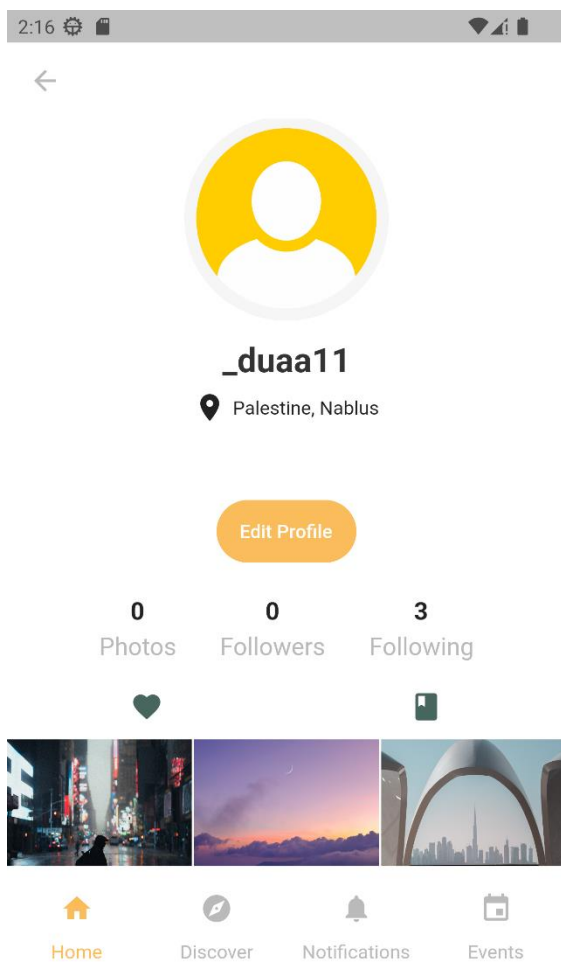


Figure 4.2.9.11: Client's Profile

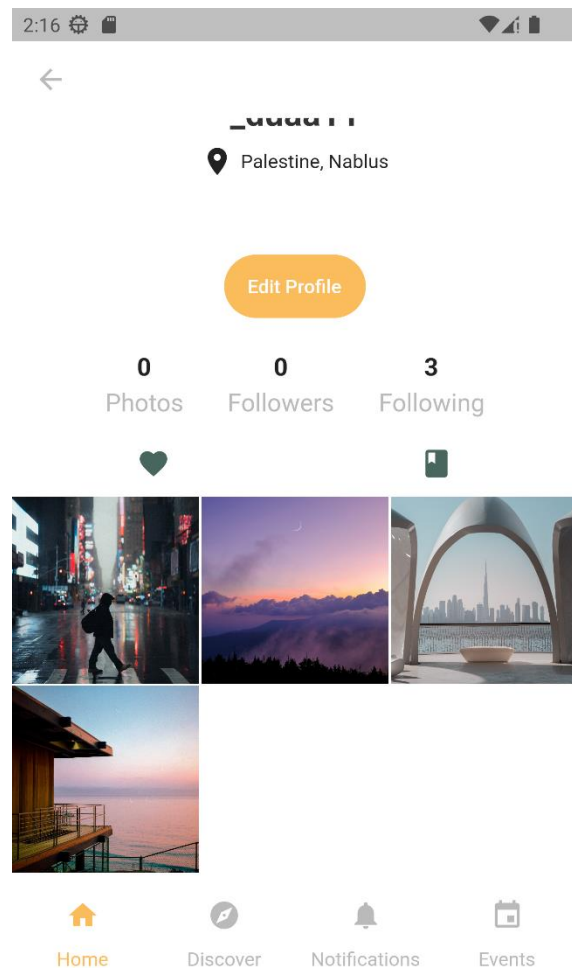


Figure 4.2.9.12: Client's Likes

The second tab shows the booked appointments by the client, with the photographer's name, time, and date of the photo session.

In addition to that, the client can edit his profile by clicking on the (Edit Profile) button, then add his information and save it.

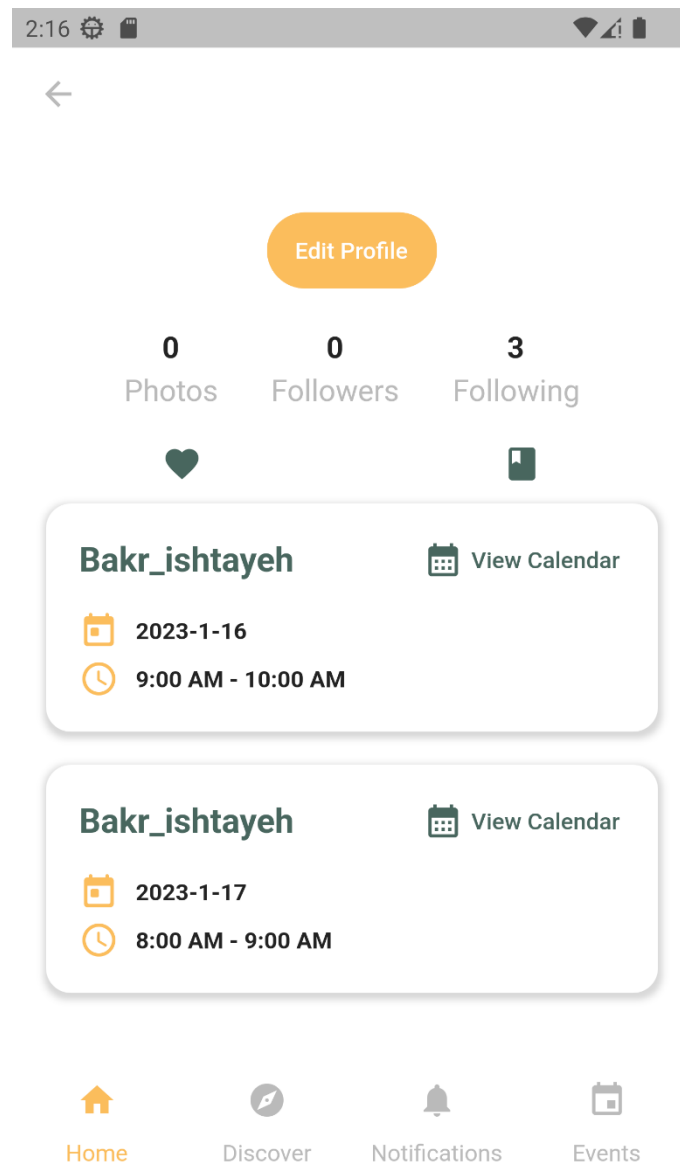


Figure 4.2.9.13: Client's bookings

4.2.10 Single Post Screen

The single post screen appears when the user clicks on any photo of the posts. It shows the picture, photographer's name, description, and the number of loves.

Both photographer and client can react to love on the post.

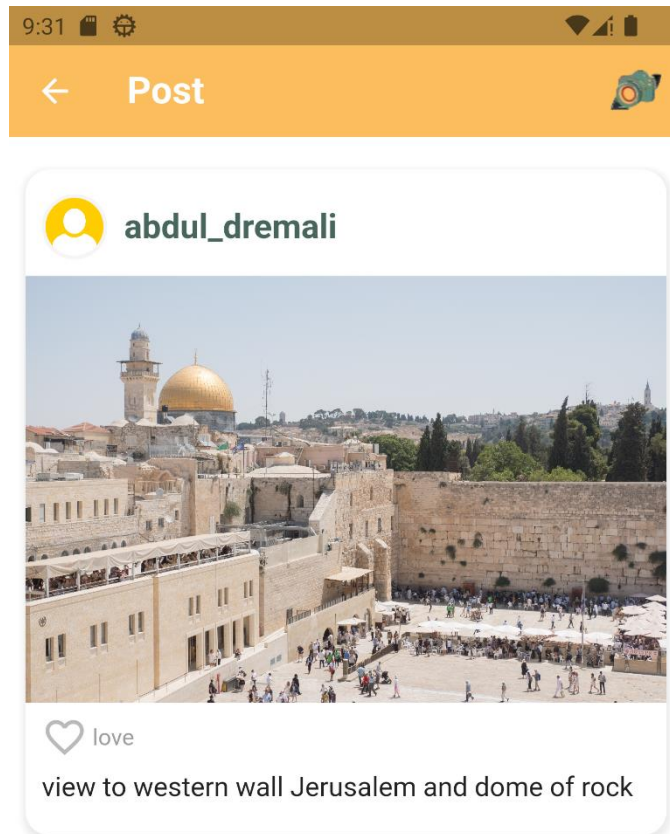


Figure 4.2.10: Single Post Screen

4.3 Mobile Application and Website Structures

4.3.1 Front-end

1. **Dart:** An object-oriented programming (OOP) language, used to build web, mobile, desktop applications.
2. **Flutter:** Cross-platform mobile application development framework, which means that it can be used to develop apps for multiple platforms such as Android, iOS, Linux, Mac, Windows and the web.
3. **Google Maps API**

4.3.2 Back-end

1. **Node js:** Express js package
2. **Python:** Used for the recommendation system.
3. **Flask:** Used to connect the backend with the recommendation system.

4.3.3 Database

1. **Relational Database:** MySQL
2. **Non-Relational Database:** Firebase

4.4 Notifications

Firebase cloud messaging is used to implement the notification feature.

There are two types of notifications included in the application, listed as follows:

- 1) When a new booking is added to the photographer's calendar, a notification is sent to him/her.
- 2) If one customer wants to book a photo shoot in a reserved hour, he/she can set a reminder to be notified when it becomes available.

4.5 Recommendation System

Photogenic includes two features that use the recommendation system, which are:

1. Recommended photographer: the system recommends the user new photographers to follow based on the type of photographers the user follows.
2. Recommended posts: the system recommends posts from different photographers that the user might find interesting.

It is built mainly with the content-based filtering principle, which means that it focuses on the user interactions with photographers using likes and follows, and creates some recommendations, and for this purpose, it calculates the cosine similarity between the posts the user likes and all other posts based on their category and keywords used to describe them, and recommends the posts with the highest scores, and the same is done for photographers' recommendations, but they are recommended based on their category and location. cosine similarity is used to find how much two items are similar, especially when the attributes have textual data, and have the following equation:

Cosine similarity is used to find how much 2 items are similar, especially when the attributes has textual data, and has the following equation:

$$\text{cosine similarity} = S_C(A, B) := \cos(\theta) = \frac{\mathbf{A} \cdot \mathbf{B}}{\|\mathbf{A}\| \|\mathbf{B}\|} = \frac{\sum_{i=1}^n A_i B_i}{\sqrt{\sum_{i=1}^n A_i^2} \sqrt{\sum_{i=1}^n B_i^2}},$$

Figure 4.5: Cosine Similarity Equation

where A_i and B_i are components of vectors A and B respectively.

Its result ranges from 0 to 1 for textual data, as 1 indicates matching and 0 indicates lack of similarity or matching between two items.

4.6 Users Authentication

On signup, users provide their email, and it will be used next for email authentication, which means that the application wants to verify that the user is who he/she claims they are, and for this purpose, Firebase authentication is used to register users and then send them a verification link to their provided email.

Fifth Chapter

5. Results and Discussion

Photogenic is a unique mobile application that:

- Gather all the photographers in one platform.
- Facilitates communication between the customer and the photographer.
- Avoids conflicts and delays in booking photo sessions because it makes the process user-friendly.
- Enables the photographer to announce their upcoming events.
- Customers can search for the most appropriate photographer according to his location and type of photography.

Photographers' profile is like their portfolio because it contains a description (bio) of them, their type of photography, and their upcoming and previous events.

Sixth Chapter

6. Conclusion

6.1 Summary

Photogenic is a platform that enables photographers to reach their targeted audience because it is only for photographers and their customers.

It allows us to use the basic concepts we gain from java (OOP), database, and critical thinking courses. Furthermore, learning new skills to outcome with this final project.

⇒ Flutter and flutter widgets and packages.

⇒ Firebase

⇒ Node js

⇒ Google Maps API

6.2 Future Work

Because photographers spend their time and money on improving their skills and shots they take, there should be some way to protect their identity and effort against plagiarism, so there could be an optional license the user can use to their photos to make the application more trustful and encourage other photographers to upload their photos. A rating system can be added to allow customers rate their experience with the photographers they deal with, which will enhance the user's experience.

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