CS102	Fall 2020/21		
Instructor:	Uğur Güdükbay	Project Group	E
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Criteria	TA/Grader	Instructor
Presentation		
Overall		

~ BilGit ~

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Detailed Design Report

(2nd Draft)

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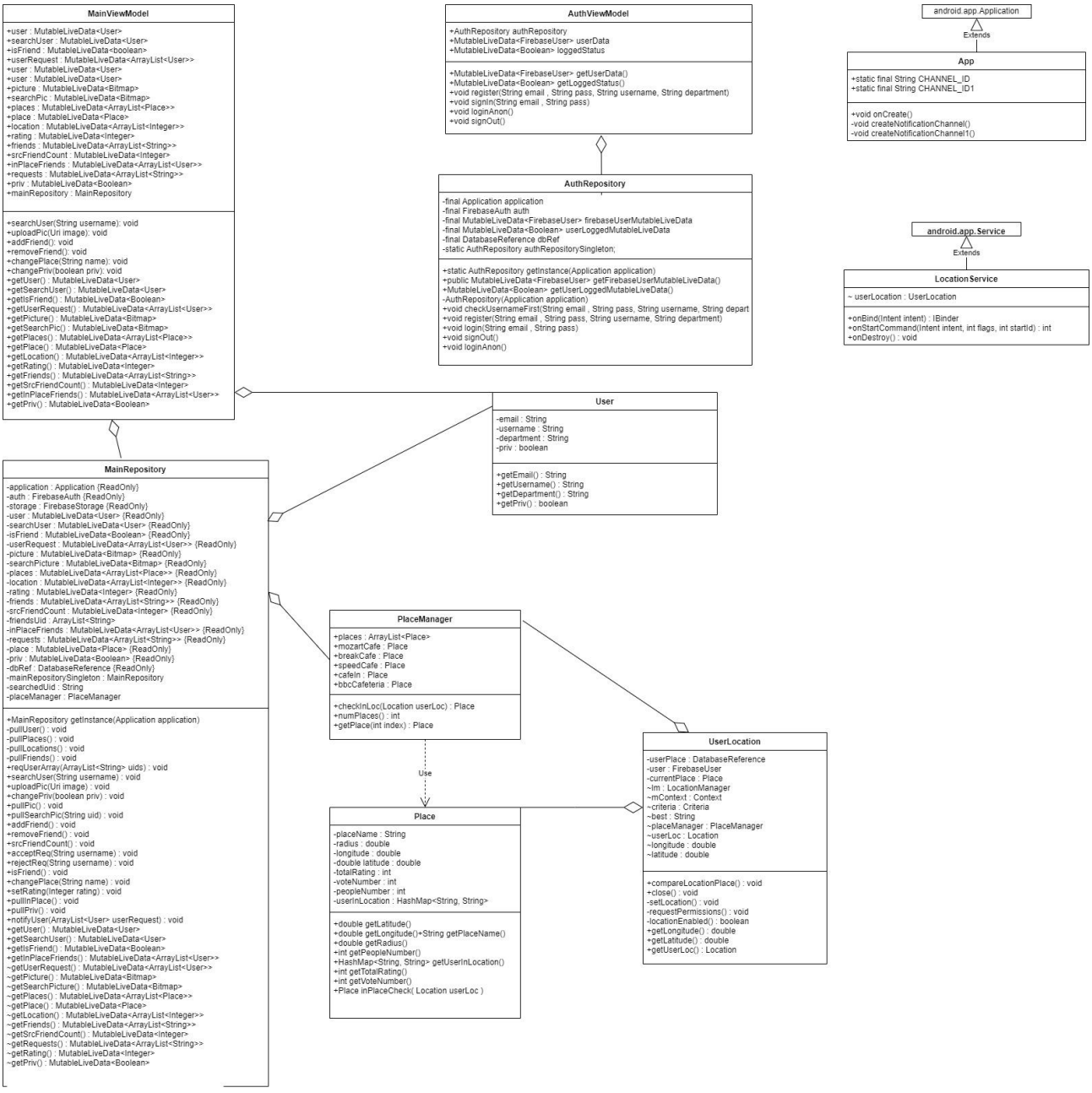
1. Introduction

BilGit is a location aware android app that tracks and displays the crowdedness of various cafes and restaurants in the Bilkent University campus using location data of its users. The app aims to let students make an informed decision about where they want to hang out based on how crowded the places on the campus are.

2. System Overview

The application was developed using Android Studio. We used a variety of Android's APIs and libraries to achieve various tasks such as, asking permissions for location services, getting user location, authorizing login, sending notifications etc. We used Google Firebase database system to store user location and place location/population data to check if a user is in a place and get the relevant data about place population. The user login and authorization system is also controlled by Google Firebase's authorization system. The UI is also done inside android studio, using XML code.

3. Core Design Details



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4. Task Assignment

Ahmet Emir Boşnak: Working with Android location services APIs to get location information. Implementation of the friend system. UI work for profile and friend profile pages.

Atika Zeynep Evmez: UI design of home page and place fragments and basic android architecture implementation, some implementations related to Firebase database system and Android widgets.

Ozan Can Gülbaz: Implementing Firebase database systems, background services, local location logic and retrieving and sending data.

Arda İynem: User authorization with Firebase, Firebase and android integration, basic UI design, android and MVVM architecture implementation.

Zeynep Naz Sevim: Design of Place class, also working on implementation of location services, implementation of the setting tab, friend request notification.

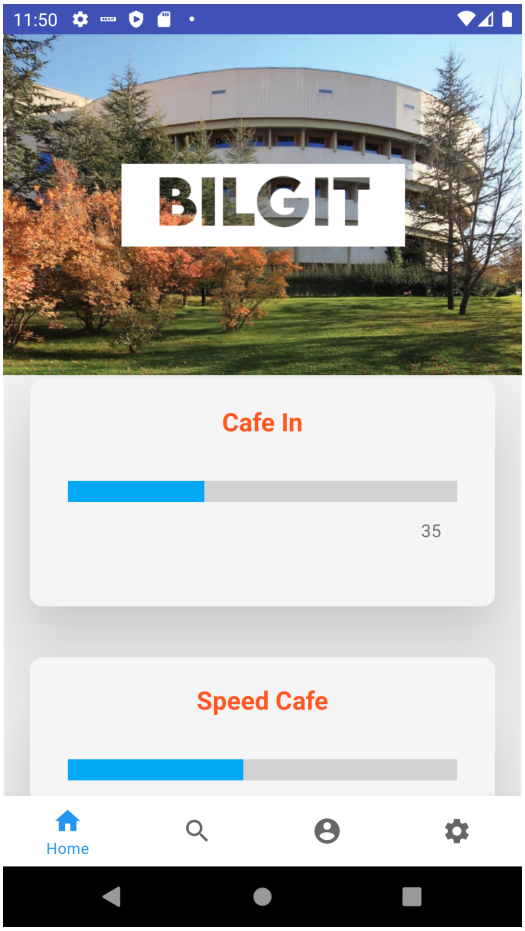
5. What We Achieved/What We Couldn't Achieve

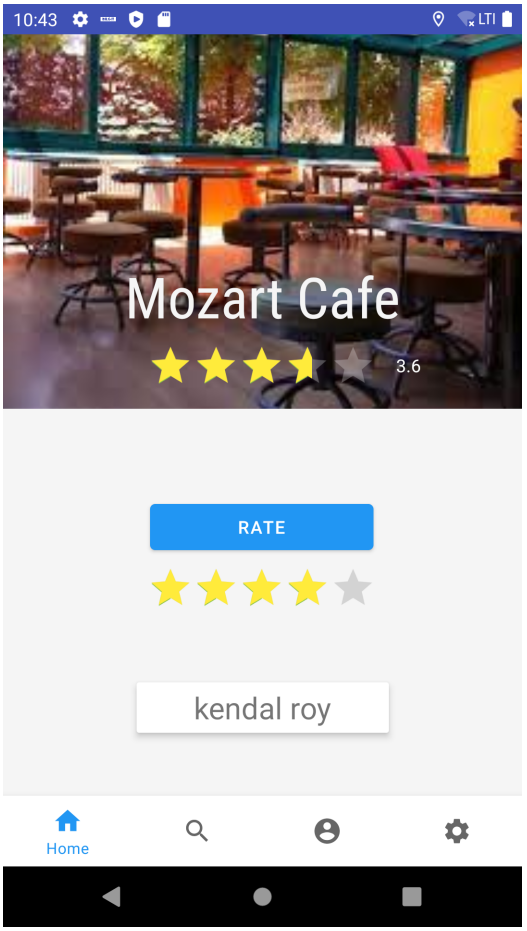
Firstly, we successfully managed to make all the core features work as we intended. The location services work as expected, and the integration with the database is smooth. The software can successfully track how many users are present at a specific place and update the number if some users exit a place. The location system and the friend system are successfully integrated together to let users see if their friends are in a specific location. The integration of public/private profiles is also successfully completed, hiding where a user is from other users if a user chooses to make their profile private. With achieving these core features, we are satisfied with our project since the core concept works as intended and the functionality is as close to what we imagined.

On top of these core features, we also successfully completed a basic search feature to search for other profiles, a rating system to let users rate places and see the average rate, a profile and friend system with adding/removing friend functionality, and a notification system for notifying the user about the usage location services and receiving notifications about friend requests. Finally, there is a fully functional registering and login system that works with Firebase authentication and some other functions for changing email and password.

While we are satisfied with what we have achieved, there were some promised features that we couldn't achieve to implement or decided to not implement at all. Firstly and most importantly, there aren't any features associated with historical population data. Unfortunately, we couldn't focus on tracking population data throughout some predetermined time frame due to time constraints. As a result, all features such as, favourite places for users, graphical representation of crowdedness over a week, colour coding places according to how crowded they are than usual etc., couldn't have been implemented. We also couldn't implement a map view for the application using Google Maps since we couldn't get as reliable information as we desired from Maps API. Apart from these features that couldn't be implemented, we also decided to scrap some other features such as adding other people using QR codes, displaying the distance to places and a separate search feature for searching cafes/restaurants.

6. Some Screenshots and How the App Works





Number of people in each place and a bar indicating how full that place can be seen in the main menu. When clicked on a card for a place, the user can see the overall score for that place, rate the place and also see if any of their friends are there, if they are, their name will show up in the place screen.

Below it can be seen how we keep location information of a user to know if they are inside some place and increase the number of people there accordingly in the database, using unique user IDs.

7. Reflections

The project work was essential and beneficial in how it implicitly taught us how to work on a team-based software project from initial design to final implementation. It showed us different stages of software development and how software comes to be from an initial idea and design to a finished product. The project also made us learn and use Git much more effectively, which will obviously be very useful in the future. Also, since we decided to develop an android app, we learned how to use Android Studio, test an android application with an AVD, and, most importantly, how Android development works. We learned about XML UI design, LiveData and MVVM structure of Android development and how to use Firebase and integrate the real-time database with an Android project. However, these were also the most difficult parts of our project since we had to learn nearly everything from scratch and get used to how things work in Android development. Getting the location services to work correctly was also a challenging part of the project since there were various methods of making location work and a lot of different implementations on the internet. Also, the testing for location services was difficult. The one thing we definitely would do differently is to start the implementation stage much more early. Even though we produced a working software, we could have finished a lot more of our promised features if we had started the implementation stage early. However, despite all the difficulties and scrapped parts, we are incredibly proud of our achievement and incredibly satisfied with our finished product.