10 Final project

10.1 Idea

Covid-19 is remaining an interesting topic to work with. By understanding personal needs, an application is made for updating news about covid-19 from any country.
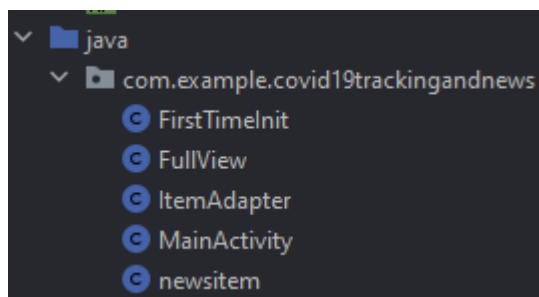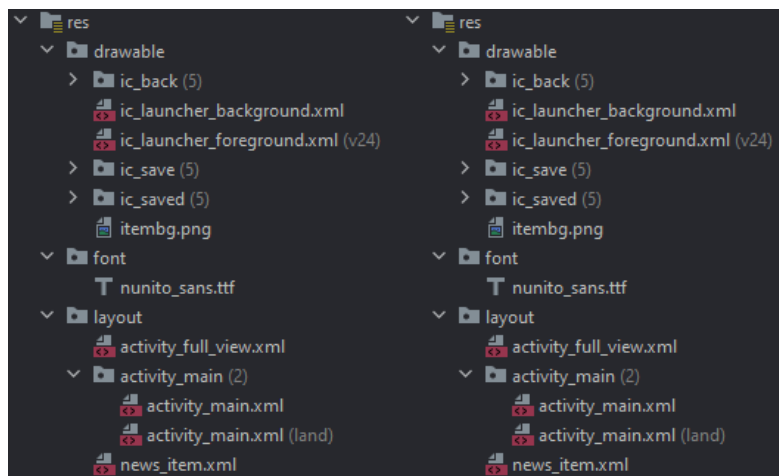
10.2 Design

10.2.1 File Management

- This project is storage on Gitlab:

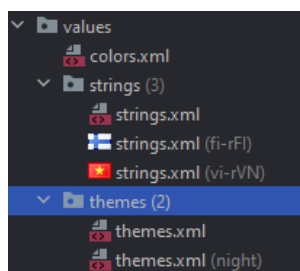 Minh Dang / Mobile Development 1 Final · GitLab (tamk.cloud)

PICTURE 1: JAVA Programing Scripts

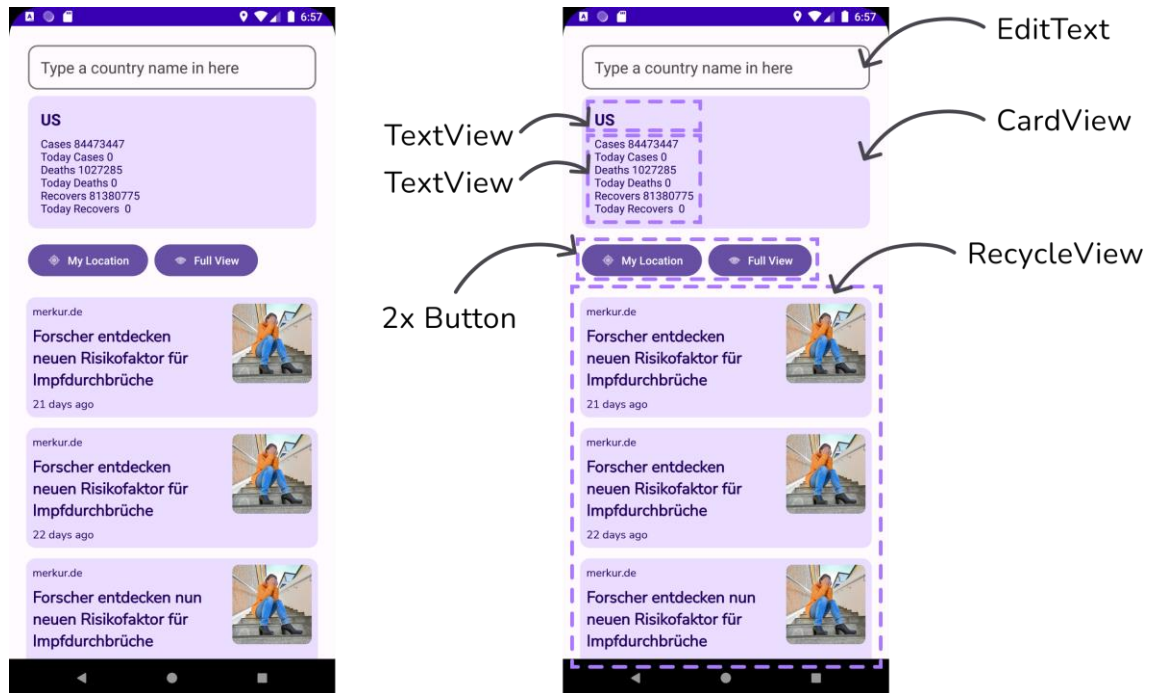PICTURE 2: Resource drawable, font, and layout
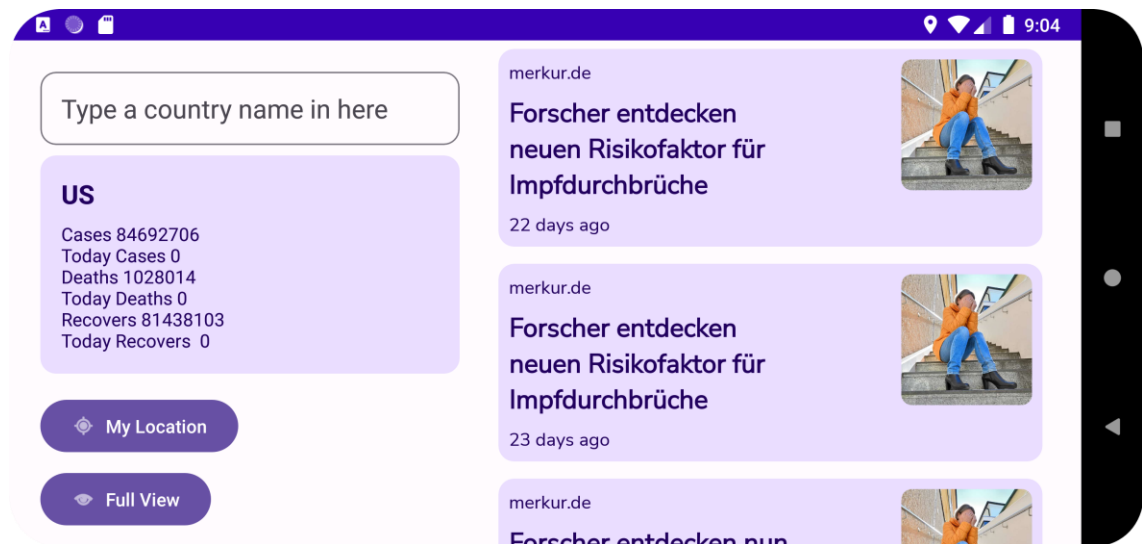

PICTURE 3: Resource values

10.2.2 Homepage interface

- This project design is inspired by the Material design 3 principle. [9]

PICTURE 1: UI/UX Design Portrait

PICTURE 2: UI/UX Design Landscape

10.2.3 Full view interface

PICTURE 1: UI/UX Design Portrait and landscape
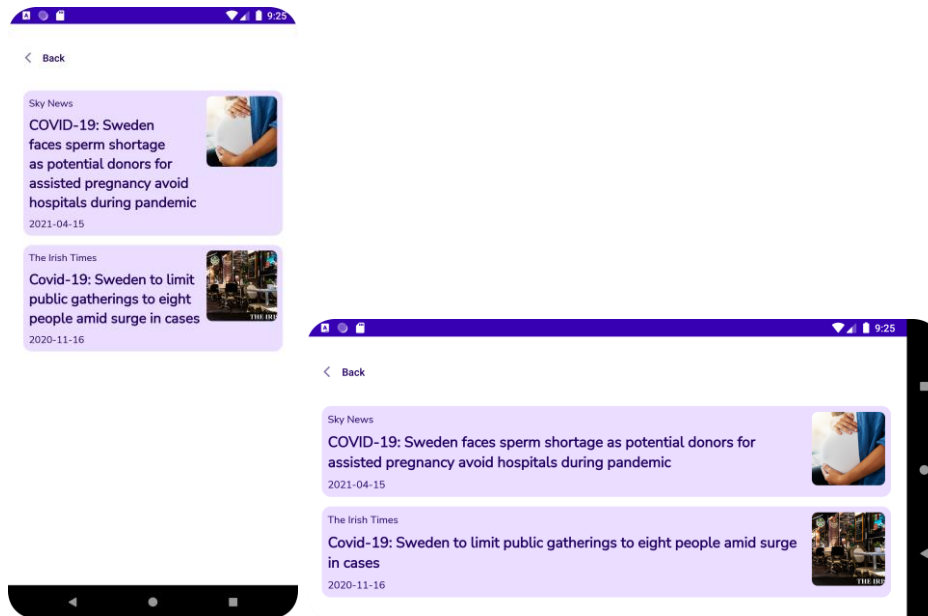
10.3 Instruction

10.3.1 Reading news

On the homepage, there are two areas containing information. Firstly, A card view presents the new covid-19 status in a specific country, which presents the value of cases, today cases, deaths, today deaths, recovers, and today recovers. Secondly, a list view contains local news headline about covid-19.

PICTURE 1: Reading news
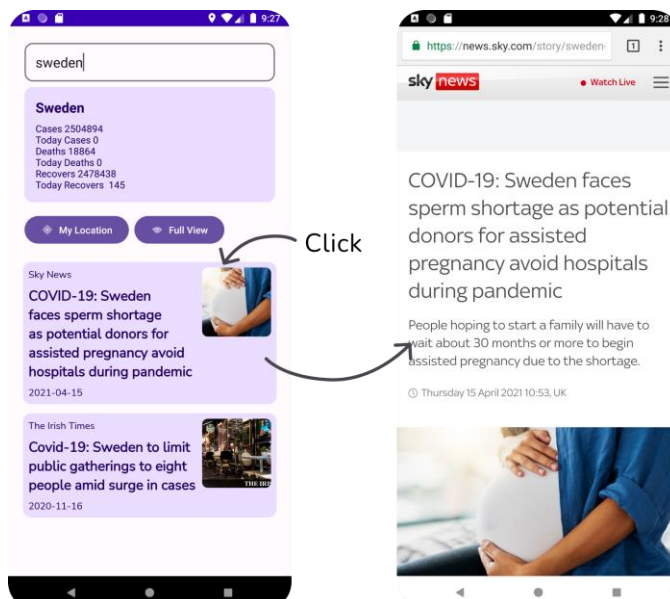
10.3.2 Change location – my location

By clicking "My location" Button, user could change location to user location (Country) by using longitude and latitude from the GPS.

PICTURE 1: Using GPS for changing the location
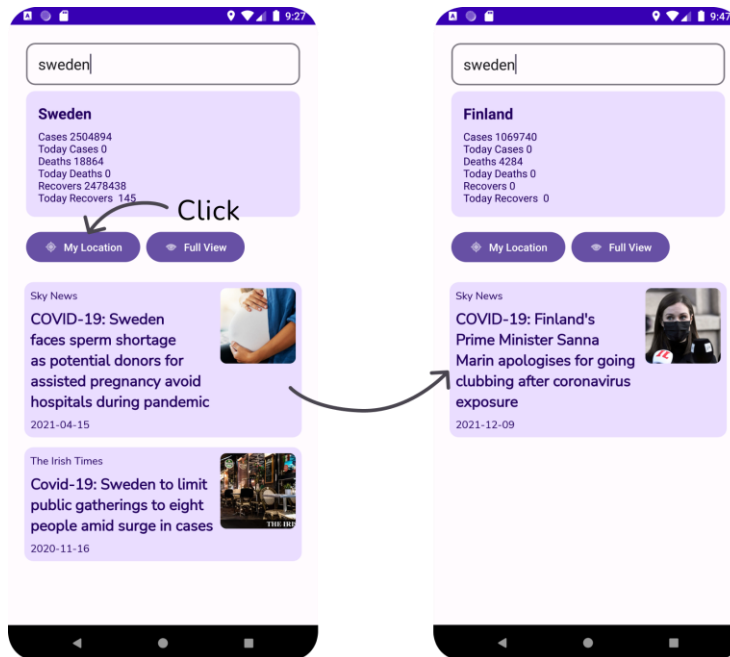
10.3.3 Change location – input location

In the highest component, user can modify the location to a specific country. Additionally, it is auto complete edit text, so user could change location easily.
[10]

PICTURE 1: Changing the location
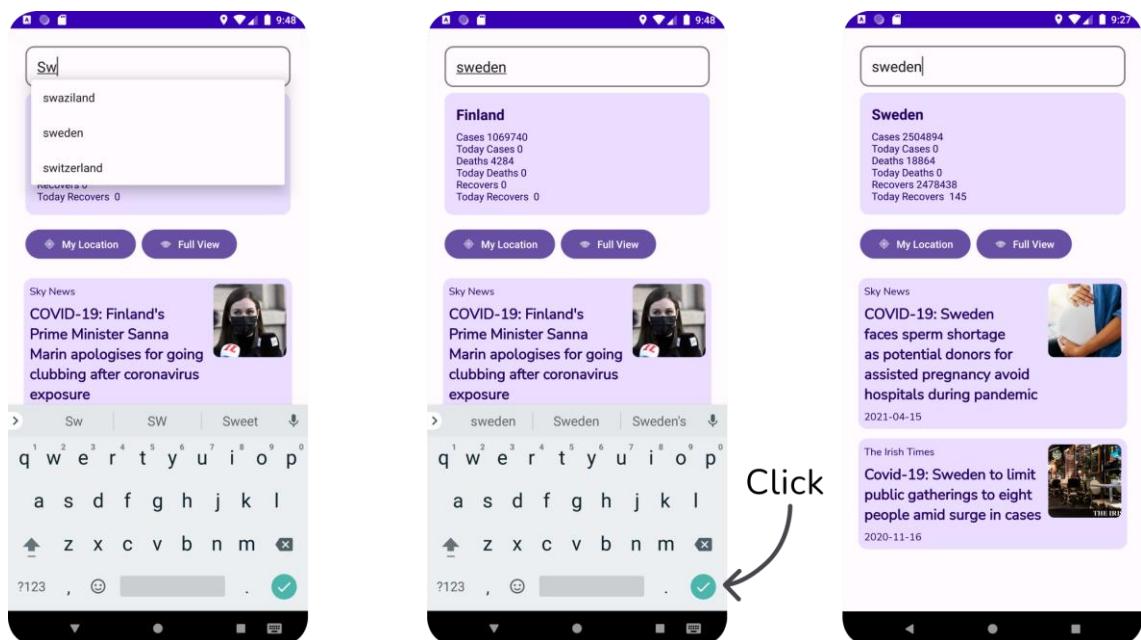
10.3.4 Change to second style of view

For changing style of view, user can see more news items by clicking "Full View" button.

PICTURE 1: Changing the style of view

10.3.5 Error prevention

When location is invalid, hint text or input text will blink and turn red for an amount of time. [11]

PICTURE 1: Feedback when user submit unreal value or null value

10.4 Technical Review

10.4.1 Activity lifecycle

In Main Activity, some values are saved in each lifecycle. There are latitude as double, longitude as double, country as string and newsItemArrayList as Serializable. During restoring process, the data in Covid19 card and Recycle view will be renewed. [12]

PICTURE 1: Saving and restoring data by using Bundle in Main Activity

```java
// Bundle savedInstanceState
@Override
protected void onSaveInstanceState(Bundle savedInstanceState) {
    super.onSaveInstanceState(savedInstanceState);
    savedInstanceState.putDouble("LATITUDE", latitude);
    savedInstanceState.putDouble("LONGITUDE", longitude);
    savedInstanceState.putString("COUNTRY", country);
    savedInstanceState.putSerializable("NEWSLIST", newsItemArrayList);
}

@Override
protected void onRestoreInstanceState(Bundle savedInstanceState) {
    super.onRestoreInstanceState(savedInstanceState);
    latitude = savedInstanceState.getDouble( key: "LATITUDE");
    longitude = savedInstanceState.getDouble( key: "LONGITUDE");
    country = savedInstanceState.getString( key: "COUNTRY");
    newsItemArrayList = (ArrayList<newsitem>) savedInstanceState.getSerializable( key: "NEWSLIST");
    TextView CountryName = findViewById(R.id.CountryName);
    CountryName.setText(country);
    oldLocation = country;
    getCovid19Data();
    getNewsUpdateUI();
}
```
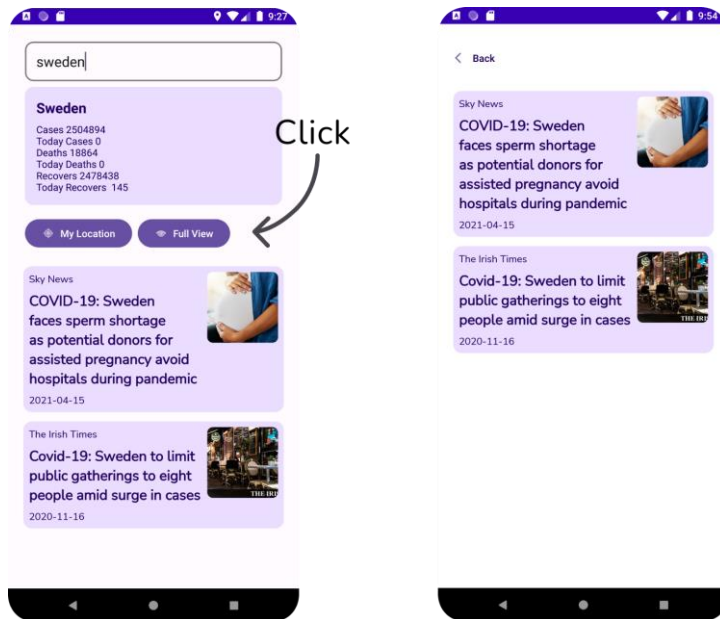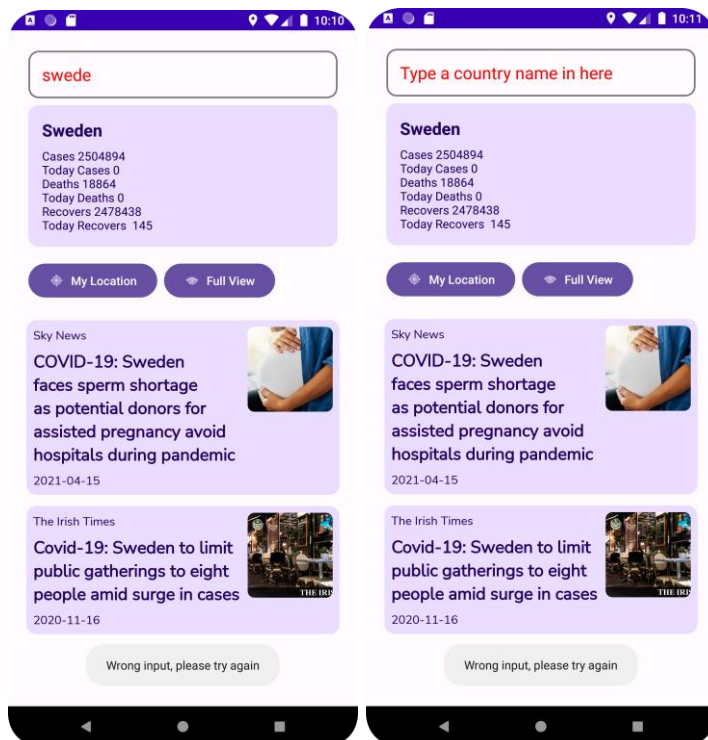
In Full View Activity, only newsItemArrayList is saved and restored. During restoring process, the data in Recycle view will be renewed.

PICTURE 2: Saving and restoring data by using Bundle in Full View Activity

```java
// Bundle savedInstanceState
@Override
protected void onSaveInstanceState(Bundle savedInstanceState) {
    super.onSaveInstanceState(savedInstanceState);
    savedInstanceState.putSerializable("NEWSLIST", newsItemArrayList);
}

@Override
protected void onRestoreInstanceState(Bundle savedInstanceState) {
    super.onRestoreInstanceState(savedInstanceState);
    newsItemArrayList = (ArrayList<newsitem>) savedInstanceState.getSerializable( key: "NEWSLIST");
    getNewsUpdateUI();
}
```

PICTURE 3: Sending data from Main Activity to Full View Activity

```java
// Change to full view after click button
public void changeToFullView(View view) {
    Intent intentFullView = new Intent( packageContext: this, FullView.class);
    intentFullView.putExtra( name: "NEWS", (Serializable) newsItemArrayList);
    startActivity(intentFullView);
}
```

PICTURE 4: Set local newsItemArrayList to the serializable data from Main Activity

```java
@Override
protected void onCreate(Bundle savedInstanceState) {
    requestWindowFeature(Window.FEATURE_NO_TITLE);

    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_full_view);

    newsItemArrayList = (ArrayList<newsitem>) getIntent().getSerializableExtra( name: "NEWS");
```

PICTURE 5: States inside Android Lifecycle

```java
// ANDROID LIFECYCLE

@Override
protected void onCreate(Bundle savedInstanceState) {...}

@Override
protected void onPause() {...}

@Override
protected void onStop() { super.onStop(); }

@Override
protected void onResume() {...}

@Override
protected void onDestroy() {...}
```

10.4.2 REST API

PICTURE 1: REST API for getting COVID-19 status from a specific country [13]

```java
351     private void getCovid19Data() {
352         covid19URL = "https://corona.lmao.ninja/v2/countries/" + country + "?yesterday&strict&query";
353         covid19Data = new StringRequest(Request.Method.GET, covid19URL,
354             response -> {
355                 // Toast.makeText(this, response, Toast.LENGTH_LONG).show();
356                 parseCovidJsonAndUpdateUI(response);
357             }, error -> {
358             Toast.makeText( context: this, text: "Some error", Toast.LENGTH_LONG).show();
359         }
360         );
361
362         queue.add(covid19Data);
363     }
```

PICTURE 2: REST API for getting news from a specific country with COVID-19 topic [14]

```
365    private void getNews() {
366        newsURL = "https://gnews.io/api/v4/search?q=\"covid-19 " + country + "\"&token=";
367        newsData = new StringRequest(Request.Method.GET, newsURL,
368            response -> {
369                // Toast.makeText(this, response, Toast.LENGTH_LONG).show();
370                getNewsList(response);
371            }, error -> {
372            Toast.makeText( context: this,  text: "Some error", Toast.LENGTH_LONG).show();
373        }
374        );
375
376        queue.add(newsData);
377    }
378
```

PICTURE 3: REST API for getting country by using latitude and longitude [15]

```
public void getLocation(View view) {

    String url = "http://api.geonames.org/findNearbyPlaceNameJSON?lat=" + latitude + "&lng=" + longitude + "&username=minhdang";
    StringRequest countryData = new StringRequest(Request.Method.GET, url,
        response -> {
            // Toast.makeText(this, response, Toast.LENGTH_LONG).show();
            parseCountryJsonAndUpdateUI(response);
        }, error -> {
        Toast.makeText( context: this,  text: "Current country not found", Toast.LENGTH_LONG).show();
    }
    );
    queue.add(countryData);
}
```

10.4.3 Device API

Location API is attached to this project to get longitude and latitude.

PICTURE 1: Changing value when location changed

```
// GPS
@Override
public void onLocationChanged(@NonNull Location location) {
    latitude = location.getLatitude();
    longitude = location.getLongitude();
}
```

10.4.4 Permission

PICTURE 1: Permission requests in Android Manifest files.

```
<uses-permission android:name="android.permission.ACCESS_FINE_LOCATION" />
<uses-permission android:name="android.permission.ACCESS_COARSE_LOCATION" />
<uses-permission android:name="android.permission.INTERNET" />
<uses-permission android:name="android.permission.ACCESS_NETWORK_STATE" />
<uses-permission android:name="android.permission.ACCESS_BACKGROUND_LOCATION" />
```

10.4.5 Optimization

- One-time initiation.

   To minimize fetching tries, an application class "FirstTimeInit

" is included. For instance, "isInit" value is only created one-time after the application started. [16]

PICTURE 1: "FirstTimeInit" class

```
package com.example.covid19trackingandnews;

import android.app.Application;

public class FirstTimeInit extends Application {
    public static boolean isInit;
    @Override
    public void onCreate() {
        super.onCreate();
        isInit=false;
    }
}
```

PICTURE 2: Condition for running the startupInit() function

```
// Init startupInit once when App start
firstTimeInit = (FirstTimeInit) this.getApplicationContext();
if (!FirstTimeInit.isInit) {
    startupInit();
    // Toast.makeText(getApplicationContext(), "Inited", Toast.LENGTH_LONG).show();
    FirstTimeInit.isInit = true;
}
```

- GPS disable when Activity onPause()

To avoid using GPS when activity is on pause, the GPS updates will be re-moved when Activity pausing and be allowed to start again when Activity re-sumes running.

PICTURE 3: onPause function

```
@Override
protected void onPause() {
    super.onPause();
    locationManager.removeUpdates( listener: this);
}
```

PICTURE 4: onResume function

```java
@Override
protected void onResume() {
    super.onResume();
    if (ActivityCompat.checkSelfPermission( context: this,
            Manifest.permission.ACCESS_FINE_LOCATION) != PackageManager.PERMISSION_GRANTED
            && ActivityCompat.checkSelfPermission( context: this,
            Manifest.permission.ACCESS_COARSE_LOCATION) != PackageManager.PERMISSION_GRANTED) {
        ActivityCompat.requestPermissions(
                activity: this,
                new String[]{Manifest.permission.ACCESS_FINE_LOCATION,
                Manifest.permission.ACCESS_COARSE_LOCATION},
                requestCode: 0);
        return;
    }
    locationManager.requestLocationUpdates(
            LocationManager.GPS_PROVIDER,
            minTimeMs: 0,
            minDistanceM: 0,
            listener: this);
}
```

- Hide software keyboard when task is finish. [17]

After clicked "DONE" icon, the keyboard will automatic close to avoid un-wanted responses from application.

PICTURE 5: Method to close soft keyboard when the input is done. [18]

```java
// - Edittext listener
private final MaterialAutoCompleteTextView.OnEditorActionListener actionListener = new MaterialAutoCompleteTextView.OnEditorActionListener() {
    void warningInput() {
        tries = 0;
        Toast.makeText(getApplicationContext(), text: "Wrong input, please try again", Toast.LENGTH_LONG).show();
        wrongInput(inputCountry);
    }

    @Override
    public boolean onEditorAction(TextView v, int actionId, KeyEvent event) {
        boolean handled = false;
        if (actionId == EditorInfo.IME_ACTION_DONE) {
            String inStr = inputCountry.getText().toString().toLowerCase();
            hideKeyboard( activity: MainActivity.this);
            if (inStr.length() != 0)
                if (Arrays.asList(countries).contains(inStr)) setNewCountry(capitalizeCase(inStr));
                else warningInput();
            else {
                warningInput();
            }
            handled = true;
        }
        return handled;
    }
};
```

PICTURE 6: Function for hiding keyboard

```java
// INPUT FUNCTIONS
// Hide Keyboard
public static void hideKeyboard(Activity activity) {
    InputMethodManager inputMethodManager = (InputMethodManager) activity
            .getSystemService(Context.INPUT_METHOD_SERVICE);
    View focus = activity.getCurrentFocus();
    if (focus != null)
        inputMethodManager.hideSoftInputFromWindow(focus.getWindowToken(), InputMethodManager.HIDE_NOT_ALWAYS);
}
```

10.4.6 Localization

PICTURE 1: STRING.XML editor screenshot

Key	Resource Folder	Untranslatable	Default Value	Finnish (fi) in Finland (FI)	Vietnamese (vi) in Vietnam (VN)
app_name	app/src/main/res	☐	Covid 19 Tracking and News	Covid 19 -seuranta ja uutiset	Theo dõi và tin tức về Covid-19
news_title	app/src/main/res	☐	Covid 19 Tracking and News	Covid 19 -seuranta ja uutiset	Theo dõi và tin tức về Covid-19
news_author	app/src/main/res	☐	Covid 19 Tracking and News	Covid 19 -seuranta ja uutiset	Theo dõi và tin tức về Covid-19
published_time	app/src/main/res	☐	Covid 19 Tracking and News	Covid 19 -seuranta ja uutiset	Theo dõi và tin tức về Covid-19
cases	app/src/main/res	☐	Cases	Tapaukset	Tổng số ca
today_cases	app/src/main/res	☐	Today Cases	Tapausten määrä tänään	Tổng số ca hôm nay
deaths	app/src/main/res	☐	Deaths	Kuolemat	Tổng số người tử vong
today_deaths	app/src/main/res	☐	Today Deaths	Kuolemien määrä tänään	Tổng số người tử vong hôm nay
recovered	app/src/main/res	☐	Recovers	Palautunut	Tổng số người hồi phục
today_recovered	app/src/main/res	☐	Today Recovers	Tänään palautunut	Tổng số người hồi phục hôm nay
country_name_hint	app/src/main/res	☐	Type a country name in here	Kirjoita maan nimi tähän	Nhập tên tên một quốc gia
my_location	app/src/main/res	☐	My Location	Minun sijaintini	Vị trí của tôi
full_view	app/src/main/res	☐	Full View	Täysi näkymä	Mở rộng
back_button	app/src/main/res	☐	Back	Mene takaisin	Quay lại

PICTURE 2: Changes when changing system language to Vietnamese
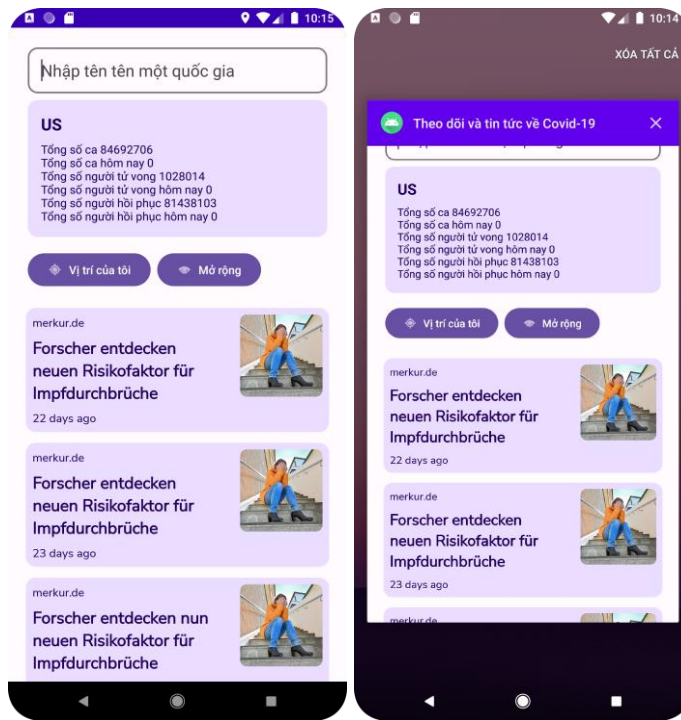
10.5 Future Improvement

10.5.1 Error feedback while not connecting to the internet.

This application does not have a function to response when internet is not available. However, some message from fetching functions will inform some detailed error information using Toast. User is recommended to connect to the internet while using application.

10.5.2 Lost data when fetching

Sometime, fetching function for covid-19 status might be lost. It could be affected by request limitation from API.