

EXPERIMENT 8

Aim :

Develop a Weather Application for Mobile Phone using Android Studio.

Theory :

API stands for Application Programming Interface. A tool that allows for the automatic transfer of data from one program to one or more applications or programs.

We will use OpenWeather API to get the latest weather updates for this application. This API will automatically fetch all the latest weather updates for our application. First thing we have to do is get this key from the website that is mentioned below:

<https://openweathermap.org/api>

Create your account on this website using your email address and create your API.

Requirements :

- Android Studio
- Knowledge of XML and JAVA
- Android emulator (or) Android Mobile

Steps for Online News Application :

Step 1: Create a **New Project**

Create a new project in Android Studio and select **Java** as the programming language.

Step 2: Get **API Key**

Copy the API key you created and store it in a string in **MainActivity.java** file in your project.

Step 3: Working with **activity_main.xml** file

Here in the XML file, we define our layout for the weather app. Here we display *Temperature, Last updated time, Forecast, City name, Country name, Humidity, Minimum Temperature, Maximum Temperature, Time of Sunrise, and Time of Sunset*. Here we add search functionality, which means we can search the temperature by city names.

Code :**activity_main.xml** file

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.core.widget.NestedScrollView
xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"
android:layout_height="match_parent"
android:background="@drawable/weather_app_background"
tools:context=".MainActivity"
android:padding="10dp">
<LinearLayout
android:orientation="vertical"
android:layout_width="match_parent"
android:layout_height="match_parent">
<RelativeLayout
android:id="@+id/first"
android:layout_width="match_parent"
android:layout_height="40dp"
android:layout_marginStart="20dp"
android:layout_marginTop="30dp"
android:layout_marginEnd="20dp"
android:padding="2dp"
android:background="@drawable/rounded_border"
android:gravity="center_horizontal">
<EditText
android:id="@+id/Your_city"
android:layout_width="wrap_content"
android:layout_height="match_parent"
android:layout_alignParentStart="true"
android:layout_marginStart="10dp"
android:background="@drawable/rounded_border"
android:ems="10"
android:hint="@string/enter_your_city_name"
android:inputType="text"
android:textColor="#ffffff"
android:textColorHint="#939393"
android:textSize="15sp"
android:layout_centerVertical="true"/>
<ImageView
android:id="@+id/search"
android:layout_width="35dp"
android:layout_height="35dp"
android:background="?android:attr/selectableItemBackground"
android:layout_alignParentEnd="true"
android:layout_centerVertical="true"
android:src="@drawable/search_icon"/>
```

```
</RelativeLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="20dp"
    android:orientation="vertical">
    <TextView
        android:id="@+id/forecast"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textAllCaps="true"
        android:layout_gravity="center_horizontal"
        android:textColor="@color/text2"
        android:textSize="16sp"
        android:includeFontPadding="false" />
    <TextView
        android:id="@+id/temp"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:textColor="@color/text2"
        android:textSize="40sp"
        android:includeFontPadding="false"
        android:layout_gravity="center_horizontal"
        android:textStyle="bold" />
    <TextView
        android:id="@+id/time"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textColor="@color/text2"
        android:layout_marginTop="40dp"
        android:textSize="13sp"
        android:layout_gravity="center_horizontal"
        android:includeFontPadding="false"/>
</LinearLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="210dp"
    android:orientation="vertical"
    android:gravity="center_horizontal">
    <TextView
        android:id="@+id/city"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textColor="@color/text3"
        android:textSize="18sp"
        android:includeFontPadding="false"
```

```
android:textStyle="bold" />
<TextView
    android:id="@+id/country"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textColor="@color/text1"
    android:textSize="16sp"
    android:layout_marginTop="8dp"
    android:includeFontPadding="false" />
</LinearLayout>
<View
    android:layout_width="150dp"
    android:layout_height="1dp"
    android:background="@color/colorPrimaryDark"
    android:layout_marginTop="15dp"
    android:layout_gravity="center_horizontal"/>
<LinearLayout
    android:orientation="vertical"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="5dp">
    <LinearLayout
        android:orientation="horizontal"
        android:layout_width="match_parent"
        android:layout_height="wrap_content">
        <TextView
            android:layout_width="120dp"
            android:layout_height="wrap_content"
            android:gravity="start"
            android:text="Humidity"
            android:textAllCaps="false"
            android:layout_gravity="center_vertical"
            android:textColor="@color/text1"
            android:textSize="16sp"
            android:layout_marginStart="5dp"
            android:textStyle="bold" />
        <ImageView
            android:layout_width="20dp"
            android:layout_height="20dp"
            android:src="@drawable/hum"
            android:layout_gravity="center_vertical"
            android:layout_marginStart="38dp" />
        <TextView
            android:id="@+id/humidity"
            android:layout_width="80dp"
            android:layout_height="wrap_content"
            android:layout_gravity="end"
            android:gravity="center"
```

```
        android:padding="5dp"
        android:text=" - "
        android:layout_marginStart="80dp"
        android:textColor="@color/text1"
        android:textSize="16sp" />
    </LinearLayout>
    <LinearLayout
        android:orientation="horizontal"
        android:layout_width="match_parent"
        android:layout_height="wrap_content">
        <TextView
            android:layout_width="120dp"
            android:layout_height="wrap_content"
            android:gravity="start"
            android:text="Min Temperature"
            android:textColor="@color/text1"
            android:textSize="15sp"
            android:layout_marginStart="5dp"
            android:layout_gravity="center_vertical"
            android:textStyle="bold" />
        <ImageView
            android:layout_width="20dp"
            android:layout_height="20dp"
            android:src="@drawable/tem_down"
            android:layout_gravity="center_vertical"
            android:layout_marginStart="38dp" />
        <TextView
            android:id="@+id/min_temp"
            android:layout_width="80dp"
            android:layout_height="wrap_content"
            android:layout_gravity="center_vertical"
            android:gravity="center"
            android:padding="5dp"
            android:text=" - "
            android:layout_marginStart="80dp"
            android:textColor="@color/text1"
            android:textSize="16sp" />
    </LinearLayout>
    <LinearLayout
        android:orientation="horizontal"
        android:layout_width="match_parent"
        android:layout_height="wrap_content">
        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:gravity="start"
            android:text="Max Temperature"
            android:textColor="@color/text1"
```

```
android:textSize="15sp"
android:layout_gravity="center_vertical"
android:layout_marginStart="5dp"
android:textStyle="bold" />
<ImageView
android:layout_width="20dp"
android:layout_height="20dp"
android:src="@drawable/tem_up"
android:layout_gravity="center_vertical"
android:layout_marginStart="38dp" />
<TextView
android:id="@+id/max_temp"
android:layout_width="80dp"
android:layout_height="wrap_content"
android:layout_gravity="center_vertical"
android:gravity="center"
android:padding="5dp"
android:text=" - "
android:layout_marginStart="80dp"
android:textColor="@color/text1"
android:textSize="16sp"/>
</LinearLayout>
</LinearLayout>
<LinearLayout
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_marginLeft="20dp"
android:layout_marginTop="15dp"
android:layout_marginRight="20dp"
android:orientation="horizontal"
android:layout_gravity="center_vertical"
android:weightSum="2">
<LinearLayout
android:layout_width="0dp"
android:layout_height="wrap_content"
android:layout_margin="5dp"
android:layout_weight="1"
android:gravity="center"
android:orientation="vertical">
<ImageView
android:layout_width="40dp"
android:layout_height="wrap_content"
android:src="@drawable/sunrise"/>
<TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Sunrise"
android:includeFontPadding="false"
```

```
android:textColor="@color/text3"/>
<TextView
android:id="@+id/sunrises"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="5dp"
android:text=" - "
android:includeFontPadding="false"
android:gravity="center"
android:padding="5dp"
android:textColor="@color/text1"
android:textSize="14sp" />
</LinearLayout>
<LinearLayout
android:layout_width="0dp"
android:layout_height="wrap_content"
android:layout_margin="5dp"
android:layout_weight="1"
android:gravity="center"
android:orientation="vertical">
<ImageView
android:layout_width="40dp"
android:layout_height="wrap_content"
android:src="@drawable/sunset"/>
<TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Sunset"
android:includeFontPadding="false"
android:textColor="@color/text3"/>
<TextView
android:id="@+id/sunsets"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="5dp"
android:text=" - "
android:gravity="center"
android:padding="5dp"
android:textColor="@color/text1"
android:textSize="14sp" />
</LinearLayout>
</LinearLayout>
</LinearLayout>
</androidx.core.widget.NestedScrollView>
```

Step 4: Working with **MainActivity.java** file

Code :**MainActivity.java file**

```
package com.example.weatherinfo;
import androidx.appcompat.app.AppCompatActivity;
import android.os.AsyncTask;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.ImageView;
import android.widget.TextView;
import android.widget.Toast;
import com.android.volley.toolbox.JsonRequest;
import org.json.JSONObject;
import java.text.SimpleDateFormat;
import java.util.Date;
import java.util.Locale;
public class MainActivity extends AppCompatActivity {
    String CITY;
    String API = "Your Api Key here";
    ImageView search;
    EditText etCity;
    TextView city,country,time,temp,forecast,humidity,min_temp,max_temp,sunrises,sunsets;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main); }
    etCity = (EditText) findViewById(R.id.Your_city);
    search = (ImageView) findViewById(R.id.search);
    city = (TextView) findViewById(R.id.city);
    country = (TextView) findViewById(R.id.country);
    time = (TextView) findViewById(R.id.time);
    temp = (TextView) findViewById(R.id.temp);
    forecast = (TextView) findViewById(R.id.forecast);
    humidity = (TextView) findViewById(R.id.humidity);
    min_temp = (TextView) findViewById(R.id.min_temp);
    max_temp = (TextView) findViewById(R.id.max_temp);
    sunrises = (TextView) findViewById(R.id.sunrises);
    sunsets = (TextView) findViewById(R.id.sunsets);
    search.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            CITY = etCity.getText().toString();
            new weatherTask().execute(); }
        });
    }
}
```



```
class weatherTask extends AsyncTask<String, Void, String>{
@Override
protected void onPreExecute() {
super.onPreExecute(); }
@Override
protected String doInBackground(String... args) {
String response = HttpRequest.excuteGet("https://api.openweathermap.org/data/2.5/weather?q=" + CITY + "&units=metric&appid=" + API);
return response; }
@Override
protected void onPostExecute(String result) {
try {
JSONObject jsonObj = new JSONObject(result);
JSONObject main = jsonObj.getJSONObject("main");
JSONObject weather = jsonObj.getJSONArray("weather").getJSONObject(0);
JSONObject sys = jsonObj.getJSONObject("sys");
String city_name = jsonObj.getString("name");
String countryname = sys.getString("country");
Long updatedAt = jsonObj.getLong("dt");
String updatedAtText = "Last Updated at: " + new SimpleDateFormat("dd/MM/yyyy hh:mm a", Locale.ENGLISH).format(new Date(updatedAt * 1000));
String temperature = main.getString("temp");
String cast = weather.getString("description");
String humi_dity = main.getString("humidity");
String temp_min = main.getString("temp_min");
String temp_max = main.getString("temp_max");
Long rise = sys.getLong("sunrise");
String sunrise = new SimpleDateFormat("hh:mm a", Locale.ENGLISH).format(new Date(rise * 1000));
Long set = sys.getLong("sunset");
String sunset = new SimpleDateFormat("hh:mm a", Locale.ENGLISH).format(new Date(set * 1000));
city.setText(city_name);
country.setText(countryname);
time.setText(updatedAtText);
temp.setText(temperature + "°C");
forecast.setText(cast);
humidity.setText(humi_dity);
min_temp.setText(temp_min);
max_temp.setText(temp_max);
sunrises.setText(sunrise);
sunsets.setText(sunset);
} catch (Exception e) {
Toast.makeText(MainActivity.this, "Error:" + e.toString(), Toast.LENGTH_SHORT).show(); }
}
}
}
```

App Screenshots :