Criteria	TA/Grader	Instructor
Presentation		
Overall		

~ BilGit ~

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Detailed Design Report

(1st Draft)
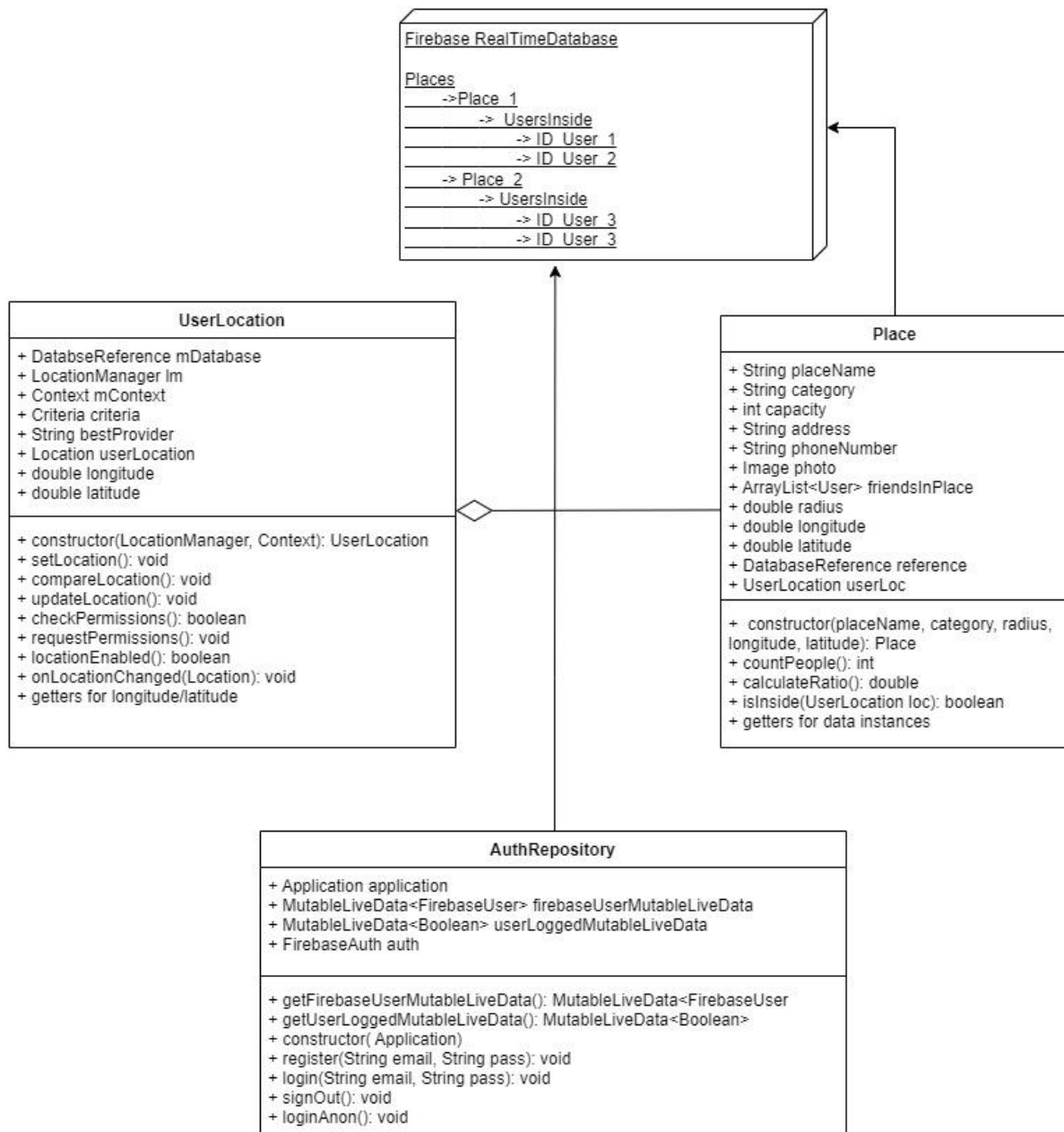
8 December 2021

1.   Introduction

Mobile app tracking the population of cafes in the campus by tracking location of users and showing population.

2.   System Overview

We are using Android Studio to develop the application. We use a variety of Android's APIs and libraries to ask permissions for location services, get user location, authorize login etc.

We also plan to use Google Firebase database system to store user location and place location/population data to then check if a user is in a place and get the relevant data about place population. The UI is also done inside android studio, using XML code.

3. Core Design Details


```
Firebase RealTimeDatabase

Places
        ->Place_1
                -> UsersInside
                        -> ID_User_1
                        -> ID_User_2
        -> Place_2
                -> UsersInside
                        -> ID_User_3
                        -> ID_User_3
```

UserLocation

+ DatabseReference mDatabase
+ LocationManager lm
+ Context mContext
+ Criteria criteria
+ String bestProvider
+ Location userLocation
+ double longitude
+ double latitude

+ constructor(LocationManager, Context): UserLocation
+ setLocation(): void
+ compareLocation(): void
+ updateLocation(): void
+ checkPermissions(): boolean
+ requestPermissions(): void
+ locationEnabled(): boolean
+ onLocationChanged(Location): void
+ getters for longitude/latitude

Place

+ String placeName
+ String category
+ int capacity
+ String address
+ String phoneNumber
+ Image photo
+ ArrayList<User> friendsInPlace
+ double radius
+ double longitude
+ double latitude
+ DatabaseReference reference
+ UserLocation userLoc

+ constructor(placeName, category, radius, longitude, latitude): Place
+ countPeople(): int
+ calculateRatio(): double
+ isInside(UserLocation loc): boolean
+ getters for data instances

AuthRepository

+ Application application
+ MutableLiveData<FirebaseUser> firebaseUserMutableLiveData
+ MutableLiveData<Boolean> userLoggedMutableLiveData
+ FirebaseAuth auth

+ getFirebaseUserMutableLiveData(): MutableLiveData<FirebaseUser
+ getUserLoggedMutableLiveData(): MutableLiveData<Boolean>
+ constructor(Application)
+ register(String email, String pass): void
+ login(String email, String pass): void
+ signOut(): void
+ loginAnon(): void

Basic plan for now is to use Google Firebase realtime database to store ID's of users who are in a specific place. By storing the ID's inside the database table for places, we know how many users are currently in that place, using UserLocation class and Place class together. For login and registering functions we use Firebase authorization database system, which allows us to register, login, and anonymously login users and then storing unique user IDs in the database. These IDs are also what we will use to count the population of the places. Most of the program will use databases to retrieve the necessary data and then inside the Place class methods, we will use the user ID datas to count population and percentage according to capacity.

If we will have time left after implementing these functions, we will expand the app and the classes by displaying some other information about places and users. However, for now we are focused on making the core features work using the mentioned database system.

4. Task Assignment

Arda İynem: User authorization using Firebase and login page UI design

Atika Zeynep Evmez: UI design of home page and place fragments

Ozan Can Gülbaz: Implementing Firebase database systems and making sure they work with UserLocation and Place classes

Ahmet Emir Boşnak: Design of UserLocation class, using Android location libraries to implement location services for the app

Zeynep Naz Sevim: Design of Place class, also working on implementation of location services, UI work for settings tab