PROJECT REPORT ON

"CONTAINMENT ZONE ALERTING APPLICATION"

SUBMITTED BY

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1.INTRODUCTION

An Android application that can inform people about the Covid-19 containment zones and prevent them from entering them. This Android app updates the locations of the areas in a Google map that have been identified as containment zones. The app also alerts users when they enter a containment zone and uploads the user's information to an online database. Many Google tools and APIs, such as Firebase and Geofencing API, are used in this application to achieve all of these functionalities. As a result, this application can be used to raise further social awareness about the need for precautionary measures to be taken by the people.

1.2 PURPOSE

We focus on developing a mobile-based application to provide information about the Covid-19 containment zones in in this paper. The application also tracks the user's location and sends an alert if the user enters a containment zone. The application also provides users with daily Covid-19 case survey data to keep them up to date. The application is built with the Android SDK and stores location data in the Firebase Cloud Firestore. The geofencing client for Android is used to create geofences around containment zones, and the notification manager is used to provide notifications.Users can view the location of the containment zones via the Android application. It also alerts the user when he or she crosses the boundary of a containment zone or remains within it.

2.LITERATURE SURVEY

S.No	TITLE	PURPOSED WORK	APPARATUS/ ALGORITHM	TECHNOLOGY	MERITS & DEMERITS
1	Development of an Android Application for Viewing Covid-19 Containment Zones and Monitoring Violators Who are Trespassing into it using Firebase and Geofencing.	The primary goals of this project are to notify users whenever they enter a containment zone, update the position of the area on a Google map, alert users when they do, and upload the user's IMEI number to an online database..	1. Geofencing API 2. Firebase API 3. Location Tracking 4. IMEI Number 5. Andriod SDK	Cloud Technology	This application can be used as a tool for creating further social awareness about the arising need of precautionary to be taken by the people of India
2	Application for Covid-19 Real Time Counter.	Efficient way of showing the identified Covid-19 containment zone.Futher more lie maritine and forest safety to prevent user from entering restricted areas.	• Time Series Analysis. • Location Tracking	• Cloud Technology	The Application can include various government organization to help act faster.

S.NO	TITLE	PROPOSED WORK	TOOLS USED/ ALGORITHM	TECHNOLOGY	ADVANTAGES/ DISADVANTAGES
3	Aarogya Setu (COVID-19).	In this study, a methodology is given for displaying current Covid statistics..	• Bluetooth • GPS • Digital ID	• Cloud Technology	At a time user can see Covid-19 total cases, active cases and discharge cases.
4	Tracking the Covid Zone through Geo-fencing technique. - JULY 10 2020	In order to track the Covid Zones and improve and tighten security measures, this study will provide a methodology..	• Bluetooth Based Application. • DRDO Netra. • National Intelligence Grid(NATGRID).	• Mobile Network • Cloud Technology	The major issue with those Bluetooth based application is that tracking can be done only if the enabled the Bluetooth option.

S.No	TITLE	PROPOSED WORK	TOOLS USED/ ALGORITHM	TECHNOLOGY	ADVANTAGES/ DISADVANTAGES
5	A Compact Wearable - IOT(W-IOT) system for Health Safety and Protection of Outgoers in the Post-Lockdown World(COVID-19 Lifeguard).	The primary emphasis of this work is an IOT-based health monitoring system that uses a variety of sensors to measure bodily parameters and issues alerts in case of emergencies..	• Spo2 detector. • GPS • Bluetooth Module • GSM Modem	• IOT Technology	The body temperature, heart rate, and oxygen saturation levels have to be monitored regularly.
6	Evaluating how smartphone contact tracing technology can reduce the spread of infectious diseases(COVID-19).	This essay argues that managing epidemics depends on being able to identify and stop the spread of infectious disorders like Covid-19.	• Epidemic Model • Web Scraping • Opportunistic Network(OPP NET) • Web scrapping	• Mobile Computing	Accurate technologies such as Bluetooth allow for greater selectivity when it comes to quarantining people.

2.1 EXISTING PROBLEM

According to the survey, several apps have been developed in the country to battle and contain COVID-19. Most states in our country have their own apps with specific features and functionality to assist their citizens in stopping the spread of COVID-19, obtaining medical assistance during a crisis, raising awareness, and understanding safety precautions.

2.2 REFERENCES

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2.3 PROBLEM STATEMENT

- ❖ Many users have found this app buggy and had reported with login issues.
- ❖ COVID Symptom Tracker App also falls short of being incredibly helpful to scientists and data analysts.
- ❖ This apps seems inadequate to find out symptoms in the patients who were affected by Coronavirus earlier and recovered later.

3.IDEATION & PROPOSED SOLUTION

Ideation is the process where you generate ideas and solutions through sessions such as Sketching, Prototyping, Brainstorming, Brainwriting, Worst Possible Idea, and a wealth of other ideation techniques. Ideation is also the third stage in the Design Thinking process. Proposed Solution means the technical solution to be provided by the Implementation agency in response to the requirements and the objectives of the Project.

3.1 Empathy Map Canvas
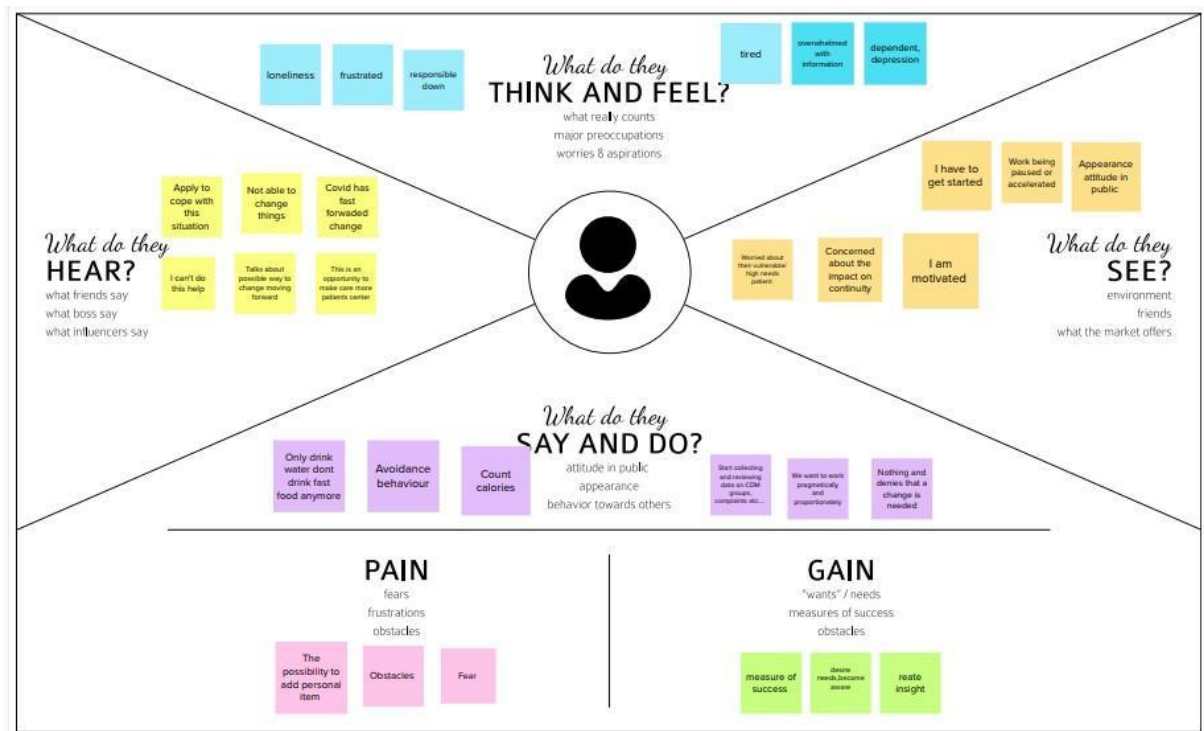
3.2 IDEATION & BRAINSTROMING
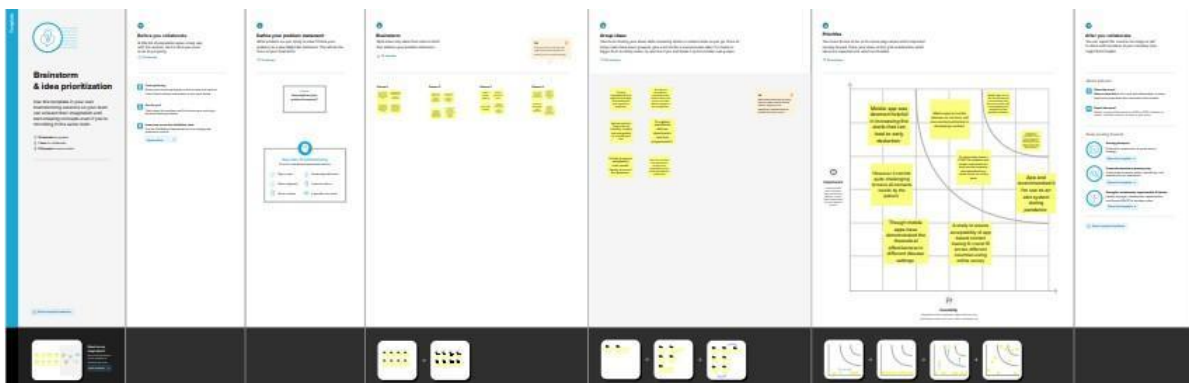
3.3 PROPOSED SOLUTION

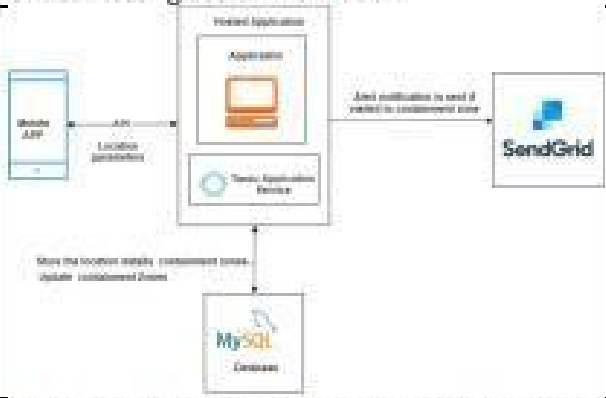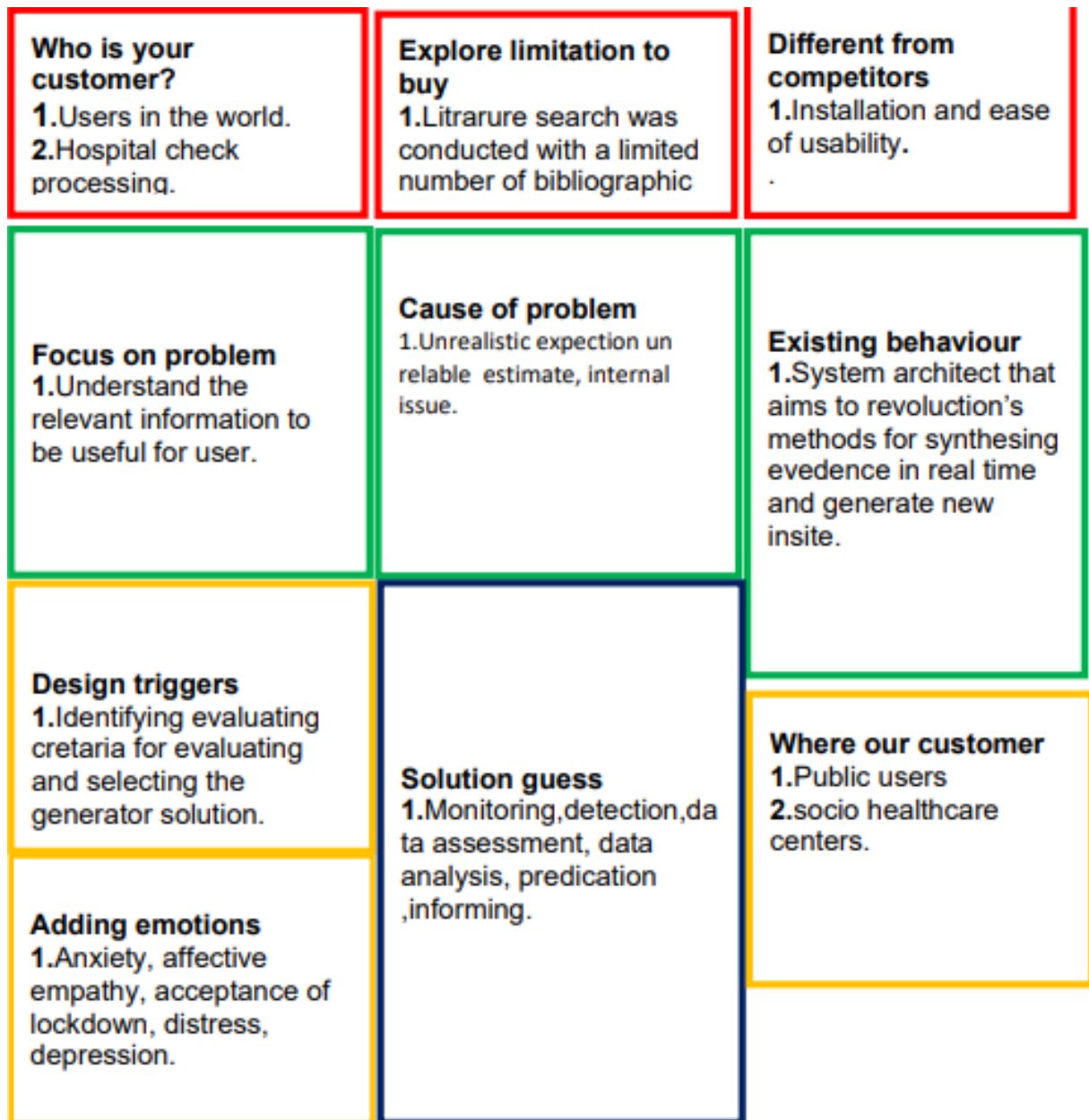| S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Statistics data from RESTful API.Data snapshot from firebase for new data or data snapshot from cache. Containment zones shown on a google map and covid 19 statistics on a bottom sheet. User receives notification on entering a containment zone.
2.	Idea / Solution description	1.Retrieving diagnosis 2.Retrieving Exposure configuration 3.Segmentation 4.Protocal documentation 5.Classification 6.Contributing
3.	Novelty / Uniqueness	1.Android application updates location of areas which are identified to be the containment zone. 2.Application further extract the IMEI number of the trespasser and upload to the online data base. 3.The application prompt background location service permission and if granted the geo fences get trigged even in application is not open in foreground.
4.	Social Impact / Customer Satisfaction	1..Medical Drone deliveries 2. Situational awareness lockdown curfew enforcement. 3.Broadcasting useful information.
5.	Business Model (Revenue Model)	
6.	Scalability of the Solution	The produce the vaccination scenarios and quantity the under reporting impact.Record identification Databases(n=380)Other source(n=10).Duplicate removed before record moved for reasons(n=14).

3.4 PROBLEM SOLUTION FIT

Who is your customer?
1. Users in the world.
2. Hospital check processing.

Explore limitation to buy
1. Litrarure search was conducted with a limited number of bibliographic

Different from competitors
1. Installation and ease of usability.
.

Focus on problem
1. Understand the relevant information to be useful for user.

Cause of problem
1. Unrealistic expection un relable estimate, internal issue.

Existing behaviour
1. System architect that aims to revolution's methods for synthesing evedence in real time and generate new insite.

Design triggers
1. Identifying evaluating cretaria for evaluating and selecting the generator solution.

Adding emotions
1. Anxiety, affective empathy, acceptance of lockdown, distress, depression.

Solution guess
1. Monitoring,detection,data assessment, data analysis, predication ,informing.

Where our customer
1. Public users
2. socio healthcare centers.

4.REQUIREMENT ANALYSIS

4.1 FUCTIONAL REQUIREMENTS

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Users can sign up using their email address or existing phone number.
FR-2	User Confirmation	Confirmation can be completed by sending a verification code via email or using an OTP.
FR-3	Track the location	Utilizing the Google map API, track the intruders and update the areas marked as containment zones on the Google map.
FR-4	Affected areas are shown	Geo fence serves as a warning for trespassers, and containment zones were labeled using zone colours.
FR-5	Alert notification	If the user enters the containment zone, a notification or message will be sent by tracking their location using GPS.

4.2 NON-FUNCTIONAL REQUIREMENTS

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	The COVID-19 investigative process is more effective and thorough because to the user interface, which is particularly easy to use when compared to other interfaces.
NFR-2	Security	The user's data will be secured.
NFR-3	Reliability	The user may travel securely and rely on the information provided by the programme..
NFR-4	Performance	The Geofencing and GPS technologies can be used to produce the most suitable results.
NFR-5	Scalability	It is possible to access this application from anywhere, and the zone information is accurate.

5.PROJECT DESIGN

5.1 DATAFLOW DIAGRAM
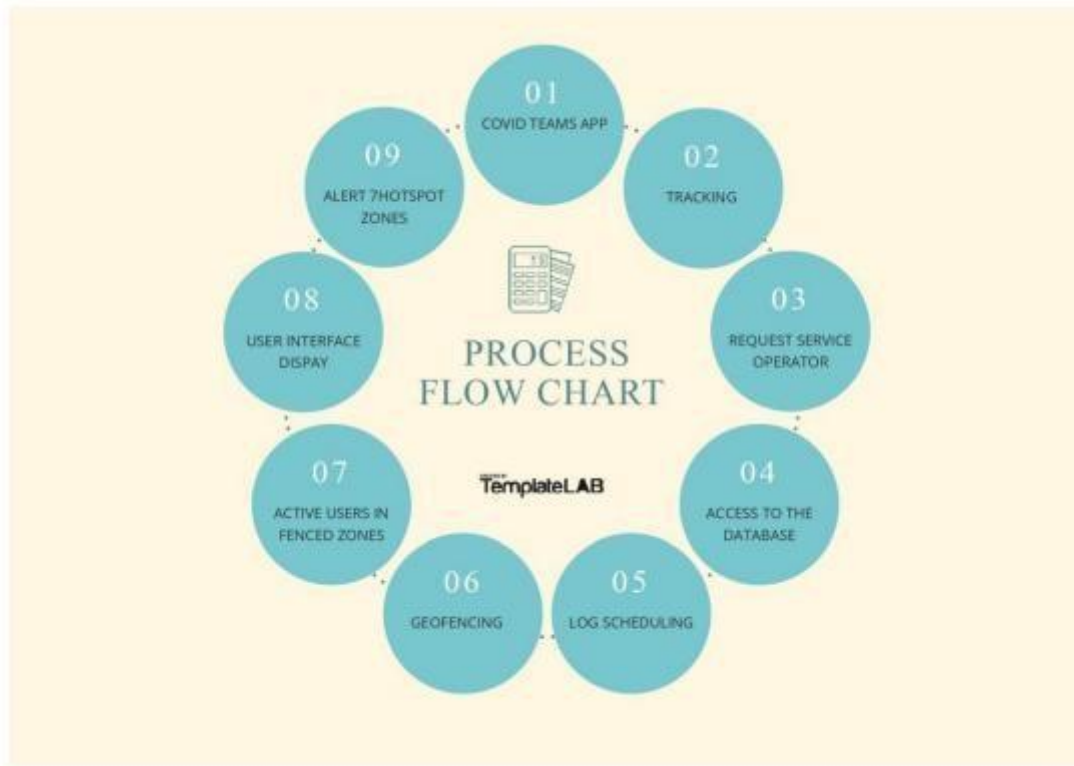
5.2 SOLUTION & TECHNICAL ARCHITECTURE
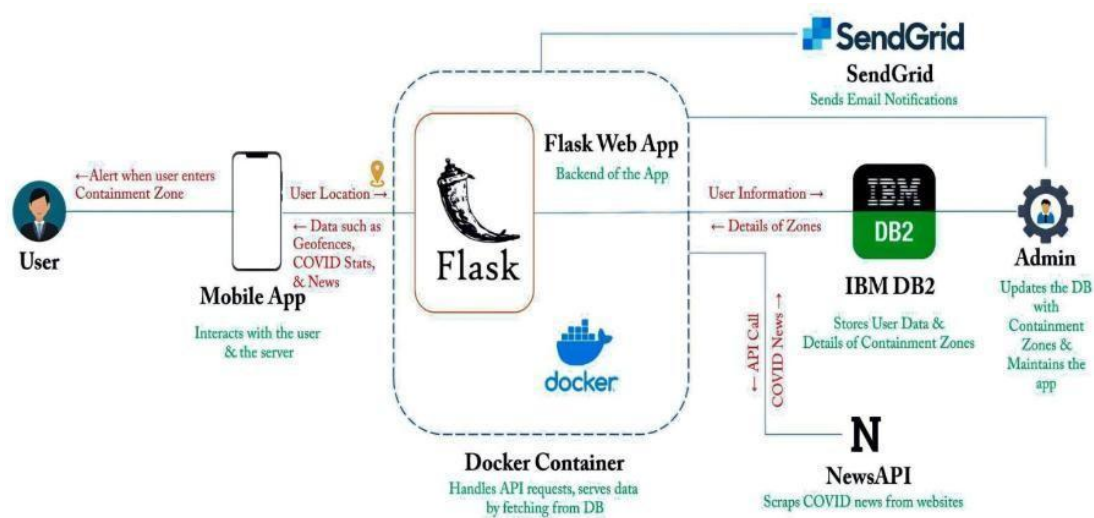
5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (covid team app)	Registration	USN-1	As a user, I can register for the application by entering my email address, password, and password confirmation..	I can access my account/dashboard	High	Sprint-1
		USN-2	As a user, I will receive a confirmation email once I have registered for the application.	I can receive a confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through Facebook.	I can register & access the dashboard with Facebook Login	Low	Sprint-4
		USN-4	As a user, I can register for the application through Gmail.	I can register & access the dashboard with Google Login	Medium	Sprint-1
		USN-5	As a user, I can register for the application through Twitter.	I can register & access the dashboard with Twitter Login	Low	Sprint 4
	Login	USN-6	As a user, I can log into the application by entering my email & password	I can access it whenever I want its access.	High	Sprint-1
	Dashboard	USN-7	As a user, I need to give permission to access My Contacts, Location, and Storage.	I get access to their services	High	Sprint-2
		USN-8	As a user, I get access to the dashboard which shows a map with marked zones	I can see the zone information on the dashboard.	high	Sprint-2

Hospitals Administrator	Registration	USN-9	As a management, I need to register my hospitals on the site.	I can see the registered hospital in the hospital dashboard.	high	Sprint-1
	Login	USN-10	As a management, I need to login into my dashboard with my given hospital id and password.	I can see my dashboard after login.	medium	Sprint-1
	Dashboard	USN-11	As a management, I need to enter the case information of the patient that visits our hospital.	I can view the patient information on the dashboard.	high	Sprint-2
		USN-12	As a management, I need to store all the patient information on the cloud	-	high	Sprint-3
Administrator	Services	USN-13	As an admin, I need to provide valid information about the pandemic out there.	I can get the pandemic updates out there.	high	Sprint-2
		USN-14	As an admin, I need to provide medical advice through a chatbot.	I get medicinal recommendations through a chatbot.	medium	Sprint-3
		USN-15	As an admin, I need to provide medical recommendations by collaborating with top hospitals.	I get medical instruction through chief doctors.	low	Sprint-3
		USN-16	As an admin, I need to alert the user when they enter pandemic zones.	I got a notification when I am in the pandemic area.	Medium	Sprint-4
		USN-17	As an admin, I need to provide preventive measures when they travel through it.	I got a remedies notification when I am in the pandemic area.	high	Sprint-3
		USN18	As an admin, I need to provide special services for premium users by giving services like monitoring health by their smart bands.	I was treated special after becoming a premium member.	low	Sprint 4
	Data collections	USN-18	As an admin, I need to store all the user information on the cloud	I can access my information when I needed	Medium	Sprint-4

6.PROJECT PLANNING & SCHEDULING

'Project planning' is fundamentally about choosing and developing effective policies and methodologies to achieve project goals. While 'project scheduling' is a procedure for assigning tasks and completing them by allocating appropriate resources within an estimated budget and time frame.

6.1 SPRINT PLANNING & ESTIMATION

TITLE	DESCRIPTION	DATE
Literature Survey & Information Gathering	Literature survey on the selected project & gathering information by referring the, technical papers,research publications etc.	19 OCTOBER 2022
Prepare Empathy Map	Prepare Empathy Map Canvas to capture the user Pains & Gains, Prepare list of problem statements	18 OCTOBER 2022
Ideation	List the by organizing the brainstorming session and prioritize the top 3 ideas based on the feasibility & importance.	18 OCTOBER 2022
Proposed Solution	Prepare the proposed solution document, which includes the novelty, feasibility of idea, business model, social impact, scalability of solution, etc.	18 OCTOBER 2022
Problem Solution Fit	Prepare problem - solution fit document.	18 OCTOBER 2022

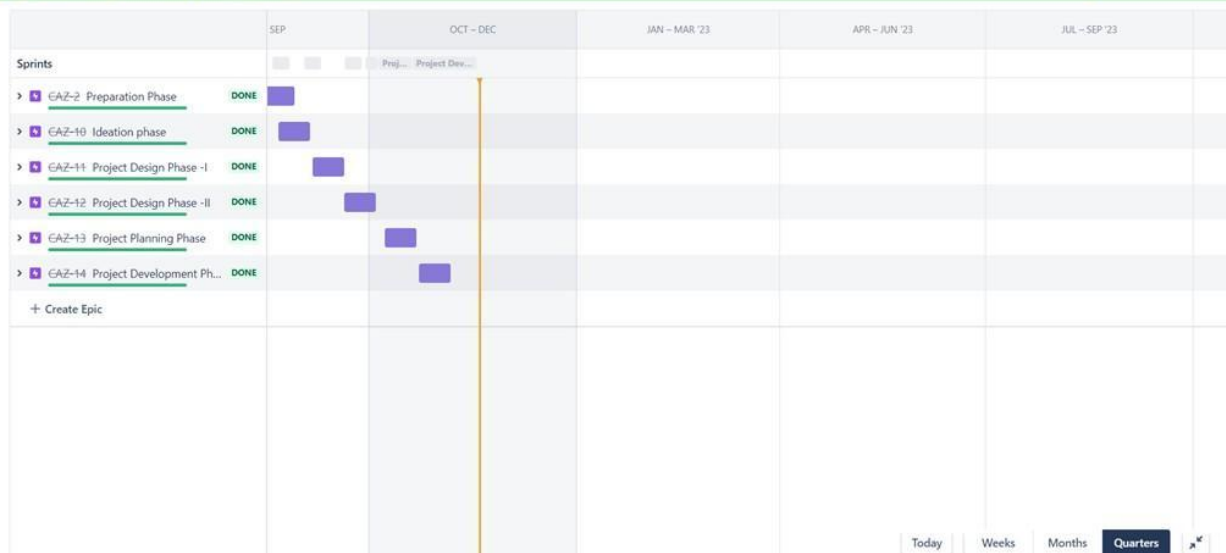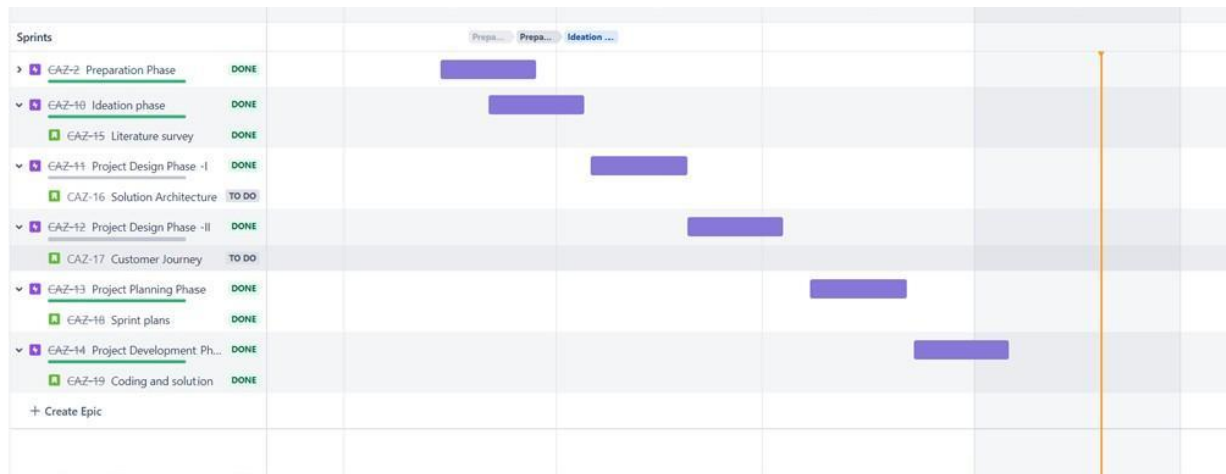|		
Solution Architecture	Prepare solution architecture document.	15 0CTOBER 2022
Customer Journey	Prepare the customer journey maps to understand the user interactions & experiences with the application (entry to exit).	24 OCTOBER 2022
Functional Requirement	Prepare the functional requirement document.	22 OCTOBER 2022
Data Flow Diagrams	Draw the data flow diagrams and submit for review.	26 OCTOBER 2022
Technology Architecture	Prepare the technology architecture diagram.	22 OCTOBER 2022
Prepare Milestone & Activity List	Prepare the milestones & activity list of the project.	31 OCTOBER 2022
Project Development - Delivery of Sprint-1, 2, 3 & 4	Develop & submit the developed code by testing it.	28 OCTOBER 2022

6.2 SPRINT DELIVERY SCHEDULE

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	User: I can register for the application by entering my email, password and verifying password.	3	High	Snekha R
		USN-2	User: I will receive a confirmation email once I have registered for the application.	2	High	Jannathul Nayeema R
		USN-3	User: I can register for the application through Gmail.	5	Medium	Siddharthan S
		USN-4	Management: I need to register my hospitals on the site.	2	High	Dhivya V
	Login	USN-5	User: I can log into the application by entering my email & password	3	High	Snekha R
		USN-6	Management: I need to login into my dashboard with my given hospital id and password.	5	Medium	Jannathul Nayeema R
	Dashboard	USN-7	User: I need to give permission to access my Contacts Location, and Storage	5	High	Siddharthan S

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-2		USN-8	User: I get access to the dashboard which shows a map with containment zones	5	High	Dhivya V
		USN-9	Management: I need to enter the case Information of the patient that visits our hospital.	5	High	Snekha R
	Services	USN-10	Admin: I need to provide valid information about the pandemic out there.	5	High	Jannathul Nayeema R
Sprint-3	Dashboard	USN-11	Management: I need to store all the patient information on the cloud.	5	High	Siddharthan S
	Services	USN-12	Admin: I need to provide medical advice through a chatbot.	5	Medium	Dhivya V
		USN-13	Admin: I need to provide medical recommendations by collaborating with top hospitals.	5	Low	Snekha R
		USN-14	Admin: I need to provide preventive measures when they travel through it.	5	High	Jannathul Nayeema R
Sprint-4	Registration	USN-15	User: I can register for the application through Facebook.	2	Low	Siddharthan S
		USN-16	User: I can register for the application through Twitter.	2	Low	Dhivya V
	Services	USN-17	Admin: I need to alert the user when they enter pandemic zones.	3	Medium	Snekha R
		USN-18	Admin: I need to provide special services for premium users by giving Services like monitoring health by their smart bands.	3	Low	Jannathul Nayeema R
	Data Collection	USN-19	Admin: I need to store all the user information on the cloud	5	Medium	Siddharthan S

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
		USN-20	Admin: I need to collect the recent list of diseases in the world.	5	Low	Dhivya V

6.3 REPORTS FROM JIRA

Sprints							
> CAZ-2 Preparation Phase	DONE						
∨ CAZ-10 Ideation phase	DONE						
CAZ-15 Literature survey	DONE						
∨ CAZ-11 Project Design Phase -I	DONE						
CAZ-16 Solution Architecture	TO DO						
∨ CAZ-12 Project Design Phase -II	DONE						
CAZ-17 Customer Journey	TO DO						
∨ CAZ-13 Project Planning Phase	DONE						
CAZ-18 Sprint plans	DONE						
∨ CAZ-14 Project Development Ph...	DONE						
CAZ-19 Coding and solution	DONE						
+ Create Epic							

	SEP	OCT – DEC	JAN – MAR '23	APR – JUN '23	JUL – SEP '23
Sprints					
> CAZ-2 Preparation Phase	DONE				
> CAZ-10 Ideation phase	DONE				
> CAZ-11 Project Design Phase -I	DONE				
> CAZ-12 Project Design Phase -II	DONE				
> CAZ-13 Project Planning Phase	DONE				
> CAZ-14 Project Development Ph...	DONE				
+ Create Epic					

Today | Weeks | Months | Quarters

7.CODING & SOLUTIONING

7.1 FEATURE 1

To track the Covid zones, to enhance and tighten the security measures. A firebase is created for the containment zone. The person who enters or exits out of that particular zone will be monitored and alert message will be sent to that person's mobile.

Add permissions in firebase

This permission allows the application to connect to the internet and save data.

<uses-permission android:name="android.permission.INTERNET"/>

Add the Google Maps location dependency.

implementation 'com.google.android.gms:play-services-location:17.0.0'

MapsActivity.kt

```kotlin
class MapsActivity : AppCompatActivity(), OnMapReadyCallback {

    private lateinit var map: GoogleMap

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_maps)
        // Obtain the SupportMapFragment and get notified when the map is ready
to be used.
        val mapFragment = supportFragmentManager
            .findFragmentById(R.id.map) as SupportMapFragment
        mapFragment.getMapAsync(this)
        setupLocClient()

    }

    private lateinit var fusedLocClient: FusedLocationProviderClient
    // use it to request location updates and get the latest location

    override fun onMapReady(googleMap: GoogleMap) {
        map = googleMap //initialise map
```

```kotlin
            getCurrentLocation()
    }
    private fun setupLocClient() {
        fusedLocClient =
            LocationServices.getFusedLocationProviderClient(this)
    }


    // prompt the user to grant/deny access
    private fun requestLocPermissions() {
        ActivityCompat.requestPermissions(this,
            arrayOf(Manifest.permission.ACCESS_FINE_LOCATION),
//permission in the manifest
            REQUEST_LOCATION)
    }

    companion object {
        private const val REQUEST_LOCATION = 1 //request code to identify
specific permission request
        private const val TAG = "MapsActivity" // for debugging
    }

    private fun getCurrentLocation() {
        // Check if the ACCESS_FINE_LOCATION permission was granted
before requesting a location
        if (ActivityCompat.checkSelfPermission(this,
                Manifest.permission.ACCESS_FINE_LOCATION) !=
            PackageManager.PERMISSION_GRANTED) {

            // call requestLocPermissions() if permission isn't granted
            requestLocPermissions()
        } else {

            fusedLocClient.lastLocation.addOnCompleteListener {
                // lastLocation is a task running in the background
                val location = it.result //obtain location
                //reference to the database
                val database: FirebaseDatabase = FirebaseDatabase.getInstance()
                val ref: DatabaseReference = database.getReference("test")
                if (location != null) {

                    val latLng = LatLng(location.latitude, location.longitude)
                    // create a marker at the exact location
```
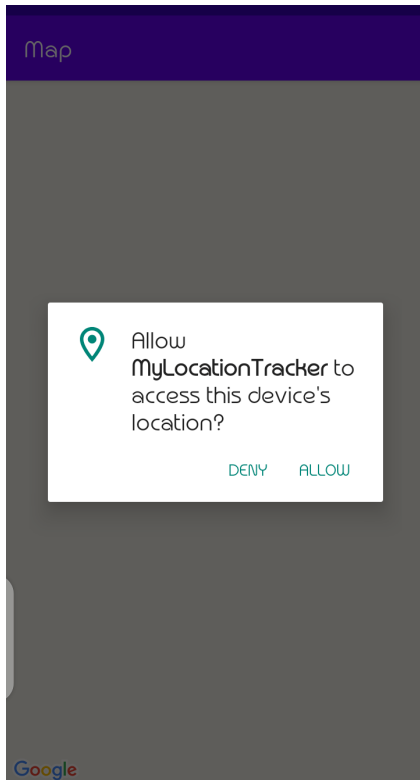
```
map.addMarker(MarkerOptions().position(latLng)
```

```kotlin
                                            .title("You are currently here!"))
                                        // create an object that will
                                        specify how the camera will be
        16.0f)                          updated val update =
                                        CameraUpdateFactory.newLat
                                        LngZoom(latLng,

                map.moveCamera(update)

                //Save the location data to the database
                ref.setValue(location)
            } else {

                // if location is null , log an error message
                Log.e(TAG, "No location found")
            }




        }
      }
    }


    override fun onRequestPermissionsResult(
        requestCode: Int,
        permissions: Array<String>,
        grantResults: IntArray) {
        //check if the request code matches the REQUEST_LOCATION
        if (requestCode == REQUEST_LOCATION)
        {
            //check if grantResults contains PERMISSION_GRANTED.If it does,
call getCurrentLocation()
            if (grantResults.size == 1 && grantResults[0] ==
                PackageManager.PERMISSION_GRANTED) {
                getCurrentLocation()
            } else {

                //if it doesn`t log an error message

                Log.e(TAG, "Location permission has been denied")
            }
```

RUN THE APP

Map

You are currently here!

By Faith Shop

bis Ruai

Prime Auto Solutions

Kangundo Rd

Precious Life
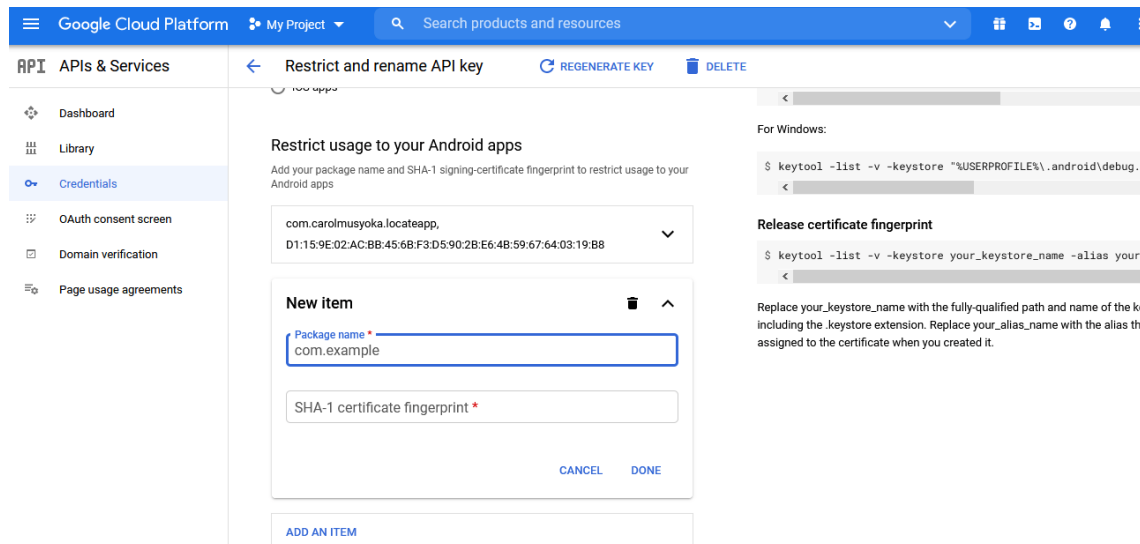Medical Centre H

Flexx Mart
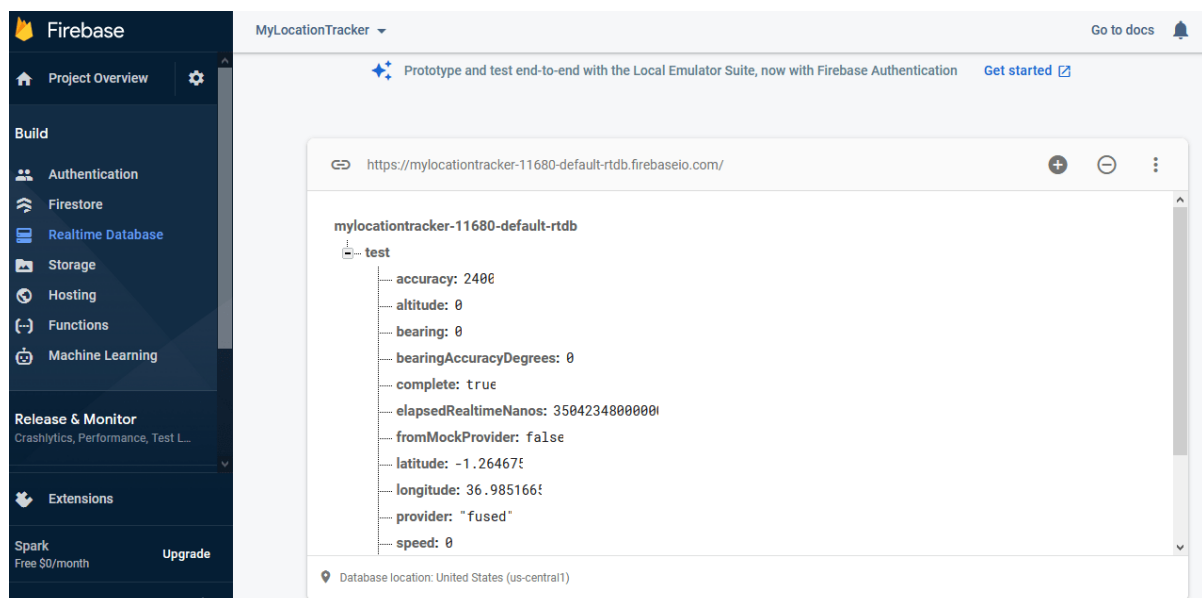
Absa | Atm | Ruai

Google

FEATURE-2

User uploads locally stored tracked locations and home address after testing positive for COVID-19. These locations are stored in cloud storage. Note that, no other user information except the locations are accessible by other users.

DATABASE CONNECTION

7.3 DATABASE SCHEMA

8. TESTING

Testing is finding out how well something works. Testing in Software Engineering is defined as an activity to check whether the actual results match the expected results.

8.1 TEST CASES

A test case includes information such as test steps, expected results and data while a test scenario only includes the functionality to be tested.

1. Login button click with wrong credentials entered.

2. Signup with already registered mail ID.

3. Signup with wrong form data entered.

4. Entering home page with logged out session.

5. Clicking home page buttons with logged out session.

6. Invalid data entered in change password page and requested for change in password.

8.2 USER ACCEPTANCE TESTING

User Acceptance Testing (UAT) is a process to check whether the system accepts a user's requirements.

User acceptance testing is the final testing stage in software development before production. It's used to get feedback from users who test the software and its user interface (UI). UAT is usually done manually, with users creating real-worldsituations and testing how the software reacts and performs.

S.NO	TEST CASE	REQUIRED OUTPUT	RESULT OUTPUT	STATUS
1	Login button click with wrong credentials	Wrong credentials entered notification	Wrong credentials entered notification	ACCEPTED
2	Signup with already registered mail ID.	Email already registered notification	Email already registered notification	ACCEPTED
3	Signup with wrong form data entered.	Wrong credentials entered notification	Wrong credentials entered notification	ACCEPTED
4	Entering home page with logged out session.	Take user to login page	Take user to login page	ACCEPTED
5	Clicking home page buttons with logged out session.	Take user to login page	Take user to login page	ACCEPTED
6	Invalid data entered in change password page and requested for change in password.	Wrong form data entered notification	Wrong form data entered notification	ACCEPTED

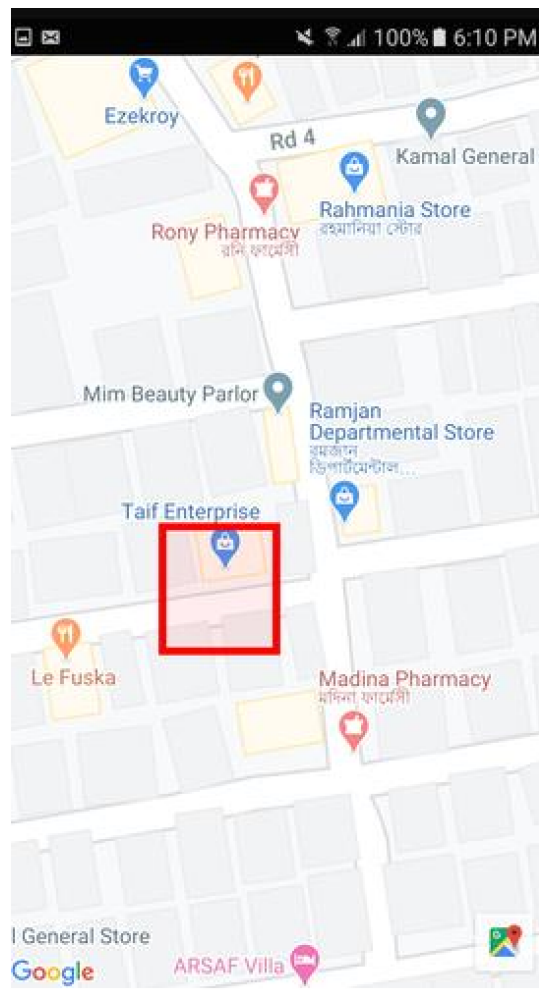| Scenario	Test Step	Expected Result	Actual Outcome
Verify that the input field that can accept maximum of 10 characters	Login to application and key in 10 characters	Application should be able to accept all 10 characters.	Application accepts all 10 characters.
Verify that the input field that can accept maximum of 11 characters	Login to application and key in 11 characters	Application should NOT accept all 11 characters.	Application accepts all 10 characters.

9.RESULT

Result is an ideal result that the tester should get after the test case is performed. It's usually documented together with the test case. It's usually compared with actual result, and if the actual result differs from the expected one, the difference is documented and called a bug.
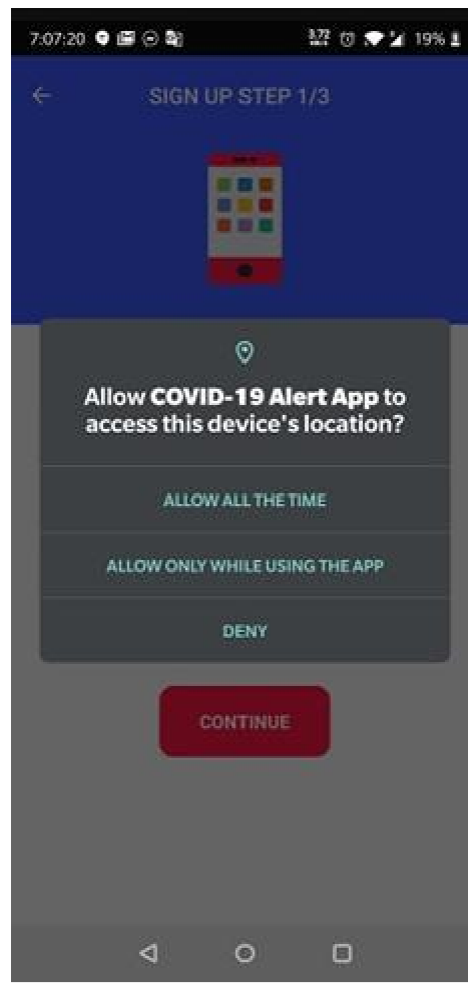
Infected-locations

map-boxed-area

Permission for location access

DB CONNECTION

9.1 PERFORMANCE METRICS

The performance metrics definition refers to the measurement of behavior, activities, and overall performance of a business**.**
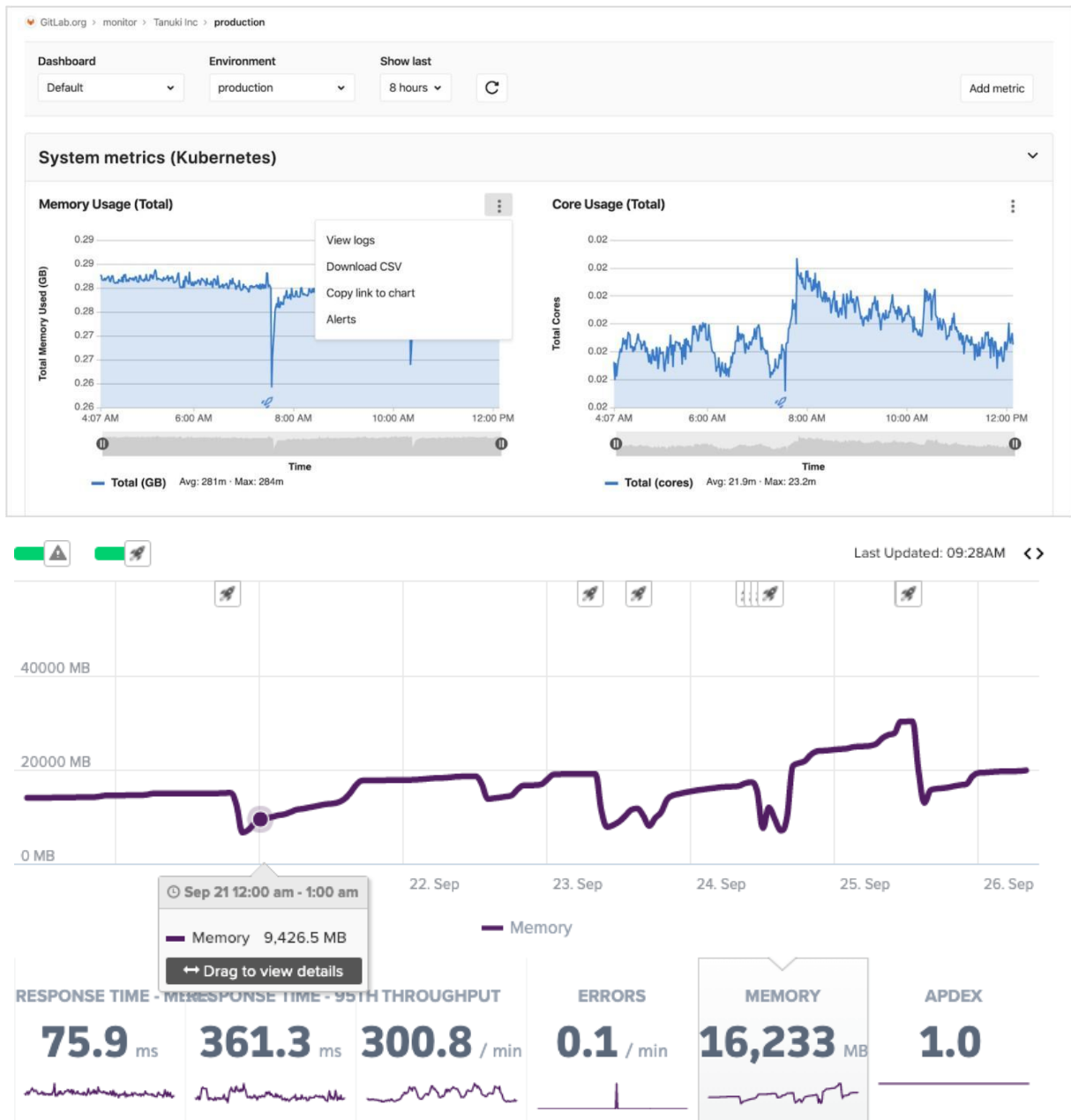
10. ADVANTAGE & DISADVANTAGE

ADVANTAGES

- Users can know if they have been near a person suspected to be affected by COVID-19.
- It sends separate notification alerts to the user on entering.
- It is the easiest tool to predict COVID-19 Contaminant zones.
- Users will receive a real-time notification whenever they are in the same location as an infected user.
- Exposure notifications are delivered more effectively if the process is automatic. It makes sense – rather than having to call each person individually, an app may alert everyone that's been in close proximity to an infected person.

DISADVANTAGES

There are some privacy concerns including: lack in privacy

- Access to personal information and geographical location.
- User's data exposure.
- Mostly regarding the centralisation vs. decentralisation of data. For the most part, though, academics agree that moving away from location-based contact tracing apps is essential for user privacy.

11. CONCLUSION

This app is intended to alert people about containment zones in a specific region by continuously monitoring an individual's location. The application is developed on Android SDK and uses Firebase Cloud Firestore to store the location data. Android's geofencing client is used to create geofences, the containment zones and notification manager is used to provide notifications. The application's key benefits include monitoring people's activity and alerting them to their safety movements. Through the app's global news feed, relief requests can be posted without directly sharing personal or family information of a user. A contact button is attached to relief posts through which any other user can call and contact the relief request post's author and reach out for help. This feature especially targets the middle-class families that are suffering greatly in silence and cannot seek help publicly. A user is allowed to make only

one relief post every seven days, this is a measure taken to stop misuse of the feature.

12.FUTURE SCOPE

The application efficiently displays the identified Covid-19 containment zones to users in a Google map. With the alarming increase in Covid-19 affected cases around the world, this developed application can be used to raise social awareness among the general public. This application also monitors the user's location and determines whether it is in the list of identified containment zones. On entering, it sends the user separate notification alerts. The developed Android application also extracts the trespasser's email address in the containment zones, which can be used by to track and identify people who frequently trespass the containment zones. As a result, this application identifies the containment zones and emphasises the importance of taking additional precautionary measures to combat Covid-19. The application has been tested in several locations and has proven to produce accurate result.

9.APPENDIX

Creating a Location-tracking App using Firebase and Google Maps in Android.

Step 1 - Creating a new project
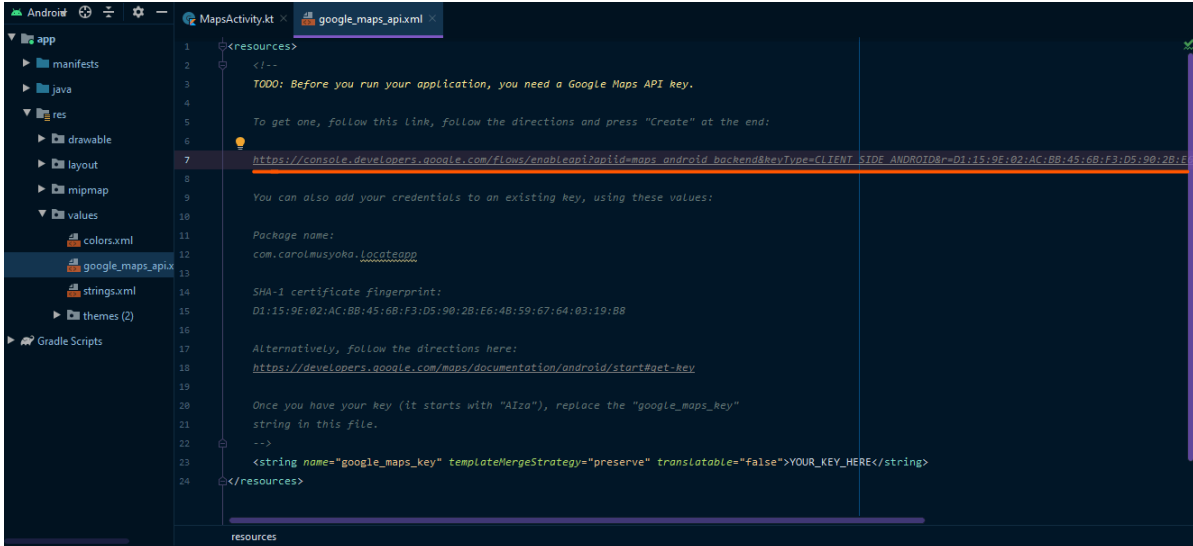Using the google map template
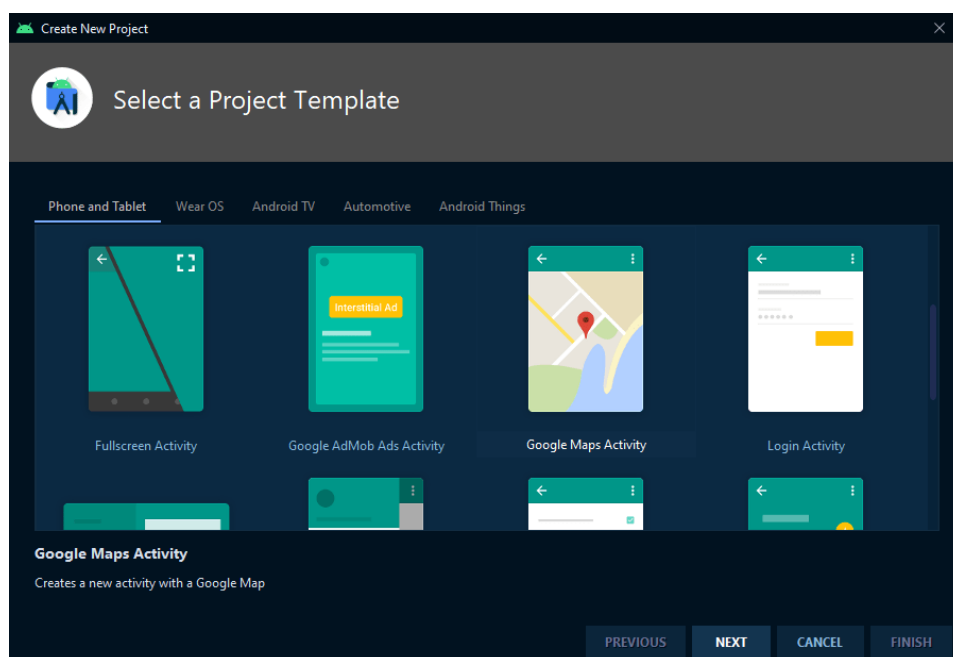
com.google.android.geo.API_KEY specifies the API key.

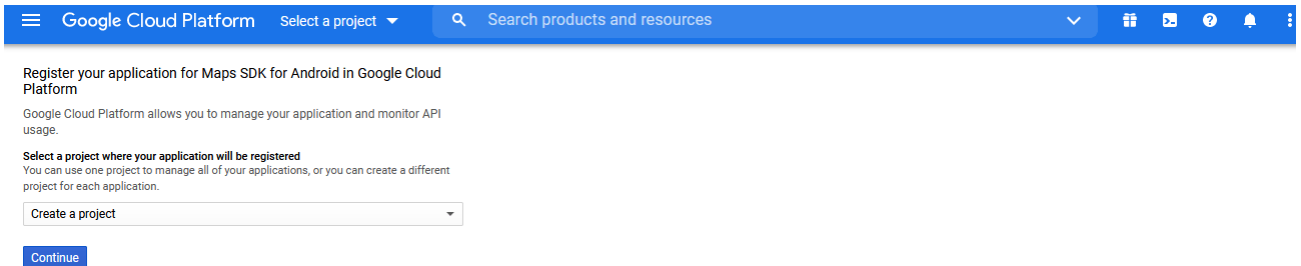**implementation 'com.google.android.gms:play-services-maps:17.0.0'**

Step-2 Create an API key

Open res/values/google_maps_api.xml.

This file will contain your API key

API key to call the API.

Step 3 - Creating a Firebase project

Step 4 - Connect the Firebase project to the app

Go to tools>firebase
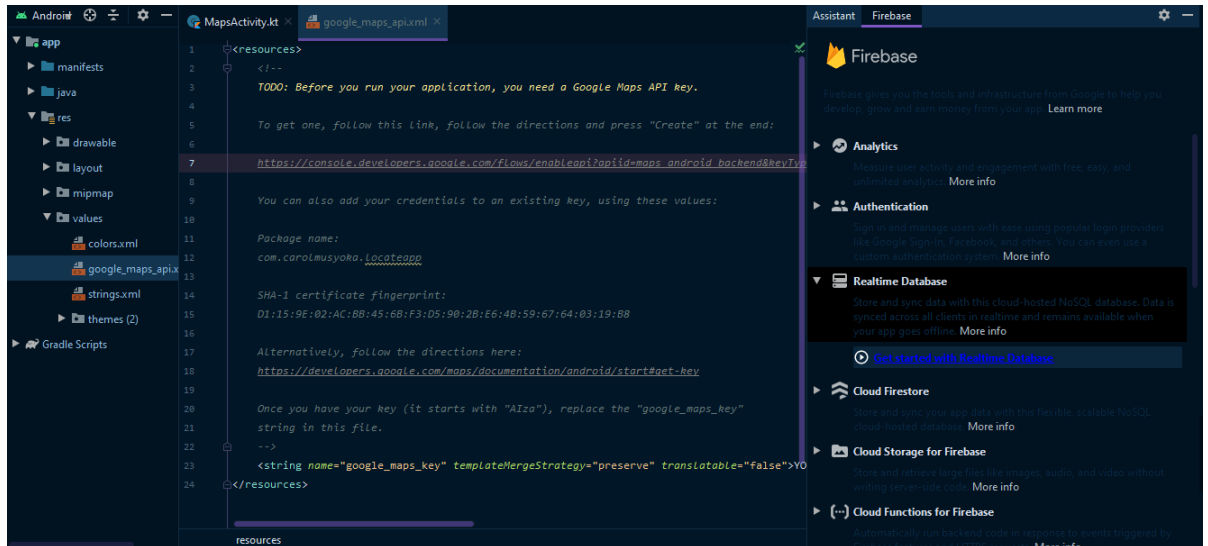
Step 5 - Add permissions

Add the internet permission.

This permission allows the application to connect to the internet and save data.

<uses-permission android:name="android.permission.INTERNET"/>

Add the Google Maps location dependency.

implementation 'com.google.android.gms:play-services-location:17.0.0'

Step 6 - The MapsActivity

Navigate to MapsActivity.kt

class MapsActivity : AppCompatActivity(), OnMapReadyCallback {

   private lateinit var map: GoogleMap

   override fun onCreate(savedInstanceState: Bundle?) {
     super.onCreate(savedInstanceState)
     setContentView(R.layout.activity_maps)
     // Obtain the SupportMapFragment and get notified when the map is ready
to be used.

```kotlin
        val mapFragment = supportFragmentManager
            .findFragmentById(R.id.map) as SupportMapFragment
        mapFragment.getMapAsync(this)
        setupLocClient()

    }

    private lateinit var fusedLocClient: FusedLocationProviderClient
    // use it to request location updates and get the latest location

    override fun onMapReady(googleMap: GoogleMap) {
        map = googleMap //initialise map
        getCurrentLocation()
    }
    private fun setupLocClient() {
        fusedLocClient =
            LocationServices.getFusedLocationProviderClient(this)

    }

    // prompt the user to grant/deny access
    private fun requestLocPermissions() {
        ActivityCompat.requestPermissions(this,
            arrayOf(Manifest.permission.ACCESS_FINE_LOCATION),
//permission in the manifest
            REQUEST_LOCATION)
    }

    companion object {
        private const val REQUEST_LOCATION = 1 //request code to identify
specific permission request
        private const val TAG = "MapsActivity" // for debugging
    }

    private fun getCurrentLocation() {
        // Check if the ACCESS_FINE_LOCATION permission was granted
before requesting a location
        if (ActivityCompat.checkSelfPermission(this,
            Manifest.permission.ACCESS_FINE_LOCATION) !=
            PackageManager.PERMISSION_GRANTED) {

            // call requestLocPermissions() if permission isn't granted
            requestLocPermissions()
        } else {
```

```kotlin
        fusedLocClient.lastLocation.addOnCompleteListener {
            // lastLocation is a task running in the background
            val location = it.result //obtain location
            //reference to the database

            val database: FirebaseDatabase = FirebaseDatabase.getInstance()
            val ref: DatabaseReference = database.getReference("test")
            if (location != null) {

                                            val latLng = LatLng(location.latitude,
                                            location.longitude)
                                            // create a marker at the exact location
                                            map.addMarker(MarkerOptions().positio
                                            n(latLng)
                                                .title("You are currently here!"))
16.0f)                                      // create an object that will
                                            specify how the camera will be
                                            updated val update =
                                            CameraUpdateFactory.newLat
                                            LngZoom(latLng,

                map.moveCamera(update)

                //Save the location data to the database
                ref.setValue(location)
            } else {

                // if location is null , log an error message
                Log.e(TAG, "No location found")
            }


        }
    }
}


    override fun onRequestPermissionsResult(
        requestCode: Int,
        permissions: Array<String>,
        grantResults: IntArray) {
        //check if the request code matches the REQUEST_LOCATION
        if (requestCode == REQUEST_LOCATION)
        {

            //check if grantResults contains PERMISSION_GRANTED.If it does,
```

```
call getCurrentLocation()
        if (grantResults.size == 1 && grantResults[0] ==
            PackageManager.PERMISSION_GRANTED) {
```

```
        getCurrentLocation()
    } else {
        //if it doesn`t log an error message
        Log.e(TAG, "Location permission has been denied")
    }
  }
 }
}
```

Step 7 - Run the app

Run the app. This is will achieve (locations may differ). Give the app location permission.
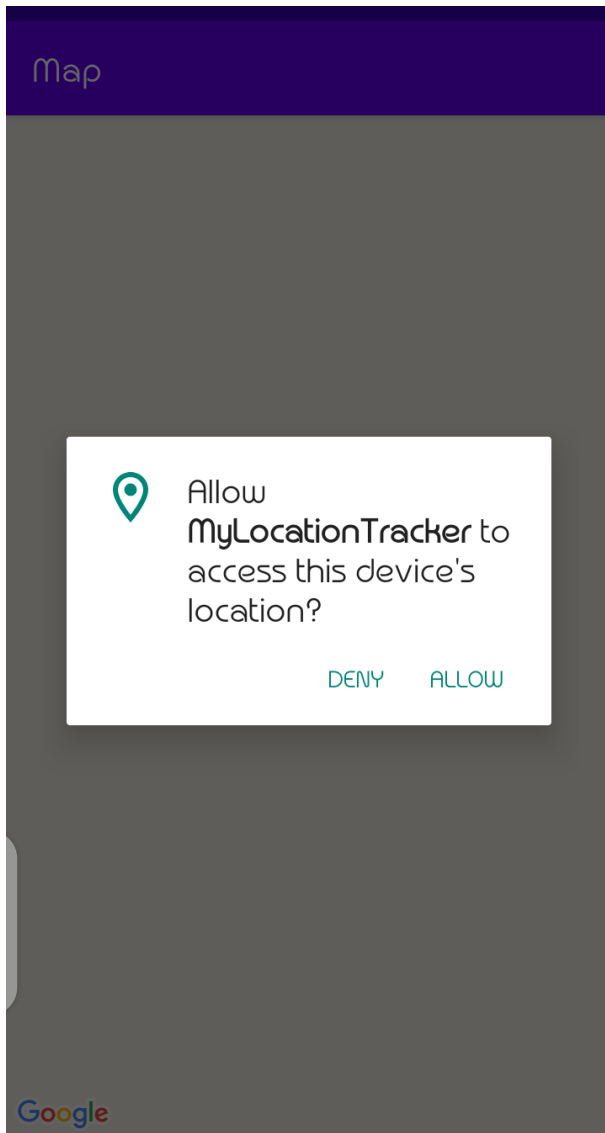
Successfully saved the user's location in a database. Navigate to the Firebase console and click on the project had created.
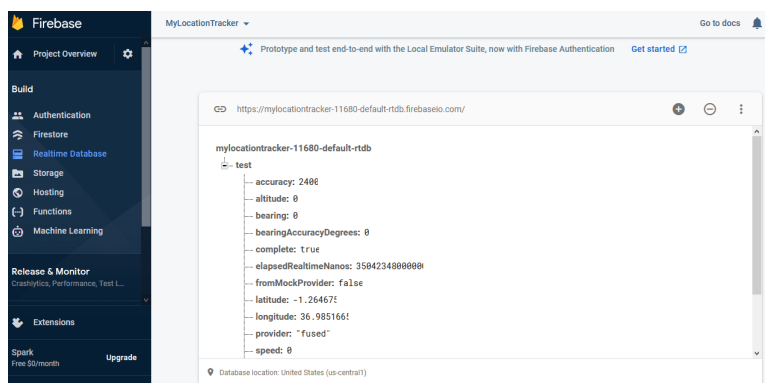
The LocationChecker app

This second application allows you to retrieve the user's location from the database.

Step 1: Creating a new project

Follow the process discussed above to create a new project. Make sure you select the Google Maps template and name it appropriately.

Step 2: Add credentials to an existing key

Since we already have an API key, we can just include it in the console. Open your developer's console and click on the edit icon.
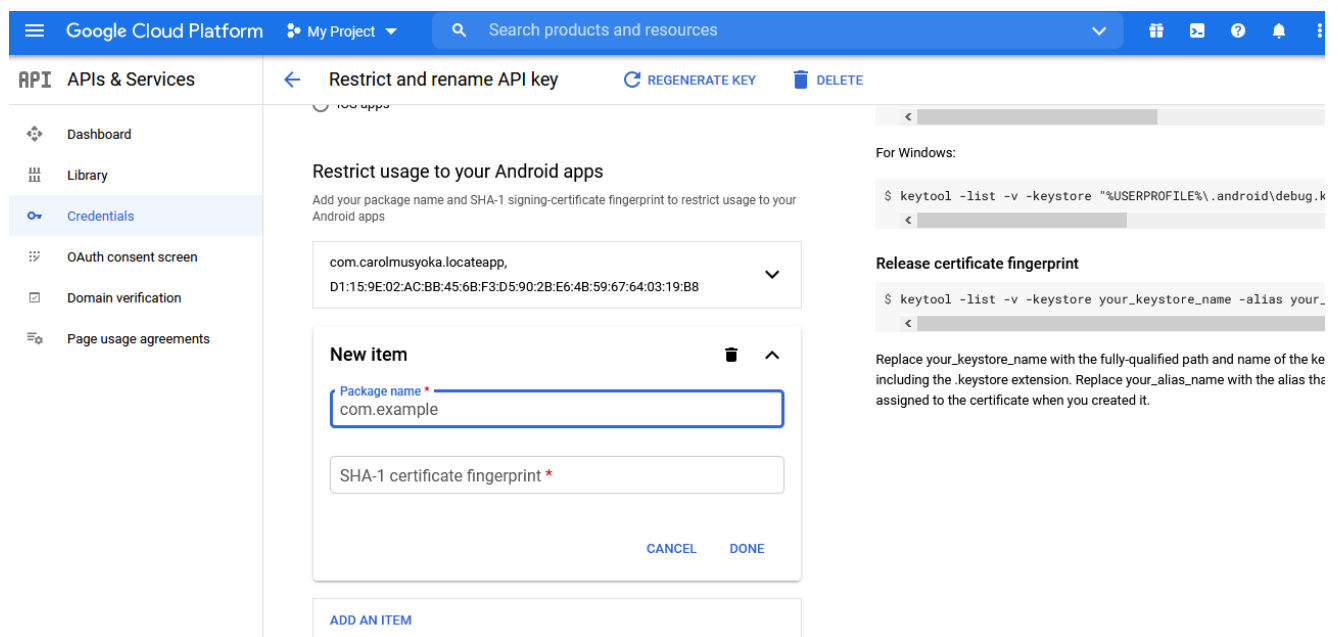
Step 3: Adding a button

Here is the **activity_maps.xml**:

<?xml version="1.0" encoding="utf-8"?>

<androidx.constraintlayout.widget.ConstraintLayout

   xmlns:android="http://schemas.android.com/apk/res/android"

   android:layout_width="match_parent"

```xml
    xmlns:map="http://schemas.android.com/apk/res-auto"

    android:layout_height="match_parent"

    tools:context=".MapsActivity"

    xmlns:tools="http://schemas.android.com/tools">


<fragment

    android:id="@+id/map"

    android:name="com.google.android.gms.maps.SupportMapFragment"

    android:layout_width="match_parent"

    android:layout_height="match_parent"

    map:layout_constraintLeft_toLeftOf="parent"

    map:layout_constraintRight_toRightOf="parent"

    map:layout_constraintTop_toTopOf="parent"

    map:layout_constraintBottom_toBottomOf="parent" />
<Button

    android:layout_width="wrap_content"

      map:layout_constraintLeft_toLeftOf="parent"

      map:layout_constraintRight_toRightOf="parent"

      map:layout_constraintBottom_toBottomOf="parent"

      android:padding="20dp"

      android:id="@+id/btn_find_location"

      android:text="@string/find_user_s_location"

      android:layout_height="wrap_content" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Step 4: Adding permissions

By default, the GoogleMaps activity template adds the ACCESS_FINE_LOCATION permission in the AndroidManifest.xml file. Since we need the internet to read from the database, add the internet permission, as shown below:

```
<uses-permission android:name="android.permission.INTERNET"/>
```

Step 4: The model class

```
import com.google.firebase.database.IgnoreExtraProperties

@IgnoreExtraProperties

data class LocationInfo(

    var latitude: Double? = 0.0,

    var longitude: Double? = 0.0

)
```

Step 5: The MapsActivity

The following code:

```
class MapsActivity : AppCompatActivity(), OnMapReadyCallback {

  private lateinit var map: GoogleMap

    private var database: FirebaseDatabase = FirebaseDatabase.getInstance()

    private var dbReference: DatabaseReference = database.getReference("test")

    private lateinit var find_location_btn: Button

      override fun onCreate(savedInstanceState: Bundle?) {

      super.onCreate(savedInstanceState)

      setContentView(R.layout.activity_maps)

 find_location_btn = findViewById(R.id.btn_find_location)
```

```kotlin
        // Obtain the SupportMapFragment and get notified when the map is ready to
be used.

        val mapFragment = supportFragmentManager

            .findFragmentById(R.id.map) as SupportMapFragment

        mapFragment.getMapAsync(this)

        // Get a reference from the database so that the app can read and write
operations

        dbReference = Firebase.database.reference

        dbReference.addValueEventListener(locListener)

    }
 val locListener = object : ValueEventListener {

    //    @SuppressLint("LongLogTag")

    override fun onDataChange(snapshot: DataSnapshot) {

        if(snapshot.exists()){

        //get the exact longitude and latitude from the database "test"

            val location =
snapshot.child("test").getValue(LocationInfo::class.java)

            val locationLat = location?.latitude

            val locationLong = location?.longitude

            //trigger reading of location from database using the button

            find_location_btn.setOnClickListener {

              // check if the latitude and longitude is not null

                if (locationLat != null && locationLong!= null) {

                // create a LatLng object from location

                    val latLng = LatLng(locationLat, locationLong)
```

```
                                        //create a marker at the

                                        read location and display

                                        it on the map

                                        map.addMarker(MarkerO

                                        ptions().position(latLng)
16.0f)
                                            .title("The user is currently
                                            here"))

                                            //specify how the map camera is
                                            updated

                                        val update =
                                        CameraUpdateFactory.newLatLngZoo
                                        m(latLng,


                                        //update the

                                        camera with

                                        the

                                        CameraUpdate

                                        object

                                        map.moveCam

                                        era(update)
                                    }
            else {
                // if location is null , log an error message
                Log.e(TAG, "user location cannot be found")
            }
        }
    }
}
// show this toast if there is an error while reading from the database
```

```kotlin
    override fun onCancelled(error: DatabaseError) {

        Toast.makeText(applicationContext, "Could not read from database",
Toast.LENGTH_LONG).show()

    } }

override fun onMapReady(googleMap: GoogleMap) {

    map = googleMap //initialize map when the map is ready }

  companion object {
```

// TAG is passed into the Log.e methods used above to print information to the Logcat window

        private const val TAG = "MapsActivity" // for debugging

    }

SOURCE CODE

SignUpActivity.java

package com.example.covid_19alertapp.activities;

import androidx.annotation.NonNull;

import androidx.annotation.Nullable;

import androidx.appcompat.app.AppCompatActivity;

import android.Manifest;

import android.annotation.SuppressLint;

import android.content.Context;

import android.content.Intent;

import android.content.SharedPreferences;

import android.os.Bundle;

import android.text.Editable;

import android.text.TextWatcher;

import android.util.Log;

import android.view.View;

import android.view.inputmethod.InputMethodManager;

import android.widget.Button;

import android.widget.EditText;

import android.widget.TextView;

import android.widget.Toast;

import com.example.covid_19alertapp.R;

import com.example.covid_19alertapp.extras.Constants;

import com.example.covid_19alertapp.extras.LogTags;

import com.example.covid_19alertapp.extras.Permissions;

```java
import com.google.firebase.FirebaseException;
import com.google.firebase.auth.PhoneAuthCredential;
import com.google.firebase.auth.PhoneAuthProvider;

import java.util.concurrent.TimeUnit;
public class SignUpActivity extends AppCompatActivity {
Button btnContinue,btnHomeSignup,btnForwardSignup;
    EditText phoneNumber;
    TextView textViewTermsCond;
    public static String PHONE_NUMBER,verification;

    public static boolean ISRETURNEDFROMVERLAYOUT;
    public static SharedPreferences loginSp,userInfo;
    PhoneAuthProvider.OnVerificationStateChangedCallbacks mCallbacks;
  @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_sign_up);
// ask permissions
        promptPermissions();
        phoneNumber = findViewById(R.id.editText_phoneNumber);
        btnContinue = findViewById(R.id.btn_continue);
        textViewTermsCond = findViewById(R.id.TextViewTerm);
        btnHomeSignup = findViewById(R.id.home_button_signup_page);
    btnForwardSignup = findViewById(R.id.forward_button_signup_page);

loginSp=getSharedPreferences(Constants.USER_LOGIN_INFO_SHARED
_PREFERENCES,MODE_PRIVATE);
userInfo=getSharedPreferences(Constants.USER_INFO_SHARED_PREF
ERENCES,MODE_PRIVATE);
if(loginSp.getBoolean(Constants.user_login_state_shared_preference
startActivity(new Intent(getApplicationContext(),
VerificationPageActivity.class));
            finish();
```

```java
            }
mCallbacks=new
PhoneAuthProvider.OnVerificationStateChangedCallbacks() {
        @Override
 public void onVerificationCompleted(@NonNull PhoneAuthCredential
phoneAuthCredential) {

Toast.makeText(getApplicationContext(),"Successful",Toast.LENGTH_S
HORT).show();
        }@Override
        public void onVerificationFailed(@NonNull FirebaseException e) {
Toast.makeText(getApplicationContext(),"Check Your Internet
Connection",Toast.LENGTH_SHORT).show();
            btnContinue.setEnabled(true); }
        @Override
        public void onCodeSent(@NonNull String s, @NonNull
PhoneAuthProvider.ForceResendingToken forceResendingToken) {
            super.onCodeSent(s, forceResendingToken);

            verification=sToast.makeText(getApplicationContext(),"Code

Sent to the Number",Toast.LENGTH_SHORT).show();

            startActivity(new Intent(getApplicationContext(),
VerificationPageActivity.class));

loginSp.edit().putBoolean(Constants.user_login_state_shared_preference,tr
ue).apply();
            btnContinue.setEnabled(true)
 finish();
        } };
if(ISRETURNEDFROMVERLAYOUT)
    {
        PHONE_NUMBER=PHONE_NUMBER.substring(0,4)+"
"+PHONE_NUMBER.substring(4);
        phoneNumber.setText(PHONE_NUMBER);
        ISRETURNEDFROMVERLAYOUT = false;
```

```java
                btnHomeSignup.setVisibility(View.INVISIBLE);

                btnForwardSignup.setVisibility(View.VISIBLE);

                btnForwardSignup.setOnClickListener(new
View.OnClickListener() {

                    @Override

                    public void onClick(View v) {

                        startActivity(new Intent(getApplicationContext(),
VerificationPageActivity.class));
loginSp.edit().putBoolean(Constants.user_login_state_shared_preference,true).apply();
finish();

                    }

                });

            }

    phoneNumber.clearFocus();
phoneNumber.setSelection(phoneNumber.getText().toString().length());
        phoneNumber.addTextChangedListener(new TextWatcher() {

            @Override

            public void beforeTextChanged(CharSequence s, int start, int count,
int after) {

            }

            //l

            int countB=phoneNumber.getText().toString().length(),countA=0;

            @SuppressLint("SetTextI18n")

     @Override

            public void onTextChanged(CharSequence s, int start, int before,
int count) {
if(phoneNumber.getText().toString().length()<5)

                {

                    phoneNumber.setText("+880 ");


phoneNumber.setSelection(phoneNumber.getText().toString().length());

                }
```

```java
        countA = phoneNumber.getText().toString().length();
        if(phoneNumber.getText().toString().length()==9 &&
countA>countB)
        {
            phoneNumber.setText(phoneNumber.getText().toString()+"-
");

phoneNumber.setSelection(phoneNumber.getText().toString().length());
        }
        countB = countA;
        if(phoneNumber.getText().toString().length()==16)
        {
            hideSoftInput();
        }
    }
    @Override
    public void afterTextChanged(Editable s) { }
});
phoneNumber.setOnFocusChangeListener(new
View.OnFocusChangeListener() {
    @Override
    public void onFocusChange(View v, boolean hasFocus) {
        if(hasFocus) phoneNumber.setCursorVisible(true);
        else phoneNumber.setCursorVisible(false);
    }
});
btnContinue.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {

        if(phoneNumber.getText().toString().length()==16) //Write a
function to check phone number validity
        {
```

```java
            PHONE_NUMBER = phoneNumber.getText().toString();
            PHONE_NUMBER=PHONE_NUMBER.replaceAll("\\s+","");
            System.out.println(PHONE_NUMBER);


userInfo.edit().putString(Constants.user_phone_no_preference,PHONE_NUMBER).apply();
            sendSms(PHONE_NUMBER);
            btnContinue.setEnabled(false);


        }
        else
        {
          phoneNumber.setError("Invalid Number!");
        }
      }
    });


    textViewTermsCond.setOnClickListener(new View.OnClickListener()
{
      @Override
      public void onClick(View v) {
        //Write Terms and Condition Page Function

textViewTermsCond.setTextColor(getResources().getColor(R.color.colorInactive));
      }
    });
btnHomeSignup.setOnClickListener(new View.OnClickListener() {
      @Override
      public void onClick(View v) {
        finish();
      }
```

```java
    }); }
 public void hideSoftInput() {
     View view1 = this.getCurrentFocus();
     if(view1!= null){
         InputMethodManager imm = (InputMethodManager)
getSystemService(Context.INPUT_METHOD_SERVICE);
         imm.hideSoftInputFromWindow(view1.getWindowToken(), 0);
     }
   }
public void sendSms(String phoneNo){
PhoneAuthProvider.getInstance().verifyPhoneNumber(
         phoneNo,       // Phone number to verify
         60,            // Timeout duration
         TimeUnit.SECONDS,   // Unit of timeout
         this,          // Activity (for callback binding)
         mCallbacks        // OnVerificationStateChangedCallbacks
     );
}
 /*
   permission needed at start of app
    */
 private Permissions permissions;
   private static final String[] permissionStrings = {
         Manifest.permission.ACCESS_FINE_LOCATION,
         Manifest.permission.ACCESS_BACKGROUND_LOCATION,
         Manifest.permission.ACCESS_WIFI_STATE,
         Manifest.permission.CALL_PHONE
   };
private void promptPermissions() {
permissions = new Permissions(this, permissionStrings,
Constants.PERMISSION_CODE);
 if(!permissions.checkPermissions())
```

```java
        permissions.askPermissions();
 }
  @Override
    public void onRequestPermissionsResult(int requestCode, @NonNull
String[] permissions, @NonNull int[] grantResults) {
     //resolve unresolved permission
switch (requestCode){
 case Constants.PERMISSION_CODE:
  try {
      this.permissions.resolvePermissions(permissions, grantResults);
         }catch (Exception e){
             Log.d(LogTags.Permissions_TAG,
"onRequestPermissionsResult: "+e.getMessage());
         }
 break;
 } }}
```

UserInfoFormActivity.java

```java
package com.example.covid_19alertapp.activities;

import androidx.annotation.Nullable;

import androidx.appcompat.app.AppCompatActivity;


import android.content.Context;

import android.content.Intent;

import android.content.SharedPreferences;

import android.graphics.drawable.Drawable;

import android.os.Bundle;
```

```java
import android.os.Handler;

import android.util.Log;

import android.view.View;

import android.view.inputmethod.InputMethodManager;

import android.widget.Button;

import android.widget.EditText;

import android.widget.TextView;

import android.widget.Toast;

import com.example.covid_19alertapp.R;

import com.example.covid_19alertapp.extras.AddressReceiver;

import com.example.covid_19alertapp.models.UserInfoData;

import com.example.covid_19alertapp.extras.Constants;

import com.example.covid_19alertapp.extras.LogTags;

import com.google.firebase.auth.FirebaseAuth;

import com.google.firebase.database.DatabaseReference;

import com.google.firebase.database.FirebaseDatabase;


public class UserInfoFormActivity extends AppCompatActivity implements AddressReceiver.AddressView {

    EditText dobText,userName; TextView

    workAddress,homeAddress; Button

    save_profile;

    UserInfoData userInfoData;
```

```java
FirebaseDatabase database;

DatabaseReference userInfoRef;

String uid= FirebaseAuth.getInstance().getCurrentUser().getUid();

String path="UserInfo";

public static SharedPreferences userInfo;

private String homeLatLng = "", workLatLng =
"", homeAddressVariable = "", workAddressVariable = "";

// address picker keys

private static final int HOME_ADDRESS_PICKER = 829;

private static final int WORK_ADDRESS_PICKER = 784;

// address picker icon

Drawable checkedIcon;

// latLng to address fetcher

AddressReceiver addressReceiver = new AddressReceiver(new
Handler(), this);

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

    setContentView(R.layout.activity_user_info_form);

    dobText= findViewById(R.id.dateOfBirth);

    userName = findViewById(R.id.userName);

    workAddress = findViewById(R.id.workAdress);

    homeAddress = findViewById(R.id.homeAddress);

    save_profile = findViewById(R.id.SaveProfButton);
```

```java
userInfo=getSharedPreferences(Constants.USER_INFO_SHARED_PREF
ERENCES,MODE_PRIVATE);

checkedIcon=getApplicationContext().getResources().getDrawable(R.draw
able.ic_check_black_24dp);

    homeAddress.setOnClickListener(new View.OnClickListener() {

      @Override

      public void onClick(View v) {

 // home address click

        Intent   homeIntent  =  new  Intent(UserInfoFormActivity.this,
AddressPickerMapsActivity.class);

        startActivityForResult(homeIntent,HOME_ADDRESS_PICKER);
}

    });


    workAddress.setOnClickListener(new View.OnClickListener() {

      @Override

      public void onClick(View v) {


        // work address click

 Intent    workIntent   =   new    Intent(UserInfoFormActivity.this,
AddressPickerMapsActivity.class);

        startActivityForResult(workIntent,
WORK_ADDRESS_PICKER);

 }
```

```java
} save_profile.setOnClickListener(new View.OnClickListener() {

    @Override

    public void onClick(View v) {

        if(homeLatLng.equals("") || homeAddressVariable.equals("") || RequiredEditText(userName) || RequiredEditText(dobText))

        {

            if(homeLatLng.equals(""))

                homeAddress.setError("Required");

            else if(homeAddressVariable.equals("")) {

                Toast.makeText(UserInfoFormActivity.this,

                        "please wait as we fetch your address",

                        Toast.LENGTH_LONG)

                        .show();

            }


            return;

        }


        final String name,day,month,year,dateOfBirth,contactNumber;

        name=userName.getText().toString();

        dateOfBirth=dobText.getText().toString()

contactNumber=userInfo.getString(Constants.user_phone_no_preference, "Not Defined

 if(workLatLng.equals("")){
```

```java
        userInfoData=new
UserInfoData(name,dateOfBirth,homeLatLng,contactNumber,
homeAddressVariable)

 }

 else {

userInfoData = new UserInfoData(name, dateOfBirth, workLatLng,
homeLatLng,       contactNumber,       homeAddressVariable,
workAddressVariable);


userInfo.edit().putString(Constants.user_work_address_latlng_preference,
workLatLng).apply();


userInfo.edit().putString(Constants.user_work_address_preference,workA
ddressVariable).apply();

        }

        //applying values to the info names Shared Preference

userInfo.edit().putString(Constants.username_preference,name).apply();




userInfo.edit().putString(Constants.username_preference,name).apply();


userInfo.edit().putString(Constants.user_dob_preference,dateOfBirth).app
ly();


userInfo.edit().putString(Constants.user_home_address_latlng_preference,
homeLatLng).apply();
```

```java
            userInfo.edit().putString(Constants.uid_preference,uid).apply();

//userInfo.edit().putString(Constants.user_phone_no_preference,PHONE_
NUMBER).apply();

userInfo.edit().putBoolean(Constants.user_exists_preference,true).apply();


        // set the home address fetched using intent service

userInfo.edit().putString(Constants.user_home_address_preference,
homeAddressVariable).apply();


        database = FirebaseDatabase.getInstance();

        userInfoRef = database.getReference(path).child(uid);

        userInfoRef.setValue(userInfoData);



        startActivity(new                       Intent(getApplicationContext(),
MenuActivity.class));

        finish();
}
  //Home Address field's onCLick function
   public void setHomeAddress(View v)
}
  //Work ADDress field's onlick funcion
```

```java
    public void setWorkAddress(View v){

 }

@Override

    protected void onActivityResult(int requestCode, int resultCode,
@Nullable Intent data) {

        super.onActivityResult(requestCode, resultCode, data);

        /*

receive latLong picked from map

*/

switch (requestCode){


        case (HOME_ADDRESS_PICKER):

            if(resultCode == RESULT_OK){


                // set the home LatLng

                homeLatLng = data.getStringExtra("latitude-longitude");

                Log.d(LogTags.Map_TAG, "onActivityResult: home latLng
fetched = "+homeLatLng);


                // start address fetch intent service

                String[] latLng = homeLatLng.split(",");

                addressReceiver.startAddressFetchService(

                    this,

                    Double.valueOf(latLng[0]),
```

```java
                Double.valueOf(latLng[1]),

                0

        );


        //onSuccess

        homeAddress.setText(getText(R.string.address_fetching_text));


homeAddress.setCompoundDrawables(null,null,checkedIcon,null);


    }


    break;


case (WORK_ADDRESS_PICKER):
    if(resultCode == RESULT_OK){

        // set the work address

        workLatLng = data.getStringExtra("latitude-longitude");

        Log.d(LogTags.Map_TAG, "onActivityResult: work latLng
fetched = "+workLatLng);


        // start address fetch intent service

        String[] latLng = workLatLng.split(",");

        addressReceiver.startAddressFetchService(
```

```java
                    this,

                    Double.valueOf(latLng[0]),

                    Double.valueOf(latLng[1]),

                    1

            );


            //onSuccess

workAddress.setCompoundDrawables(null,null,checkedIcon,null);
            workAddress.setText(getText(R.string.address_fetching_text));
}
break;
 }
 private boolean RequiredEditText(EditText e)
  {
    if(e.getText().toString().length()==0)
    {
      e.setError("Required");
      return true;
    }
return false;
  }
  @Override
```

```java
    public void updateAddress(String address, int type) {

        /*

        address received callback

         */
 if(type == 0) {

        // home address
 homeAddressVariable = address;
homeAddress.setText(homeAddressVariable);

    }
        else if(type==1){

        // work address

        workAddressVariable = address;

        workAddress.setText(workAddressVariable);
}}}
```

VerificationPageActivity.java

```java
package com.example.covid_19alertapp.activities;

import androidx.annotation.NonNull;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Context;

import android.content.Intent;
```

```java
import android.content.SharedPreferences;

import android.os.Bundle;

import android.os.Handler;

import android.text.Editable;

import android.text.TextWatcher;

import android.view.View;

import android.view.inputmethod.InputMethodManager;

import android.widget.Button;

import android.widget.EditText;

import android.widget.TextView;

import android.widget.Toast;

import androidx.appcompat.widget.Toolbar;


import com.example.covid_19alertapp.R;

import com.example.covid_19alertapp.extras.Constants;

import com.example.covid_19alertapp.models.UserInfoData;

import com.google.android.gms.tasks.OnCompleteListener;

import com.google.android.gms.tasks.Task;

import com.google.firebase.auth.AuthResult;

import com.google.firebase.auth.FirebaseAuth;

import com.google.firebase.auth.FirebaseUser;

import com.google.firebase.auth.PhoneAuthCredential;

import com.google.firebase.auth.PhoneAuthProvider;
```

```java
import com.google.firebase.auth.UserInfo;

import com.google.firebase.database.DataSnapshot;

import com.google.firebase.database.DatabaseError;

import com.google.firebase.database.DatabaseReference;

import com.google.firebase.database.FirebaseDatabase;

import com.google.firebase.database.ValueEventListener;


import static com.example.covid_19alertapp.activities.SignUpActivity.verification;

public class VerificationPageActivity extends AppCompatActivity {

Toolbar toolbar;

    Button homeButton,confirmButton,editNumberButton;

    TextView textViewResendOTP;

    EditText digit1,digit2,digit3,digit4,digit5,digit6;

    String verificationCode,uid;

    FirebaseAuth auth;

    SharedPreferences sp,userInfoCheck,signUpSp;

    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_verification_page);

 homeButton = findViewById(R.id.home_button_verification_page);

        toolbar = findViewById(R.id.verification_page_toolbar);
```

```java
        digit1=findViewById(R.id.editTextDigit1);

    digit2=findViewById(R.id.editTextDigit2);

    digit3=findViewById(R.id.editTextDigit3);

    digit4=findViewById(R.id.editTextDigit4);

    digit5=findViewById(R.id.editTextDigit5);

    digit6=findViewById(R.id.editTextDigit6);

    auth=FirebaseAuth.getInstance();

    setSupportActionBar(toolbar);

    sp = getSharedPreferences("verify",MODE_PRIVATE);
     userInfoCheck=getSharedPreferences("info",MODE_PRIVATE);
     signUpSp                                                      =
getSharedPreferences(Constants.USER_LOGIN_INFO_SHARED_PREFE
RENCES,MODE_PRIVATE);

if(sp.getBoolean("logged",false)){

if(userInfoCheck.getBoolean(Constants.user_exists_preference,false)) {

        GoToMainActivity();

        finish();

      else

 checkIfUserInfoExist();

 }

homeButton.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View v) {

            SignUpActivity.ISRETURNEDFROMVERLAYOUT = true;
```

```java
startActivity(newIntent(getApplicationContext(),SignUpActivity.class)

finish();

            }

        });
((EditText)findViewById(R.id.editTextDigit1)).setCursorVisible(false);
        findViewById(R.id.editTextDigit1).setOnClickListener(new
View.OnClickListener() {

        @Override

        public void onClick(View v) {

            ((EditText)
findViewById(R.id.editTextDigit1)).setCursorVisible(true); }});



((EditText)findViewById(R.id.editTextDigit1)).addTextChangedListener(n
ew TextWatcher() {

        @Override

 {

  findViewById(R.id.editTextDigit2).clearFocus();

  findViewById(R.id.editTextDigit2).requestFocus();

            ((EditText)
findViewById(R.id.editTextDigit2)).setCursorVisible(true);

        }

        }

        @Override

        public void afterTextChanged(Editable s) { }

    });
```

```java
((EditText)findViewById(R.id.editTextDigit2)).addTextChangedListener(new TextWatcher() {

        @Override

        public void beforeTextChanged(CharSequence s, int start, int count, int after) { }

        @Override

        public void onTextChanged(CharSequence s, int start, int before, int count) {


if(((EditText)findViewById(R.id.editTextDigit2)).getText().toString().length()==1)

            {

                findViewById(R.id.editTextDigit3).clearFocus();
                findViewById(R.id.editTextDigit3).requestFocus();
                ((EditText)
findViewById(R.id.editTextDigit3)).setCursorVisible(true);

            }

        }

        @Override

        public void afterTextChanged(Editable s) { }

    });


((EditText)findViewById(R.id.editTextDigit3)).addTextChangedListener(new TextWatcher() {

        @Override
```

```java
        public void beforeTextChanged(CharSequence s, int start, int count,
int after) { }

        @Override

        public void onTextChanged(CharSequence s, int start, int before, int
count) {


if(((EditText)findViewById(R.id.editTextDigit3)).getText().toString().length()==1)

            {

                findViewById(R.id.editTextDigit4).clearFocus();
                findViewById(R.id.editTextDigit4).requestFocus();
                ((EditText)
findViewById(R.id.editTextDigit4)).setCursorVisible(true);

            }

        }

        @Override

        public void afterTextChanged(Editable s) { }

    });


((EditText)findViewById(R.id.editTextDigit4)).addTextChangedListener(new TextWatcher() {

        @Override

        public void beforeTextChanged(CharSequence s, int start, int count,
int after) { }

        @Override
```

```java
        public void onTextChanged(CharSequence s, int start, int before, int count) {

if(((EditText)findViewById(R.id.editTextDigit4)).getText().toString().length()==1)

        {

            findViewById(R.id.editTextDigit5).clearFocus();
            findViewById(R.id.editTextDigit5).requestFocus();
            ((EditText)
findViewById(R.id.editTextDigit5)).setCursorVisible(true);

        }

    }

    @Override

    public void afterTextChanged(Editable s) { }

});

((EditText)findViewById(R.id.editTextDigit5)).addTextChangedListener(new TextWatcher() {

    @Override

    public void beforeTextChanged(CharSequence s, int start, int count, int after) { }

    @Override

    public void onTextChanged(CharSequence s, int start, int before, int count) {
```

```
if(((EditText)findViewById(R.id.editTextDigit5)).getText().toString().length()==1)

        {

            findViewById(R.id.editTextDigit6).clearFocus();
            findViewById(R.id.editTextDigit6).requestFocus();
            ((EditText)
findViewById(R.id.editTextDigit6)).setCursorVisible(true);

        }

    }

    @Override

    public void afterTextChanged(Editable s) { }

});


((EditText)findViewById(R.id.editTextDigit6)).addTextChangedListener(new TextWatcher() {

    @Override

    public void beforeTextChanged(CharSequence s, int start, int count, int after) { }

    @Override

    public void onTextChanged(CharSequence s, int start, int before, int count) {


if(((EditText)findViewById(R.id.editTextDigit6)).getText().toString().length()==1)

        {
```

```java
        ((EditText)
findViewById(R.id.editTextDigit6)).setCursorVisible(false);

        findViewById(R.id.btn_continue).clearFocus();

        findViewById(R.id.btn_continue).requestFocus();

        hideSoftInput();

    }

  }

  @Override

  public void afterTextChanged(Editable s) { }

});
textViewResendOTP = findViewById(R.id.TextViewResendOTP);
    textViewResendOTP.setOnClickListener(new View.OnClickListener()
{

@Overr

public void onClick(View v) {

        Toast.makeText(getApplicationContext(),"RESENDING
OTP",Toast.LENGTH_SHORT).show();

        textViewResendOTP.setEnabled(false);

textViewResendOTP.setTextColor(getResources().getColor(R.color.colorIn
active));

                                ToggleResendTextView(textViewResend
                                OTP);

                                //Write ResendOTP Function Here
}

                        });
```

```java
ToggleResendTextView(textViewResendOTP);

confirmButton = findViewById(R.id.btn_continue);

editNumberButton = findViewById(R.id.btn_change_number);

confirmButton.setOnClickListener(new View.OnClickListener() {

    @Override

    public void onClick(View v) {

        //Write OTP Submission Function Here


verificationCode=digit1.getText().toString().trim()+""+digit2.getText().toS
tring().trim()+""+digit3.getText().toString().trim()+""+digit4.getText().toS
tring().trim()+""+digit5.getText().toString().trim()+""+digit6.getText().toS
tring().trim();

        System.out.println(verificationCode+"                          sdf"+
digit1.getText().toString());

        verify(verificationCode);





    }
});



editNumberButton.setOnClickListener(new View.OnClickListener() {

    @Override

    public void onClick(View v) {
```

```java
        startActivity(new
Intent(getApplicationContext(),SignUpActivity.class));

        SignUpActivity.ISRETURNEDFROMVERLAYOUT = true;


signUpSp.edit().putBoolean(Constants.user_login_state_shared_preference
,false).apply();

        finish();



    }

  });



  }



  //Methods

  public void hideSoftInput() {

    View view1 = this.getCurrentFocus();

    if(view1!= null){

      InputMethodManager      imm     =
(InputMethodManager)
getSystemService(Context.INPUT_METHOD_SERVICE);

      imm.hideSoftInputFromWindow(view1.getWindowToken(), 0);

    }

  }

  public void ToggleResendTextView(final TextView textView)

  {
```

```java
        final Handler handler = new Handler();

        handler.postDelayed(new Runnable() {

            @Override

            public void run() {

                textView.setEnabled(true);

textView.setTextColor(getResources().getColor(R.color.colorActive));

            }

        }, 20000);

    }



    public void verify(String verificationCode){

        System.out.println(verification+" verify");

        verfyPhoneNumber(verification,verificationCode);

    }


    private void verfyPhoneNumber(String verification, String enterededCodeString) {

        System.out.println(verification+" credential "+enterededCodeString);

        PhoneAuthCredential phoneAuthCredential= PhoneAuthProvider.getCredential(verification,enterededCodeString);

        signInWithPhoneAuthCredential(phoneAuthCredential);

    }
```

```java
    private void signInWithPhoneAuthCredential(PhoneAuthCredential credential) {

        auth.signInWithCredential(credential)

            .addOnCompleteListener(this,
new OnCompleteListener<AuthResult>() {

                @Override

                public void onComplete(@NonNull Task<AuthResult> task) {

                    if (task.isSuccessful()) {

                        // Sign in success, update UI with the signed-in user's
information
                                            //Log.d(TAG,
                                            "signInWithCredential:success");

                                            //System.out.println("Successful");
                                            FirebaseUser user
                                            =
                                            task.getResult().get
                                            User(); uid=
FirebaseAuth.getInstance().getCurrentUser().getUid();


if(userInfoCheck.getBoolean(Constants.user_exists_preference,false)) {

                            GoToMainActivity();

                            finish();

                        }

                        else

                            checkIfUserInfoExist();


                        sp.edit().putBoolean("logged",true).apply();
```

```java
                Toast.makeText(getApplicationContext(),"User Signed In
Successfully",Toast.LENGTH_SHORT).show();


                                                } else {

                                                    //System.out.println(task.getException(
                                                    )+"

                                                    task


                                                    Toast.makeText(getApplicationContext
                                                    (),"Please

                                                    use

                                                    the
valid code",Toast.LENGTH_SHORT).show();

                    // Sign in failed, display a message and update the UI
exception");




                }
            }
        });
    }


    public void checkIfUserInfoExist(){


        FirebaseDatabase database = FirebaseDatabase.getInstance();


        uid=FirebaseAuth.getInstance().getUid();
```

```java
DatabaseReference ref
= database.getReference().child("UserInfo").child(uid);
```

```java
ValueEventListener valueEventListener = new ValueEventListener() {

    @Override
    public void onDataChange(DataSnapshot dataSnapshot) {
        if(dataSnapshot.exists()){

            UserInfoData                    user
= dataSnapshot.getValue(UserInfoData.class);



userInfoCheck.edit().putString(Constants.username_preference,
user.getName()).apply();


userInfoCheck.edit().putString(Constants.user_dob_preference,
user.getDob()).apply();



userInfoCheck.edit().putString(Constants.user_home_address_preference,
user.getHomeAddress()).apply();



userInfoCheck.edit().putString(Constants.user_home_address_latlng_pref
e rence, user.getHomeLatLng()).apply();

userInfoCheck.edit().putString(Constants.uid_preference,uid).apply();
```

```
userInfoCheck.edit().putString(Constants.user_phone_no_preference,
user.getContactNumber()).apply();

userInfoCheck.edit().putBoolean(Constants.user_exists_preference,true).apply();

if(String.valueOf(dataSnapshot.child(Constants.userInfo_node_workAddress).getValue())!=null) {


userInfoCheck.edit().putString(Constants.user_work_address_preference,
user.getWorkAddress()).apply();


userInfoCheck.edit().putString(Constants.user_work_address_latlng_prefe rence, user.getWorkLatLng()).apply();

            }


        GoToMainActivity();
    }
    else {

        GotoUserInfoFormActivity();
    }finish();
}


@Override
```

```java
        public void onCancelled(@NonNull DatabaseError databaseError)
{

 }

 };
    ref.addListenerForSingleValueEvent(valueEventListener);

 }
public void GoToMainActivity(){


  startActivity(newIntent(getApplicationContext(), MenuActivity.class));

  }

  public void GotoUserInfoFormActivity(){


    startActivity(nIntent(getApplicationContext(),
UserInfoFormActivity.class));

  }
}
```

MenuActivity.java

```java
package com.example.covid_19alertapp.activities;


import androidx.annotation.Nullable;

import androidx.appcompat.app.AlertDialog;

import androidx.appcompat.app.AppCompatActivity;

import androidx.lifecycle.Observer;
```

```java
import androidx.work.Constraints;

import androidx.work.PeriodicWorkRequest;

import androidx.work.WorkInfo;

import androidx.work.WorkManager;


import android.content.DialogInterface;

import android.content.Intent;

import android.os.Bundle;

import android.util.Log;

import android.view.View;

import android.widget.Button;


import com.example.covid_19alertapp.R;

import com.example.covid_19alertapp.extras.Constants;

import com.example.covid_19alertapp.extras.LogTags;

import com.example.covid_19alertapp.services.BackgroundWorker;

import com.example.covid_19alertapp.sharedPreferences.MiscSharedPreferences;


import java.util.List;

import java.util.concurrent.TimeUnit;
```

```java
public class MenuActivity extends AppCompatActivity {

    /*

    starter activity to test and get the permissions + all time running start
    worker

    overwrite or edit this later, keeping the permission codes

     */


    Button home_btn;

    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_main);


        home_btn = findViewById(R.id.home_button_menu);

        home_btn.setOnClickListener(new View.OnClickListener() {

            @Override

            public void onClick(View v) {

                finish();

            }

        });

        // start background worker for always

        startWorker()

    }
```

```java
private void startWorker() {

if(!MiscSharedPreferences.getBgWorkerStatus(this)){

Constraints constraints = new Constraints.Builder()

        .setRequiresBatteryNotLow(true)

        .setRequiresCharging(false)

        .build();
PeriodicWorkRequest promptNotificationWork =
        NewPeriodicWorkRequest.Builder(BackgroundWorker.class,
30, TimeUnit.MINUTES)

            .setConstraints(constraints)

            .addTag(Constants.background_WorkerTag)

            .build();

WorkManager.getInstance(getApplicationContext()).getWorkInfoByIdLiveData(promptNotificationWork.getId())

        .observe(this, new Observer<WorkInfo>() {

          @Override

 public void onChanged(@Nullable WorkInfo workInfo) {

            if (workInfo != null && workInfo.getState()
== WorkInfo.State.ENQUEUED) {

                Log.d(LogTags.Worker_TAG, "onChanged: worker is
enqueued");

 // set shared preference true

MiscSharedPreferences.setBgWorkerStatus(MenuActivity.this, true);

            }
```

```java
if (workInfo != null && workInfo.getState()
== WorkInfo.State.CANCELLED) {

                Log.d(LogTags.Worker_TAG, "onChanged: worker
was stopped. why?");


                // set shared preference false

MiscSharedPreferences.setBgWorkerStatus(MenuActivity.this, false);
                }
            }
        });
    WorkManager.getInstance(getApplicationContext())
            .enqueue(promptNotificationWork);
    } }
public void uploadClick(View view) {
if(!MiscSharedPreferences.getUploadStatus(this)) {
 Intent intent = new Intent(this, UploadLocationsActivity.class);
        startActivity(intent);
}
    else{
// show dialog and prevent
AlertDialog.Builder builder = new AlertDialog.Builder(this);
builder.setMessage(getText(R.string.cant_upload_twice_message))
            .setCancelable(false)
```

```java
.setPositiveButton(getText(R.string.permissions_dialogbox_positive),
new DialogInterface.OnClickListener() {

        @Override

        public void onClick(DialogInterface dialog, int which) {

            dialog.dismiss();

        }

    })

    .setNegativeButton("Override",
new DialogInterface.OnClickListener() {

        @Override

        public void onClick(DialogInterface dialog, int which) {

            dialog.dismiss();


            // TODO: remove this

            Intent    intent    =    new    Intent(MenuActivity.this,
UploadLocationsActivity.class);

            startActivity(intent);

        }

    });


    AlertDialog alertDialog = builder.create();

    alertDialog.show();
```

```java
        }

    }


    public void startNewsFeed(View view)

    {

        startActivity(new
Intent(getApplicationContext(),NewsFeedActivity.class));

    }


    public void openSettingsClick(View view) {


        Intent intent = new Intent(this, TrackerSettingsActivity.class);

        startActivity(intent);


    }


    public void showMatchedLocationsClick(View view) {


        Intent     intent     =     new      Intent(getApplicationContext(),
ShowMatchedLocationsActivity.class);

        startActivity(intent); }

public void startMyLocationsMap(View view) {

startActivity( new Intent(this, MyLocationsMapsActivity.class) );

    }
```

}

UploadLocationsActivity.java

```java
package com.example.covid_19alertapp.activities;


import androidx.annotation.NonNull;

import androidx.appcompat.app.AlertDialog;

import androidx.appcompat.app.AppCompatActivity;

import androidx.lifecycle.MutableLiveData;

import androidx.lifecycle.Observer;


import android.content.DialogInterface;

import android.os.Bundle;

import android.util.Log;

import android.view.View;

import android.widget.Button;

import android.widget.ProgressBar;

import android.widget.TextView;

import android.widget.Toast;


import com.example.covid_19alertapp.R;

import com.example.covid_19alertapp.extras.Constants;

import com.example.covid_19alertapp.extras.LogTags;
```

```java
import com.example.covid_19alertapp.models.InfectedLocations;

import com.example.covid_19alertapp.roomdatabase.LocalDBContainer;

import com.example.covid_19alertapp.roomdatabase.VisitedLocations;

import com.example.covid_19alertapp.roomdatabase.VisitedLocationsDao;

import com.example.covid_19alertapp.roomdatabase.VisitedLocationsDatabase;

import com.example.covid_19alertapp.sharedPreferences.MiscSharedPreferences;

import com.example.covid_19alertapp.sharedPreferences.UserInfoSharedPreferences;

import com.google.firebase.database.DataSnapshot;

import com.google.firebase.database.DatabaseError;

import com.google.firebase.database.DatabaseException;

import com.google.firebase.database.DatabaseReference;

import com.google.firebase.database.FirebaseDatabase;

import com.google.firebase.database.ValueEventListener;


import java.util.ArrayList;

import java.util.Calendar;

import java.util.List;


public class UploadLocationsActivity extends AppCompatActivity {
/*
```

upload locations from local db to firebase

implement verification by medical report photo here

 */

 // firebase

```java
   //private FirebaseDatabase firebaseDatabase;

   private DatabaseReference firbaseReference;


   // local db

   private VisitedLocationsDatabase roomDatabase;

   private VisitedLocationsDao visitedLocationsDao;


   // retrieved data from local db

   private List<VisitedLocations> retrievedDatas = new ArrayList<>();


   // retrieve and upload progress level

   private int dataSize, dataCount = 0;

   private double currProgress = 0;


   // models to store in firebase

   private MutableLiveData<InfectedLocations> currentInfectedLocation =
new MutableLiveData<>();

   final    Observer<InfectedLocations>    newEntryObserver    =
new Observer<InfectedLocations>() {

      @Override
```

```java
public void onChanged(final InfectedLocations infectedLocations) {

    if(!infectedLocations.allFieldsSet()) {
        // exit if all values not set
        Log.d(LogTags.Upload_TAG, "onChanged: all fields not set");
        return;
    }


    // upload to firebase
    insertToFirebase("infectedLocations",    infectedLocations.getKey(),
infectedLocations.getDateTime(), infectedLocations.getCount());


    // blacklist user


    // get user uid
    String                         uid                         =
UserInfoSharedPreferences.getUid(UploadLocationsActivity.this);

    insertToFirebase("blackList/"+uid+"/visitedLocations",
            infectedLocations.getKey(),    infectedLocations.getDateTime(),
infectedLocations.getCount());


    }
};
```

```java
// UI stuff

ProgressBar uploadProgressBar;

TextView uploadProgressText;

Button uploadButton, home_btn;


// back press during uploading

boolean uploading = false;


@Override
protected void onCreate(Bundle savedInstanceState) {

    super.onCreate(savedInstanceState);

    setContentView(R.layout.activity_upload_locations);

    home_btn = findViewById(R.id.home_button_upload_locations);

    home_btn.setOnClickListener(new View.OnClickListener() {

        @Override
        public void onClick(View v) {

            finish();

        }

    });


    setUpUI();
```

```java
// set firebase database offline capability, set firebase reference

if(firbaseReference == null) {

    FirebaseDatabase database = FirebaseDatabase.getInstance();

    try {

        database.setPersistenceEnabled(true);

    }catch (DatabaseException e){

        Log.d(LogTags.Upload_TAG,    "onCreate:  setPersistent  issue. need to fix this");

    }

    firbaseReference = database.getReference();

}


// set local db configs

roomDatabase                                              = VisitedLocationsDatabase.getDatabase(getApplicationContext());

visitedLocationsDao = roomDatabase.visitedLocationsDao();


// set InfectedLocation Live Data observer

currentInfectedLocation.observe(this, newEntryObserver);


}


@Override
```

```java
    public void onBackPressed() {


        if(uploading) {


            // show dialog

            Log.d(LogTags.Upload_TAG,    "onBackPressed:    back    pressed
during uploading");




            AlertDialog.Builder builder = new AlertDialog.Builder(this);



            builder.setMessage(getText(R.string.backPressed_during_upload))

                .setCancelable(false)

.setPositiveButton(getText(R.string.backPressed_during_upload_positive),
new DialogInterface.OnClickListener() {

                    @Override

                    public void onClick(DialogInterface dialog, int which) {

                        dialog.dismiss();

                        Log.d(LogTags.Upload_TAG,        "onClick:        uploading
resumes");
                                                    }

                                                    }
                                                    )
                                                    ;
```

```java
        AlertDialog alertDialog = builder.create();

        alertDialog.show();


    }
    else

        super.onBackPressed();


}


private void setUpUI() {


    uploadProgressBar = findViewById(R.id.uploadProgressBar);

    uploadProgressText = findViewById(R.id.uploadProgressText);

    uploadButton = findViewById(R.id.upload_btn);


}


private void uploadAndDeleteLocal() {
    /*

    retrive from local database,

    upload to firebase,

    delete from local databse
```

```java
   */

// save the uploading state

uploading = true;

uploadProgressText.setVisibility(View.VISIBLE);

uploadProgressBar.setVisibility(View.VISIBLE);


roomDatabase.databaseWriteExecutor.execute(new Runnable() {
    @Override
    public void run() {


        // fetch all from localDB

        retrievedDatas = visitedLocationsDao.fetchAll();

        Log.d(LogTags.Upload_TAG,      "onCreate:      local
database retrieved");


        // retrieval from localDB done (50%)

        currProgress = 50;

        dataSize = retrievedDatas.size();



        if(dataSize==0) {

            // notify on UI thread no data found locally
```

```java
runOnUiThread(new Runnable() {

    @Override

    public void run() {

        Toast.makeText(UploadLocationsActivity.this,
"No locations recorded, only home address uploaded",
Toast.LENGTH_LONG)

            .show();

        uploadProgressText.setVisibility(View.GONE);

        uploadProgressBar.setVisibility(View.GONE);

    }

});


    uploading = false;


    return;

}



for(VisitedLocations roomEntry: retrievedDatas){


    // splitData[0] = lat,lon

    // splitData[1] = dateTime

    String[] splitData = roomEntry.splitPrimaryKey();
```

```java
            Log.d(LogTags.Upload_TAG, "run: current retrieved data = "
                +splitData[0]+",                     "+roomEntry.getCount()+",
"+splitData[1]);


            // set the LiveData object
            currentInfectedLocation.postValue(new
InfectedLocations(splitData[0], roomEntry.getCount(), splitData[1]));



            // delete current entry from local database
            visitedLocationsDao.deleteLocation(roomEntry);
            Log.d(LogTags.Upload_TAG, "onCreate: deleting room entry
= "

                +roomEntry.getConatainerDateTimeComposite());



            // keep track of upload progress (50%-100%)

            currProgress += (double) 50/dataSize;

            uploadProgressBar.setProgress((int) currProgress);



            dataCount++;

            if(dataCount==dataSize){


               runOnUiThread(new Runnable() {

                 @Override

                 public void run() {
```

```
                // remove progressbar

uploadProgressText.setText(getText(R.string.uploadFinished_progressbar
_text));

                uploadProgressBar.setVisibility(View.GONE);

            }

        });


        // uploading done

        uploading = false;


        // set upload status shared preference true

MiscSharedPreferences.setUploadStatus(UploadLocationsActivity.this,
true);


        }


        // sleep, give time to upload properly?
        try {

            Thread.sleep(100);

        } catch (InterruptedException e) {

            Log.d(LogTags.Upload_TAG, "run: thread just had coffee
and isn't tired rn");

            e.printStackTrace();
```

```java
            }

        }

    }

});


}


private void uploadHomeLocation(){


    List<String> entries;


    String                          homeLatLng                          =
UserInfoSharedPreferences.getHomeLatLng(this);

    if(homeLatLng.equals("")){

        Log.d(LogTags.Upload_TAG, "uploadHomeLocation: why the hell
is home null");

        return;

    }


    String[] latLng = homeLatLng.split(",");
```

```java
        entries                                                      =
LocalDBContainer.calculateContainer(Double.parseDouble(latLng[0]),
Double.parseDouble(latLng[1]), "Bangladesh");


    // get current time

    Calendar cal = Calendar.getInstance();

    //TODO: add year

    final String dateTime = (cal.get(Calendar.MONTH)+1)  +"-"  //
Calender.MONTH is 0 based -_- why tf?

        + cal.get(Calendar.DATE) +"-"

        + cal.get(Calendar.HOUR_OF_DAY);


    for (String entry: entries) {


       // need '@' instead of '.'

       entry = entry.replaceAll("\\.","@");


       // upload home address

       insertToFirebase("infectedHomes", entry, dateTime, 1);


       // blacklist user


       // get user uid

       String uid = UserInfoSharedPreferences.getUid(this);
```

```java
            insertToFirebase("blackList/"+uid+"/home", entry, dateTime, 1);


        }


    }


    private void insertToFirebase(final String node, String latLon, String dateTime,
    final long count){


        final            DatabaseReference            currentReference
= firbaseReference.child(node).child(latLon).child(dateTime);


        currentReference.addListenerForSingleValueEvent(new
ValueEventListener() {
            @Override
            public void onDataChange(@NonNull DataSnapshot dataSnapshot)
{



                if(dataSnapshot.child("unverifiedCount").getValue()!=null){
                    // data already exists
                    Log.d(LogTags.Upload_TAG,        "onDataChange:
location already exists at "+node);
```

```java
                long existingCount =
(long)dataSnapshot.child("unverifiedCount").getValue();

        currentReference.child("unverifiedCount").setValue(count
+ existingCount);


    }


                        else{

                            // no such data exists

                            Log.d(LogTags.Upload_TAG,
                            "onDataChange: new location at
"+node);



        currentReference.child("unverifiedCount").setValue(count);

    }


    if(dataSnapshot.child("verifiedCount").getValue()==null)

        currentReference.child("verifiedCount").setValue(0);



    }



    @Override

    public void onCancelled(@NonNull DatabaseError databaseError)
{
```

```java
            Log.d(LogTags.Upload_TAG, "onCancelled: firebase e somossa ki korbo?
"+databaseError.getMessage() +", "+databaseError.getDetails());

            Toast.makeText(getApplicationContext(),

                getApplicationContext().getString(R.string.no_internet_toast),

                        Toast.LENGTH_LONG)

                        .show();


            }

        });


    }



    public void uploadClicked(View view) {

        /*

        upload button click

         */



        // show dialog before uploading



        AlertDialog.Builder builder = new AlertDialog.Builder(this);



        builder.setTitle(getText(R.string.upload_confirmation_title))
```

```java
                .setMessage(getText(R.string.upload_confirmation_message))

                .setCancelable(false)


.setPositiveButton(getText(R.string.upload_confirmation_positive),
new DialogInterface.OnClickListener() {

                @Override

                public void onClick(DialogInterface dialog, int which) {

                    dialog.dismiss();


                    Log.d(LogTags.Upload_TAG, "onClick: uploading starts");


                    // upload home location

                    uploadHomeLocation();


                    // start uploading process

                    uploadButton.setEnabled(false);

                    uploadAndDeleteLocal();


                }
        })


.setNegativeButton(getText(R.string.upload_confirmation_negative),
new DialogInterface.OnClickListener() {
```

```java
        @Override

        public void onClick(DialogInterface dialog, int which) {

            dialog.dismiss();


                                                // close the activity

                                                UploadLocationsActivity.th

                                                is.finish();

                                    }       Log.d(LogTags.Upload_TAG, "onClick:
                                                not gonna upload");
                            });



    AlertDialog alertDialog = builder.create();

    alertDialog.show();



    }
}
```

ShowMatchedLocationsActivity.java

```java
package com.example.covid_19alertapp.activities;


import androidx.annotation.NonNull;

import androidx.appcompat.app.AppCompatActivity;

import androidx.recyclerview.widget.LinearLayoutManager;

import androidx.recyclerview.widget.RecyclerView;
```

```java
import android.os.Bundle;

import android.os.Handler;

import android.util.Log;

import android.view.View;

import android.widget.Button;

import android.widget.ProgressBar;

import android.widget.TextView;

import android.widget.Toast;


import com.example.covid_19alertapp.R;

import com.example.covid_19alertapp.adapters.LocationListAdapter;

import com.example.covid_19alertapp.extras.AddressReceiver;

import com.example.covid_19alertapp.extras.Constants;

import com.example.covid_19alertapp.extras.Internet;

import com.example.covid_19alertapp.extras.LogTags;

import com.example.covid_19alertapp.extras.Notifications;

import com.example.covid_19alertapp.models.MatchedLocation;

import com.example.covid_19alertapp.roomdatabase.LocalDBContainer;

import com.example.covid_19alertapp.roomdatabase.VisitedLocations;

import com.example.covid_19alertapp.roomdatabase.VisitedLocationsDao;

import com.example.covid_19alertapp.roomdatabase.VisitedLocationsDatabase;
```

```java
import
com.example.covid_19alertapp.sharedPreferences.UserInfoSharedPreferen
ces;

import com.google.firebase.database.DataSnapshot;

import com.google.firebase.database.DatabaseError;

import com.google.firebase.database.DatabaseReference;

import com.google.firebase.database.FirebaseDatabase;

import com.google.firebase.database.ValueEventListener;


import java.util.ArrayList;

import java.util.List;


public class ShowMatchedLocationsActivity extends AppCompatActivity
implements AddressReceiver.AddressView {


    // matched locations model (for recycler-view)

    ArrayList<MatchedLocation> matchedLocations = new ArrayList<>();

    int matchedLocationPosition = 0, locationQueryCount = 0;


    // matched home locations model (for another(?) recycler-view)
    ArrayList<MatchedLocation>      matchedHomeLocations      =
    new
ArrayList<>();

    int homeQueryCount = 0;
```

```java
    // firebase
    private DatabaseReference firebaseReference;


    // local db
    private VisitedLocationsDatabase roomDatabase;

    private VisitedLocationsDao visitedLocationsDao;


    // retrieved data from local db
    private List<VisitedLocations> retrievedDatas = new ArrayList<>();

    private int dataSize;


    // Address Fetch
    AddressReceiver addressReceiver = new AddressReceiver(new Handler(), this);


    // UI stuff
    private ProgressBar progressBar;

    private TextView progressBarText;

    private Button retryButton;

    private RecyclerView locationRecyclerView, homeLocationRecyclerView;

    private LocationListAdapter locationListAdapter, homeLocationListAdapter;

    private boolean internetAvailable = true;
```

```java
// flags
private boolean localDbEmptyFlag = false;

private boolean homeLocationsFetchFinishedFlag = false;

private boolean locationsFetchFinishedFlag = false;


@Override
protected void onCreate(Bundle savedInstanceState) {

    super.onCreate(savedInstanceState);

    setContentView(R.layout.activity_show_matched_locations);


    setUI();


    Notifications.removeNotification(Constants.DangerNotification_ID,
this);


    // set local db configs
    roomDatabase                                                    =
VisitedLocationsDatabase.getDatabase(getApplicationContext());

    visitedLocationsDao = roomDatabase.visitedLocationsDao();


    // firebase
    firebaseReference = FirebaseDatabase.getInstance().getReference();
```

```java
        findHomeMatchedLocations();

        findMatchedLocations();


    }


    private void setUI() {


        progressBar = findViewById(R.id.progressBar);

        progressBarText = findViewById(R.id.progressText);

        retryButton = findViewById(R.id.retry_btn);


        homeLocationRecyclerView                                    =
findViewById(R.id.homeRecyclerView);

        homeLocationRecyclerView.setLayoutManager(new
LinearLayoutManager(this));


        locationRecyclerView = findViewById(R.id.locationRecyclerView);
        locationRecyclerView.setLayoutManager(new
LinearLayoutManager(this));


    }


    private void findHomeMatchedLocations() {
```

```java
homeLocationsFetchFinishedFlag = false;

matchedHomeLocations.clear();

homeQueryCount = 0;

homeLocationListAdapter = new LocationListAdapter(this,
matchedHomeLocations);

homeLocationRecyclerView.setAdapter(homeLocationListAdapter);


List<String> queryKeys;


final String homeLatLng
= UserInfoSharedPreferences.getHomeLatLng(this);
if(homeLatLng.equals("")){

Log.d(LogTags.Worker_TAG, "queryHomeAddress: why the hell is
home null");

return;
}


final String[] latLng = homeLatLng.split(",");


queryKeys =

LocalDBContainer.calculateContainer(Double.parseDouble(latLng[0]),
Double.parseDouble(latLng[1]), "Bangladesh");
```

```java
final int querySize = queryKeys.size();


for (String query: queryKeys) {


    if(!Internet.isInternetAvailable(getApplicationContext())){
        runOnUiThread(new Runnable() {
            @Override

            public void run() {


                internetDisconncetedUI();


            }
        });
        return;
    }


    // need '@' instead of '.'

    query = query.replaceAll("\\.","@");


    firebaseReference.child("infectedHomes").child(query)
        .addListenerForSingleValueEvent(new ValueEventListener() {
            @Override
```

```java
public void onDataChange(@NonNull DataSnapshot dataSnapshot) {

    if(dataSnapshot.getValue()!=null){

        long verifiedCount = 0, unverifiedCount = 0;
        for (DataSnapshot snapshot: dataSnapshot.getChildren()) {


verifiedCount+=(long)snapshot.child("verifiedCount").getValue();
            unverifiedCount+=(long)
snapshot.child("unverifiedCount").getValue();

        }


        MatchedLocation homeLocation = new
MatchedLocation(
                Double.pa
                rseDouble
                (latLng[0]
                ),
                Double.pa
                rseDouble
                (latLng[1]
                ), "NEAR
                YOUR
                HOME!",
```

```
verifiedCount, u
```

```
nverifiedCount
```

```
    );
```

```
if(matchedHomeLocations.isEmpty()) {
```

```java
                    // only find one match for home

                    matchedHomeLocations.add(homeLocation);

homeLocationListAdapter.notifyItemInserted(matchedHomeLocations.size
() - 1);

                    homeLocationsFetchFinishedFlag = true;

                    if(locationsFetchFinishedFlag)
                        dataFetchFinishedUI();
                    else if(localDbEmptyFlag)
                        localDbEmptyUI();
                }
                Log.d(LogTags.MatchFound_TAG,
"onDataChange: home location matched: "+homeLocation.toString());

            }


            homeQueryCount++;
            if(homeQueryCount>=querySize){
                homeLocationsFetchFinishedFlag = true;

                if(locationsFetchFinishedFlag)
```

```java
                    dataFetchFinishedUI();

                else if(localDbEmptyFlag)

                    localDbEmptyUI();

            }



        }



        @Override

        public void onCancelled(@NonNull DatabaseError
databaseError) {


            internetDisconncetedUI();


            Log.d(LogTags.MatchFound_TAG,    "onCancelled:
home location query failed "+databaseError.getMessage());


        }
    });


    }


}


    private void findMatchedLocations() {
```

```java
localDbEmptyFlag = false;

locationsFetchFinishedFlag = false;

matchedLocationPosition = 0;

locationQueryCount = 0;


if(internetAvailable) {

    retryButton.setVisibility(View.GONE);

    retryButton.setEnabled(false);

}

matchedLocations.clear();

locationListAdapter      =      new      LocationListAdapter(this,
matchedLocations);

locationRecyclerView.setAdapter(locationListAdapter);



roomDatabase.databaseWriteExecutor.execute(new Runnable() {

    @Override

    public void run() {



        // fetch from local db and query firebase

        retrievedDatas = visitedLocationsDao.fetchAll();
```

```java
dataSize = retrievedDatas.size();


if(dataSize==0){

    // local database empty


    localDbEmptyFlag = true;


    if(homeLocationsFetchFinishedFlag) {


        runOnUiThread(new Runnable() {

            @Override

            public void run() {

                localDbEmptyUI();

            }

        });

    }


    return;


}
```

```java
for (VisitedLocations currentEntry: retrievedDatas)
{
    // format = "latLon_dateTime"
    String[] splitter = currentEntry.splitPrimaryKey();


    // firebase query values
    final String key = currentEntry.getATencodedlatlon();
    final String dateTime = splitter[1];


    Log.d(LogTags.MatchFound_TAG, "run: query key = "+key
+" date time = "+dateTime);


    if(!Internet.isInternetAvailable(getApplicationContext())){

        runOnUiThread(new Runnable() {
            @Override
            public void run() {

                internetDisconncetedUI();


            }
        });
```

```java
            return;

        }


        // query in firebase

        firebaseReference                                                =
FirebaseDatabase.getInstance().getReference().child("infectedLocations").
child(key).child(dateTime);

        firebaseReference.addListenerForSingleValueEvent(new
ValueEventListener() {

            @Override

            public    void    onDataChange(@NonNull    DataSnapshot
dataSnapshot) {

                if(dataSnapshot.getValue()!=null){

                    // INFECTED LOCATION MATCH FOUND!


                    String latLon = key;

                    long          verifiedCount          =          (long)
dataSnapshot.child("verifiedCount").getValue();

                    long          unverifiedCount          =
(long) dataSnapshot.child("unverifiedCount").getValue();


                    MatchedLocation     matchedLocation     =
new MatchedLocation(latLon, dateTime, verifiedCount, unverifiedCount);

                    matchedLocations.add(matchedLocation);
```

```java
locationListAdapter.notifyItemInserted(matchedLocationPosition);

        // start address fetch service
        addressReceiver.startAddressFetchService(
            ShowMatchedLocationsActivity.this,
            matchedLocation.getBlLatitude(),
            matchedLocation.getBlLongitude(),
            matchedLocationPosition
        );

        matchedLocationPosition++;

    }

    locationQueryCount++;
    if(locationQueryCount>=dataSize){

        if(matchedLocations.isEmpty()){
            // no locations match

            locationsFetchFinishedFlag = true;
```

```java
if(matchedHomeLocations.isEmpty()) {

    // no home locations match either

    // show no match found


    runOnUiThread(new Runnable() {

        @Override

        public void run() {



            noMatchFoundUI();



        }

    });

}


else {

    // no location match

    // but home location matched show finish UI


    runOnUiThread(new Runnable() {

        @Override

        public void run() {



            dataFetchFinishedUI();
```

```java
                }

            });

        }

    }

}


        @Override

        public void onCancelled(@NonNull DatabaseError
databaseError) {

            // internet connection lost

            runOnUiThread(new Runnable() {

              @Override

              public void run() {

                internetDisconncetedUI();

              }
```

```java
            }); }

        }); } }

    });}
private void internetDisconncetedUI()

internetAvailable = false;

progressBar.setVisibility(View.INVISIBLE);

    //linearLayout.setVisibility(View.INVISIBLE);

  progressBarText.setText(getText(R.string.internet_disconnected_text));

    progressBarText.setVisibility(View.VISIBLE);

   retryButton.setEnabled(true);

   retryButton.setVisibility(View.VISIBLE);

   Log.d("removethis", "internetDisconncetedUI: visible");


    Toast.makeText(this,getText(R.string.no_internet_toast),
Toast.LENGTH_LONG)

        .show();


  }


  private void dataFetchFinishedUI(){


    retryButton.setEnabled(false);

    progressBarText.setVisibility(View.GONE);
```

```java
        progressBar.setVisibility(View.GONE);

        if(internetAvailable) {

            retryButton.setVisibility(View.GONE);

            retryButton.setEnabled(false);

        }

        Toast.makeText(this,      getText(R.string.finished_progressbar_text),
Toast.LENGTH_LONG)

            .show();


    }


    private void noMatchFoundUI(){


        progressBar.setVisibility(View.INVISIBLE);

        if(internetAvailable) {

            retryButton.setVisibility(View.GONE);

            retryButton.setEnabled(false);

        }

        progressBarText.setVisibility(View.VISIBLE);

        progressBarText.setText(getText(R.string.no_match_found_text));

    }


    private void localDbEmptyUI(){
```

```java
        progressBar.setVisibility(View.INVISIBLE);

        //linearLayout.setVisibility(View.INVISIBLE);

        if(internetAvailable) {

            retryButton.setVisibility(View.GONE);

            retryButton.setEnabled(false);

        }

        progressBarText.setVisibility(View.VISIBLE);

        progressBarText.setText(getText(R.string.local_db_empty_text));


    }


    public void retryClicked(View view) {


        internetAvailable = true;


        progressBar.setVisibility(View.VISIBLE);

        progressBarText.setVisibility(View.VISIBLE);

        progressBarText.setText(getText(R.string.loading_progressbar_text));


        findHomeMatchedLocations();

        findMatchedLocations();
```

```java
    }

    private int updateCount = 0;

    @Override

    public void updateAddress(String address, int listPosition) {

        /*

        address received here

         */


        matchedLocations.get(listPosition).setAddress(address);


        locationListAdapter.notifyItemChanged(listPosition);


        Log.d(LogTags.MatchFound_TAG, "updateAddress: address = "+matchedLocations.get(listPosition).toString());



        updateCount++;

        if(updateCount>=matchedLocations.size()){


            locationsFetchFinishedFlag = true;


            updateCount = 0;
```

```java
        if(homeLocationsFetchFinishedFlag)

            dataFetchFinishedUI();

    }

    }

}
```

TrackerSettingsActivity.java

```java
package com.example.covid_19alertapp.activities;


import androidx.annotation.NonNull;

import androidx.annotation.Nullable;

import androidx.appcompat.app.AppCompatActivity;

import androidx.appcompat.widget.Toolbar;


import android.Manifest;

import android.app.Activity;

import android.content.Intent;

import android.content.SharedPreferences;

import android.os.Build;

import android.os.Bundle;

import android.util.Log;

import android.view.View;

import android.widget.Button;
```

```java
import android.widget.Switch;

import android.widget.Toast;


import com.example.covid_19alertapp.R;

import com.example.covid_19alertapp.extras.Constants;

import com.example.covid_19alertapp.extras.LocationFetch;

import com.example.covid_19alertapp.extras.LogTags;

import com.example.covid_19alertapp.extras.Notifications;

import com.example.covid_19alertapp.extras.Permissions;

import com.example.covid_19alertapp.services.BackgroundLocationTracker;


public class TrackerSettingsActivity extends AppCompatActivity {
/*

settings (currently only contains location on/off)

 */


    Button home_btn;

    Switch notification_switch;

    private static boolean switch_status;


    // for location permission

    private Permissions permissions;
```

```java
private static final String[] permissionStrings = {

    Manifest.permission.ACCESS_FINE_LOCATION,

    Manifest.permission.ACCESS_BACKGROUND_LOCATION,

    Manifest.permission.ACCESS_WIFI_STATE

};


@Override
protected void onCreate(Bundle savedInstanceState) {

    super.onCreate(savedInstanceState);

    setContentView(R.layout.activity_tracker_settings);


    home_btn= findViewById(R.id.home_button_settings);


    //start notification channel(do this is MainActivity

    Notifications.createNotificationChannel(this);


    notification_switch = findViewById(R.id.notification_switch);


    home_btn.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View v) {

            finish();

        }
```

```java
        });


        notification_switch.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {


                save_preferences(notification_switch.isChecked());
                if(notification_switch.isChecked())
                {
                    try {


LocationFetch.checkDeviceLocationSettings(TrackerSettingsActivity.this);
                        if(LocationFetch.isLocationEnabled) {
                            // location is enabled
                            // start tracker service
                            Log.d(LogTags.Location_TAG, "onClick: location found
enabled");


                            // start BackgroundLocationTracker
                            startTrackerService();
                        }


                        else{
```

```java
                                          // location is not enabled

                                          Log.d(LogTags.Location_TAG,
                                          "onClick: location found
disabled");


                notification_switch.setChecked(false);

                Toast.makeText(getApplicationContext(),        "Turn
on location or press again please", Toast.LENGTH_LONG)

                    .show();

                save_preferences(false);

            }
        }catch (Exception e){


            // set switch off

            notification_switch.setChecked(false);


            // set shared preferences false

            save_preferences(false);


            // most probable reason for error is permission not granted

            promptPermissions();


            Log.d(LogTags.TrackerSettings_TAG,        "onClick:
error starting background location service! permission taken?");

        }
```

```java
            }

        else

        {

            try {
                // stop location tracker
                stopService(new
Intent(getApplicationContext(),BackgroundLocationTracker.class));

                                                }catch (Exception e){

                                                    Log.d(LogTags.TrackerSettings_TAG,

occured!");                                          "onClick:

                                                    error

                }

            }

        }

    });

    loadData();

    updateViews();

}


    private void startTrackerService(){


        if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.O) {

            startForegroundService(new
Intent(getApplicationContext(), BackgroundLocationTracker.class));
```

```
        Log.d(LogTags.TrackerSettings_TAG,    "onClick:    newer
version phones foreground service stared");

    } else

        startService(new                    Intent(getApplicationContext(),
BackgroundLocationTracker.class));


    }



    private void promptPermissions() {


        permissions    =    new    Permissions(this,    permissionStrings,
Constants.PERMISSION_CODE);


    if(!permissions.checkPermissions())

        permissions.askPermissions();


    }



    public void save_preferences(boolean state)

    {

        SharedPreferences sharedPreferences =


getSharedPreferences(Constants.LOCATION_SETTINGS_SHARED_PR
EFERENCES, MODE_PRIVATE);
```

```java
        SharedPreferences.Editor editor = sharedPreferences.edit();

        editor.putBoolean(Constants.location_tracker_state,state);

        editor.apply();

    }

    public void loadData()

    {

        SharedPreferences sharedPreferences =

getSharedPreferences(Constants.LOCATION_SETTINGS_SHARED_PREFERENCES, MODE_PRIVATE);

        switch_status                                                =
sharedPreferences.getBoolean(Constants.location_tracker_state,false);

        updateViews();

    }


    public void updateViews()

    {

        notification_switch.setChecked(switch_status);

    }


    @Override
    protected void onActivityResult(int requestCode, int resultCode, @Nullable Intent data){

        super.onActivityResult(requestCode, resultCode, data);
```

```java
switch (requestCode){

    case Constants.LOCATION_CHECK_CODE:

        // user input from the dialogbox showed after checkLocation()

        if(Activity.RESULT_OK == resultCode){

            // user picked yes

            Log.d(LogTags.Location_TAG, "onActivityResult: user picked
yes. starting background location tracker");

            startTrackerService();

            // save settings preferences
            save_preferences(true);
            // set LocationFetch boolean
            LocationFetch.isLocationEnabled = true;

            //set the settings switch UI to true
            notification_switch.setChecked(true);
        }

        else if(Activity.RESULT_CANCELED == resultCode){
```

```java
            // user picked no

            Log.d(LogTags.Location_TAG, "onActivityResult: user picked
no. setting boolean and preference to false");


            save_preferences(false);

            LocationFetch.isLocationEnabled = false;

        }


        break;


    }


  }


  @Override
  public void onRequestPermissionsResult(int requestCode, @NonNull
String[] permissions, @NonNull int[] grantResults) {

    //resolve unresolved permissions

switch (requestCode case Constants.PERMISSION_CODE:

try {

  this.permissions.resolvePermissions(permissions, grantResults);
        }catch (Exception e){
            Log.d(LogTags.Permissions_TAG,
"onRequestPermissionsResult: "+e.getMessage());
```

```
        }
    break;
}}}
```

AddressPickerMapsActivity.java

```java
package com.example.covid_19alertapp.activities;

import androidx.annotation.NonNull;

import androidx.fragment.app.FragmentActivity;


import android.content.Context;

import android.content.Intent;

import android.location.Location;

import android.location.LocationManager;

import android.net.wifi.WifiManager;

import android.os.Bundle;

import android.util.Log;

import android.view.View;

import android.widget.Button;

import android.widget.TextView;

import android.widget.Toast;


import com.example.covid_19alertapp.R;

import com.example.covid_19alertapp.extras.AddressReceiver;
```

```java
import  com.example.covid_19alertapp.extras.Internet;

import com.example.covid_19alertapp.extras.LogTags;

import com.google.android.gms.common.api.Status;

import com.google.android.gms.maps.CameraUpdateFactory;

import com.google.android.gms.maps.GoogleMap;

import
com.google.android.gms.maps.OnMapReadyCallback;

import  com.google.android.gms.maps.SupportMapFragment;

import com.google.android.gms.maps.model.LatLng;

import com.google.android.gms.maps.model.Marker;

import com.google.android.gms.maps.model.MarkerOptions;

import com.google.android.libraries.places.api.Places; import
com.google.android.libraries.places.api.model.Place;

import com.google.android.libraries.places.api.model.TypeFilter;

import com.google.android.libraries.places.api.net.PlacesClient;

import com.google.android.libraries.places.widget.AutocompleteFragment;

import
com.google.android.libraries.places.widget.AutocompleteSupportFragmen
t
;

import
com.google.android.libraries.places.widget.listener.PlaceSelectionListener;


import java.util.Arrays;
```

```java
public class AddressPickerMapsActivity extends FragmentActivity implements

    OnMapReadyCallback,

    GoogleMap.OnMyLocationButtonClickListener,

    GoogleMap.OnMyLocationClickListener,

    GoogleMap.OnMapLongClickListener {


    private GoogleMap mMap;

    private Button confirmButton;

    private Marker homeMarker = null;


    // home address location

    Location pickedLocation;


    // places api client

    PlacesClient placesClient;


    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_address_picker_maps);

        // Obtain the SupportMapFragment and get notified when the map is ready to be used.
```

```java
        SupportMapFragment mapFragment = (SupportMapFragment) getSupportFragmentManager()
                .findFragmentById(R.id.map);

        mapFragment.getMapAsync(this);


        if(!Internet.isInternetAvailable(this)) {

            // no internet, map not visible


            Toast.makeText(this, "No internet! Failed to load map.", Toast.LENGTH_LONG)
                    .show();


            TextView textView = findViewById(R.id.userHelperText);

            textView.setText(getString(R.string.map_no_internet_text));


        }


        initPlacesApi();


        confirmButton = findViewById(R.id.confirm_button);
    }


    private void initPlacesApi() {
```

```java
Places.initialize(getApplicationContext(),
getString(R.string.google_maps_key));

    placesClient = Places.createClient(this);



    // initialize fragment
    AutocompleteSupportFragment autocompleteFragment =
        (AutocompleteSupportFragment)
getSupportFragmentManager().findFragmentById(R.id.autocomplete_fragment);



    // specify place type (find out more)

    autocompleteFragment

        .setPlaceFields(Arrays.asList(Place.Field.NAME,
Place.Field.LAT_LNG))

        .setCountries("BD")

        .setTypeFilter(TypeFilter.GEOCODE);


    // place selection listener
    autocompleteFragment.setOnPlaceSelectedListener(new
PlaceSelectionListener() {

        @Override

        public void onPlaceSelected(@NonNull Place place) {


            // move camera to place
```

```java
        mMap.moveCamera(CameraUpdateFactory.newLatLngZoom(place.getLatLng(), 16.0f));


        Log.d(LogTags.Map_TAG, "onPlaceSelected: place selected = "+place.getName()+" "+place.getLatLng());


    }


        @Override

        public void onError(@NonNull Status status) {


        Toast.makeText(AddressPickerMapsActivity.this, "please try again", Toast.LENGTH_LONG)

                .show();


        Log.d(LogTags.Map_TAG, "onError: place selection error = "+status.toString());


        }

    });


    }
```

```java
@Override
public void onMapReady(GoogleMap googleMap) {

    mMap = googleMap;


    // Add a marker in Dhaka and move the camera
    LatLng dhaka = new LatLng(23.7805733, 90.2792376);
    mMap.moveCamera(CameraUpdateFactory.newLatLngZoom(dhaka,
10.0f));


    // check if all are needed
    mMap.setMyLocationEnabled(true);
    mMap.getUiSettings().setMyLocationButtonEnabled(true);
    mMap.setOnMyLocationClickListener(this);
    mMap.setOnMyLocationButtonClickListener(this);
    mMap.setOnMapLongClickListener(this);


    Log.d(LogTags.Map_TAG, "onMapReady: map ready");
}


@Override
public void onMapLongClick(LatLng latLng) {
    /*
```

```java
        location selected by long press on map

        ask user to confirm

         */Log.d(LogTags.Map_TAG,    "onMapLongClick:    marker    at    =
"+latLng.toString());

        pickedLocation = new Location(getLocalClassName());

        pickedLocation.setLatitude(latLng.latitude);

        pickedLocation.setLongitude(latLng.longitude);

        if(homeMarker!=null){

            homeMarker.remove();

        }
    homeMarker=mMap.addMarker(new
MarkerOptions().position(latLng).title("Home"));

    Toast.makeText(

            this,

            "press 'Confirm' to confirm or select another",

            Toast.LENGTH_LONG

        ).show();

        confirmButton.setEnabled(true);

    }
@Override

    public boolean onMyLocationButtonClick() {

        /*

        notify user if location and/or wifi is inactive

         */
```

```java
    String toastText = "";

    if(!wifiEnabled() && !locationEnabled())
        toastText = "Turn On both WiFi & Location";
    else if(!locationEnabled())
        toastText = "Turn On Location";
    else if(!wifiEnabled())
        toastText = "Turn On WiFi";


    if(!toastText.equals(""))
        Toast.makeText(this

                , toastText + " to show your location"

                , Toast.LENGTH_LONG)

                .show();


    return false;
}


@Override
public void onMyLocationClick(@NonNull Location location) {


    if(location.getAccuracy()>150)

        Toast.makeText(
```

```java
            this,

            "Location Accuracy is LOW. press again please!"+location,
Toast.LENGTH_SHORT

        ).show();



    }public boolean wifiEnabled(){

        WifiManager wifi = (WifiManager) getApplicationContext()

            .getSystemService(Context.WIFI_SERVICE);

        return wifi.isWifiEnabled();

    }
public boolean locationEnabled(){

        LocationManager    locationManager    =
(LocationManager) getSystemService(Context.LOCATION_SERVICE);

        return
locationManager.isProviderEnabled(LocationManager.GPS_PROVIDER)
&&

locationManager.isProviderEnabled(LocationManager.NETWORK_PRO
VIDER);

    } public void confirmClicked(View view) {

        /*

        take this location and set it as home address

         */

 Log.d(LogTags.Map_TAG,    "confirmClicked:    location    taken    =
"+pickedLocation.toString());
```

```
Toast.makeText(this,      "Your      home      location      was      saved!",
Toast.LENGTH_SHORT)

        .show();

// send data to parent activity

    Intent resultIntent = new Intent();

    resultIntent.putExtra("latitude-longitude",


pickedLocation.getLatitude()+","+pickedLocation.getLongitude());

    setResult(RESULT_OK, resultIntent);

    finish();

 }}
```

DEBUGGING:

```
@if "%DEBUG%" == "" @echo off
@rem
##############################################################################
##########

@rem

@rem Gradle startup script for Windows

@rem

@rem
##############################################################################
##########

@rem Set local scope for the variables with windows NT shell

if "%OS%"=="Windows_NT" setlocal

set DIRNAME=%~dp0
```

```
if "%DIRNAME%" == "" set DIRNAME=.

set APP_BASE_NAME=%~n0

set

APP_HOME=%DIRNAME%


@rem Add default JVM options here. You can also use JAVA_OPTS and
GRADLE_OPTS to pass JVM options to this script.

set DEFAULT_JVM_OPTS=

@rem Find java.exe

if defined JAVA_HOME goto findJavaFromJavaHome

set JAVA_EXE=java.exe

%JAVA_EXE% -version >NUL 2>&1

if "%ERRORLEVEL%" == "0" goto initecho.

echo ERROR: JAVA_HOME is not set and no 'java' command could be
found in your PATH.

echo.

echo Please set the JAVA_HOME variable in your environment to match
the

echo location of your Java installation.

goto fail:findJavaFromJavaHome

set JAVA_HOME=%JAVA_HOME:"=%

set JAVA_EXE=%JAVA_HOME%/bin/java.exe


if exist "%JAVA_EXE%" goto init
```

echo.

echo ERROR: JAVA_HOME is set to an invalid directory: %JAVA_HOME%

echo.

echo Please set the JAVA_HOME variable in your environment to match the

echo location of your Java installation.

goto fail:init

@rem Get command-line arguments, handling Windows variants

if not "%OS%" == "Windows_NT" goto win9xME_args:win9xME_args

@rem Slurp the command line arguments.

set CMD_LINE_ARGS=

set _SKIP=2:win9xME_args_slurp

if "x%~1" == "x" goto execute

set CMD_LINE_ARGS=%*:execute

@rem Setup the command line

set CLASSPATH=%APP_HOME%\gradle\wrapper\gradle-wrapper.jar

@rem Execute Gradle

"%JAVA_EXE%" %DEFAULT_JVM_OPTS% %JAVA_OPTS% %GRADLE_OPTS% "-Dorg.gradle.appname=%APP_BASE_NAME%" -classpath "%CLASSPATH%" org.gradle.wrapper.GradleWrapperMain %CMD_LINE_ARGS%:end

@rem End local scope for the variables with windows NT shell

if "%ERRORLEVEL%"=="0" goto mainEnd

:fail

rem Set variable GRADLE_EXIT_CONSOLE if you need the _script_ return code instead of

rem the _cmd.exe /c_ return code!

if not "" == "%GRADLE_EXIT_CONSOLE%" exit 1

exit /b 1:mainEnd

if "%OS%"=="Windows_NT" endlocal:omega

GitHubLink:IBM-Project-30949-1660193224