Technical Project Report - Android Module

TripFinder

Subject:	Computação Móvel
Date:	Aveiro, 25-01-2022
Students:	84924: Miguel Costa 89180: Rodrigo Santos
Project abstract:	This project consists of an application of trips. The users here can select the pretended trips they want to do, take photos of those places to be anonymously shown in a public gallery and check their own traveling statistics.

Report contents:

1 Application concept

Nowadays it's possible to visit any city and be taken to meet it's points of interest by paying for a tour guide, or using the internet to find those same points and using applications such as google maps in order to go to those places. However, we felt that something easier and cheaper was needed to provide to those people, without requiring them to fulfill some schedules or other setbacks that can appear. So our objective was creating an app, which we called TripFinder, that allows its users, in a more practical way, to find a fast and free way to meet those touristic points and the best routing to them in a new city of choice, and the simply enjoy the time while doing so, without restricted schedules or depending on others.

2 Implemented solution

Architecture overview

Our application was developed in Android in Java, utilizing Firebase Storage to store trip photographs, Firebase Authentication for user authentication and account creation and Android Room Database for the storage of information about trips and users.

Thus, obtaining the following architecture:

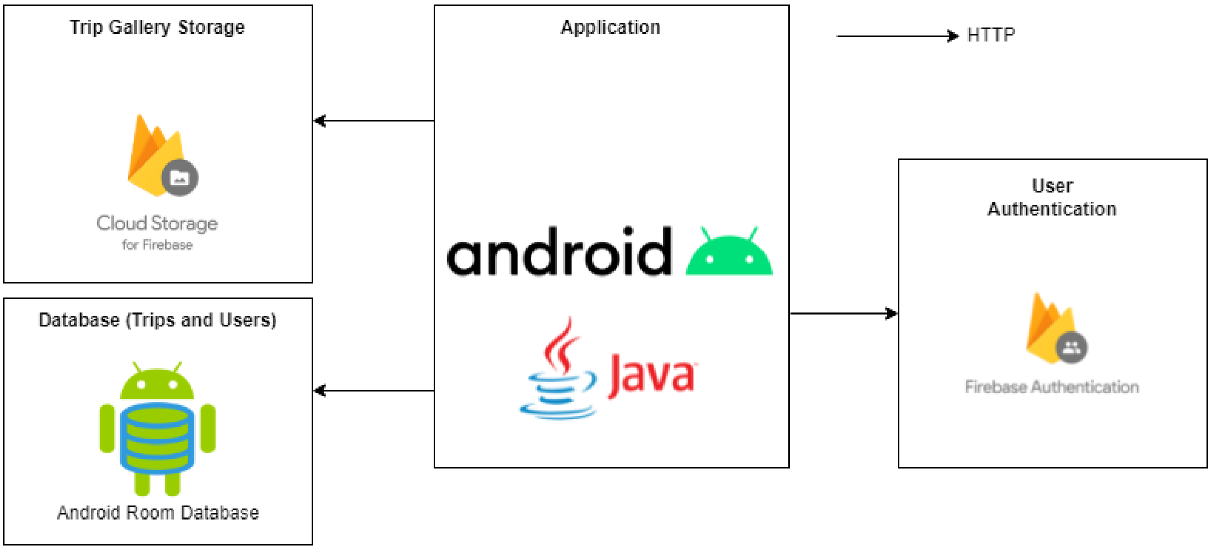


Fig. 1 Project architecture

In our app we used several modules, as stated Firebase Authentication and Cloud Storage were used, the first to manage user authentication and account creation, and the last one for storing and retrieving the user taken pictures for each trip, these pictures are displayed in the trip gallery of the application anonymously.

For storing trip information such as the trip id, trip name, trip route, trip short description, trip image URL, trip distance and trip long description, it was used Android Room Database, as well as for storing user related information such as the user's name, and profile image. Resulting on the creation of two separate databases for the project.

The trip's images used are not stored locally, they are imported from the internet using the URL stored to save space on the database.

Our application utilizes the Google Maps, and Google Location APIs for the implementation for user localization, as well as for the routes. For the routes a guide was found which we followed what it did and used directly, without major changes.

On the application the list of nearby trips and the gallery of images of each trip are implemented using Recycler Viewers, each with its own adapter. All the other application components are simple widgets. In order to load the trip gallery images faster we used the Glide library.

Implemented interactions

Initially we have the login page (Figure 2). In that page we can login into the app using the already registered account's credentials or choose to go to the registration page (Figure 3).

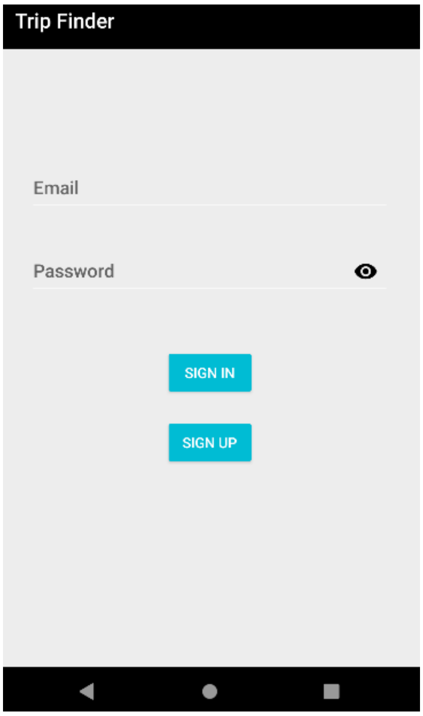


Fig. 2 Login Page

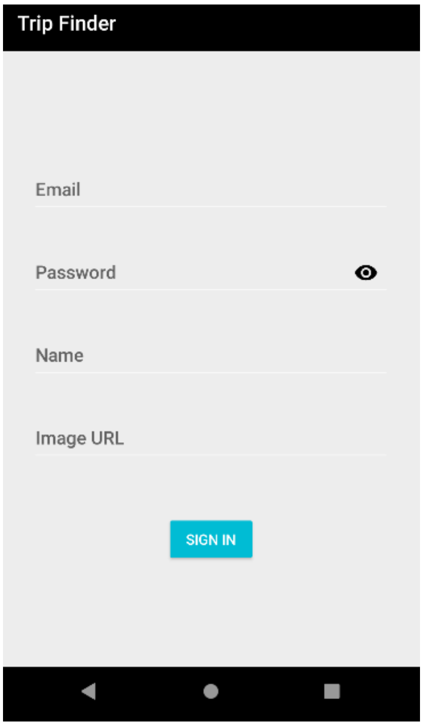
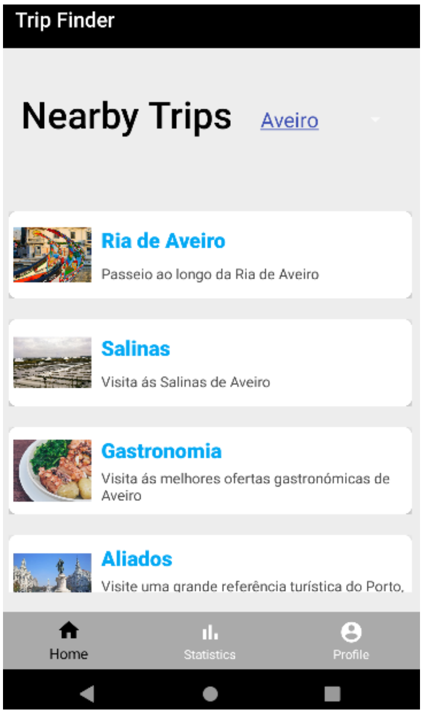


Fig. 3 Registration Page

After that we have the Trip list page (Figure 4) where we can see a list of trips and choose one of them to travel. When selecting a trip it opens another page (Figure 5) with more detailed information about that specific trip and the user has 2 options, the first one is starting the actual trip which leads to the map page (Figure 6) which shows the user's current position and it's destination and also the best route between both.



Trip Finder

Nearby Trips Aveiro

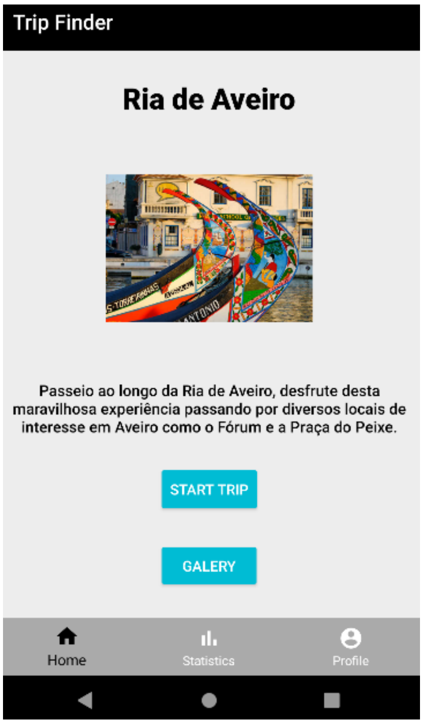
Ria de Aveiro
Passeio ao longo da Ria de Aveiro

Salinas
Visita ás Salinas de Aveiro

Gastronomia
Visita ás melhores ofertas gastronómicas de Aveiro

Aliados
Visite uma grande referência turística do Porto,

Fig 4. Trip List Page



Trip Finder

Ria de Aveiro

Passeio ao longo da Ria de Aveiro, desfrute desta maravilhosa experiência passando por diversos locais de interesse em Aveiro como o Fórum e a Praça do Peixe.

Fig 5. Trip Info Page

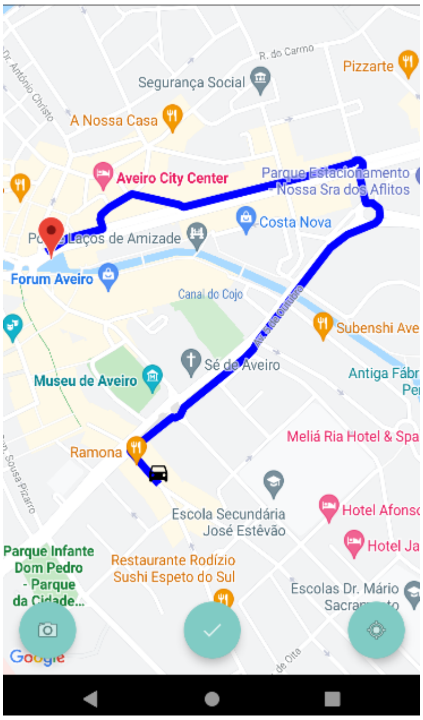


Fig. 6 Map Page

In the map page we have 3 buttons, the left one goes into the camera so the user can take photos of the places he is currently visiting, the one in the right can activate the tracking for the user's current position while he's traveling and the middle one completes the Trip for the user and it goes back to the trip list page.

The other option for the trips is the trip gallery page (Figure 7) where the user can verify every photo taken anonymously by the users who were on that specific trip.

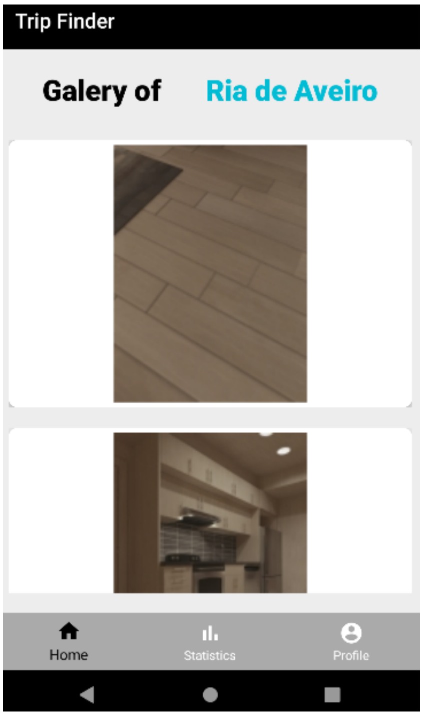
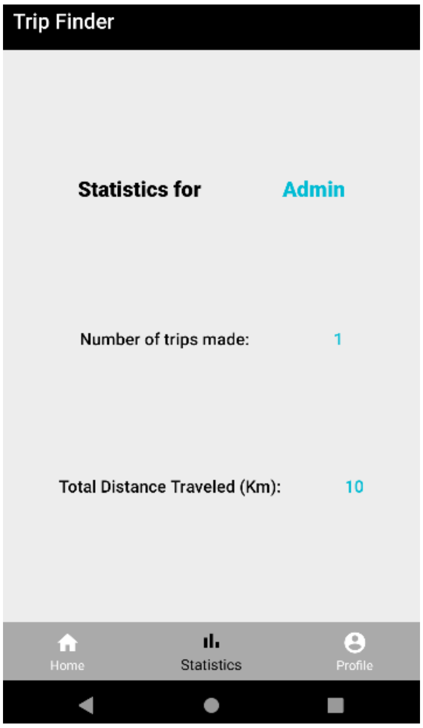


Fig. 7 Gallery page

Then we have the statistics page (Figure 8) where the user can verify it's own statistics about the trips he has already completed and distance made. Finally we got the Profile page (Figure 9), where the user can see it's own information, has 3 buttons, the logout button which obviously logs the user out of the app, a preferences button which is supposed to go to a page for the user to change some credentials and the button for the user to check the trips he completed. This last one should be similar to the main page, except that with only the trips completed, but it's not completed.



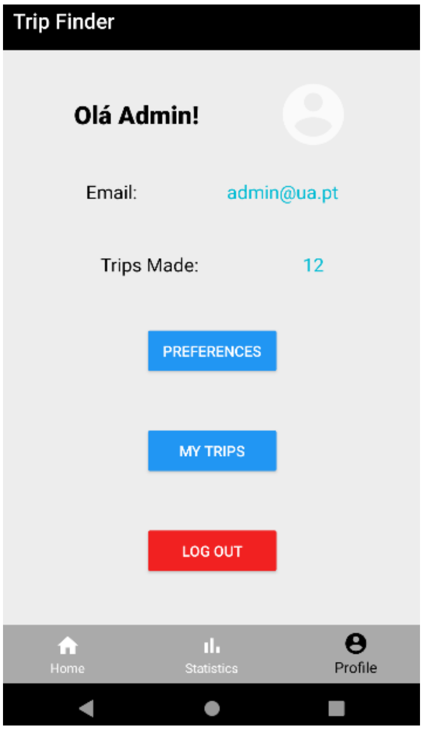
Trip Finder

Statistics for Admin

Number of trips made: 1

Total Distance Traveled (Km): 10

Fig. 8 Statistic Page



Trip Finder

Olá Admin!

Email: admin@ua.pt

Trips Made: 12

Fig. 9 Profile Page

Project Limitations

It’s missing cloud storage, where we can store data about every user and the trips to further progression in the app, providing online/local synchronization. In this case, the users created in one phone, their info isn’t available in other phones when logging in their accounts. User’s can’t create new trips to be available to other users.

3 Conclusions and supporting resources

Lessons learned

There weren’t major difficulties when developing the app as it is. We could say that there were some difficulties when developing some functionalities on our map and also some details regarding the user’s details. We also found some difficulties when trying to display images in our photo gallery that exists in our app, as we were trying to download the images from firebase using the DownloadURL, but this took some time so the images wouldn’t be displayed correctly, until we decided to use the Glide Library, which made all the work much easier and faster.

The implementation of Room persistence was surprisingly simple to use, although some technicalities made some parts of it a bit difficult. The use of google maps was also interesting to use and when making the details work was also fun.

Project resources

Resource:	Available from:
Code repository:	RodrigoSantosgit/TripFinder_AndroidModule (github.com)
Ready-to-deploy APK:	trip_finder.apk

Reference materials

Fazer upload de arquivos com o Cloud Storage no Android | Firebase Documentation (google.com)

Fazer o download de arquivos com o Cloud Storage no Android | Firebase Documentation (google.com)

Autenticar com o Firebase usando contas baseadas em senhas no Android | Firebase Documentation (google.com)

Visão Geral do SDK do Maps para Android | Plataforma Google Maps

Draw route between two locations in Android - Google Maps Directions API