Weather Forecast App

A GDG 2cc Project Report

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16BIT0125

in partial fulfillment for the award of the degree of

B.TECH

in

Information Technology

VIT®

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

SCHOOL OF INFORMATION TECHNOLOGY AND ENGINEERING

DECLARATION BY THE CANDIDATE

I hereby declare that the project report entitled **“Weather forecast App”** submitted by me to Vellore Institute of Technology, Vellore in partial fulfillment of the requirement for the award of the course of “**Open Source Development for Google Applications” EXC1081** in **GDG.**

I would like to thank gdg for supporting and guiding us throughout the year and helping us learn and produce something out of the blue.

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Reg Number: 16BIT0125

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1.1 ABSTRACT

In this project, I have created a Mobile App which takes the location from the user and display the maximum and minimum temperature and forecast of the day. This app also provides the forecast of the next 5 day.

For this app, I have used AccuWeather APIs, using this api first I have fetched the location key after providing location key to forecast api of AccuWeather I fetched all the weather details of next 5 days and displayed that to the next activity.

1.2 INTRODUCTION

1.2.1 AccuWeather

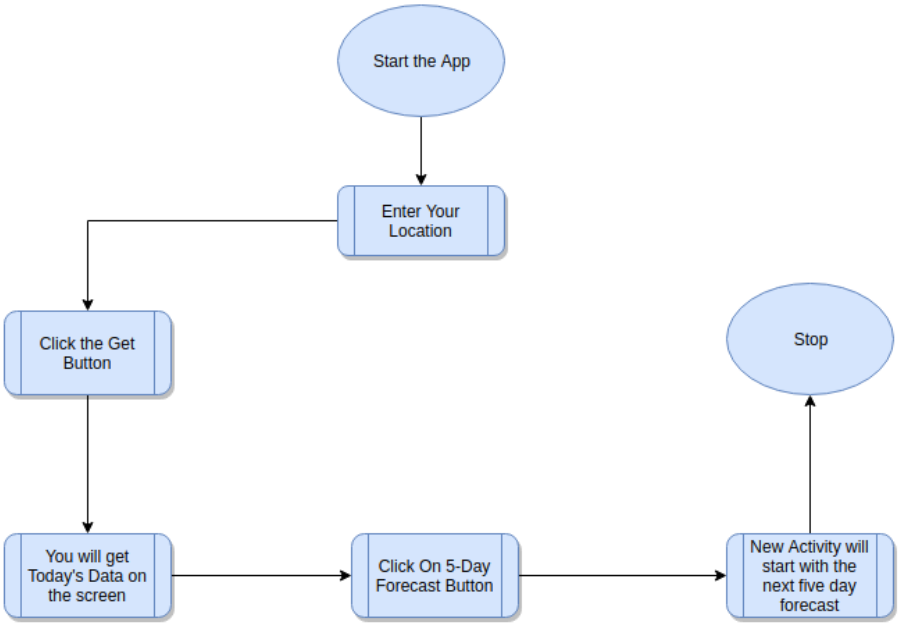
AccuWeather is a weather APIs that provides Location Api, Forecast API, Current Condition API, and much more facility

1. Location API –Using Location API we can get a location key for our desired location. We can use the location key to retrieve weather data from the Forecast or Current Conditions API.

2. Forecast API – Using Forecast API we can get forecast information for a specific location.

3. Current Conditions API – Using Current Condition API we can get Current Conditions data for a specific location.

1.3 Flow chart


Start the App
Enter Your Location
Click the Get Button
You will get Today's Data on the screen
Click On 5-Day Forecast Button
New Activity will start with the next five day forecast
Stop

1.4 Code

WeatherActivity.java

```
package com.example.abhay.mausamaajkal;


import android.content.Intent;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.ListView;
import android.widget.TextView;
import android.widget.Toast;

import com.example.abhay.http.LocationApi;
import com.example.abhay.http.WeatherAPI;
import com.example.abhay.model.ForcastModel;
import com.example.abhay.model.city.City;
import com.example.abhay.model.weather.Weather;

import java.text.NumberFormat;
import java.util.ArrayList;


import okhttp3.OkHttpClient;
import okhttp3.logging.HttpLoggingInterceptor;
import retrofit2.Call;
import retrofit2.Callback;
import retrofit2.Response;
import retrofit2.Retrofit;
import retrofit2.converter.gson.GsonConverterFactory;

public class WeatherActivity extends AppCompatActivity {


  Weather weather;
```

```
    ArrayList<City> cities;

    EditText edtCityName;
    Button btnSend,btnNextFiveDay;

    TextView txtMinTemp,txtMaxTemp,txtMaxPhrase,txtMinPhrase;




    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_weather);


        edtCityName=(EditText)findViewById(R.id.edtCityName);

        btnSend=(Button)findViewById(R.id.btnSend);
        btnNextFiveDay=(Button)findViewById(R.id.btnNextFiveDay);

        txtMinTemp=(TextView) findViewById(R.id.txtMinTemp);
        txtMaxTemp=(TextView) findViewById(R.id.txtMaxTemp);
        txtMinPhrase=(TextView) findViewById(R.id.txtMinPhrase);
        txtMaxPhrase=(TextView) findViewById(R.id.txtMaxPhrase);



        btnSend.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {


                String cityName="";
                String locationKey="";
                cityName=edtCityName.getText().toString().trim();

                if (cityName!=null){
                    if (locationKey!=null) {
                        weather = getWeatherData(getLocationKey(cityName));
                    }
                }
// progressDialog.dismiss();
                if (weather!=null) {

                    NumberFormat nf = NumberFormat.getInstance();
                    nf.setMinimumFractionDigits(2);

                    String
minTemp=fahrenheitToCelcius(weather.getDailyForecasts().get(0).getTemperature().getMinimum().getValue());
                    String
maxTemp=fahrenheitToCelcius(weather.getDailyForecasts().get(0).getTemperature().getMaximum().getValue());



                    txtMinTemp.setText(minTemp+"°C");
                    txtMaxTemp.setText(maxTemp+"°C");
                    txtMaxPhrase.setText(weather.getDailyForecasts().get(0).getDay().getIconPhrase().toString());
                    txtMinPhrase.setText(weather.getDailyForecasts().get(0).getNight().getIconPhrase().toString());

                }

            }
        });

        btnNextFiveDay.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {

// progressDialog.setMessage("Fetching Data Please Wait");
// progressDialog.show();
                ArrayList<ForcastModel> forcastModels=new ArrayList<>();
                for (int i=0;i<weather.getDailyForecasts().size();i++){
                    String date=weather.getDailyForecasts().get(i).getDate().split("T")[0];
                    String
maxTemp=fahrenheitToCelcius(weather.getDailyForecasts().get(i).getTemperature().getMaximum().getValue());
                    String
minTemp=fahrenheitToCelcius(weather.getDailyForecasts().get(i).getTemperature().getMinimum().getValue());
                    String maxTempPhrase=weather.getDailyForecasts().get(i).getDay().getIconPhrase();
                    String minTempPhrase=weather.getDailyForecasts().get(i).getNight().getIconPhrase();
                    ForcastModel model=new ForcastModel(date,maxTemp,minTemp,maxTempPhrase,minTempPhrase);
                    forcastModels.add(model);
                }

// progressDialog.dismiss();

                Intent intent=new Intent(WeatherActivity.this,
                        ForcastActivity.class).putExtra("forcastData",forcastModels);

                startActivity(intent);

            }
        });








    }

    public String getLocationKey(String cityName){
        // For city data call


        //OkHttp Logging interceptor
        OkHttpClient.Builder okHttpClientBuilder=new OkHttpClient.Builder();
        HttpLoggingInterceptor loggingInterceptor=new HttpLoggingInterceptor();

        //setting level to body
        loggingInterceptor.setLevel(HttpLoggingInterceptor.Level.BODY);

        //adding inspector to builder
        okHttpClientBuilder.addInterceptor(loggingInterceptor);

        //creating retrofit builder
        Retrofit.Builder builder=new Retrofit.Builder()
                .baseUrl("http://dataservice.accuweather.com/locations/v1/")
                .addConverterFactory(GsonConverterFactory.create())
                .client(okHttpClientBuilder.build());

        Retrofit retrofit=builder.build();



        LocationApi locationApi=retrofit.create(LocationApi.class);

        Call<ArrayList<City>> listCitiesCall=locationApi.getCityData(cityName);

        listCitiesCall.enqueue(new Callback<ArrayList<City>>() {
            @Override
            public void onResponse(Call<ArrayList<City>> call, Response<ArrayList<City>> response) {
                cities=response.body();
                Toast.makeText(WeatherActivity.this,"Fetching City Data",Toast.LENGTH_SHORT).show();

            }

            @Override
            public void onFailure(Call<ArrayList<City>> call, Throwable t) {
                Toast.makeText(WeatherActivity.this,"Failed to get city data",Toast.LENGTH_SHORT).show();

            }
        });

        String locationKey;
//        System.out.println(cities.get(0).getKey());
        locationKey=cities.get(0).getKey();

        return locationKey;

    }

    public Weather getWeatherData(String locationKey){
```

```
    //For Weather Data call


    //OkHttp Ligging inspector implementation
    OkHttpClient.Builder okHttpClientBuilder1=new OkHttpClient.Builder();
    HttpLoggingInterceptor loggingInterceptor1=new HttpLoggingInterceptor();

    //setting level to body
    loggingInterceptor1.setLevel(HttpLoggingInterceptor.Level.BODY);

    //adding inspector to builder
    okHttpClientBuilder1.addInterceptor(loggingInterceptor1);



    //creating retrofit builder
    Retrofit.Builder builder1=new Retrofit.Builder()
            .baseUrl("http://dataservice.accuweather.com/forecasts/v1/daily/5day/")
            .addConverterFactory(GsonConverterFactory.create())
            .client(okHttpClientBuilder1.build());

    Retrofit retrofit1=builder1.build();

    WeatherAPI weatherAPI=retrofit1.create(WeatherAPI.class);

    Call<Weather> weatherCall=weatherAPI.getWeatherData(locationKey);

    weatherCall.enqueue(new Callback<Weather>() {
        @Override
        public void onResponse(Call<Weather> call, Response<Weather> response) {
            weather=response.body();
            Toast.makeText(WeatherActivity.this, "Frtching Weather Data",Toast.LENGTH_SHORT).show();
        }

        @Override
        public void onFailure(Call<Weather> call, Throwable t) {
            Toast.makeText(WeatherActivity.this,"Failed to get Weather data",Toast.LENGTH_SHORT).show();

        }
    });

    return weather;

  }

  public String fahrenheitToCelcius(Double value){
    double celcius=((value-32)*(5/9));
    return String.format("%.2f",celcius);
  }
}
```

ForecastActivity.java

```
package com.example.abhay.mausamaajkal;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.support.v7.widget.LinearLayoutManager;
import android.support.v7.widget.RecyclerView;
import android.widget.Toast;

import com.example.abhay.model.ForcastModel;

import java.util.ArrayList;

public class ForecastActivity extends AppCompatActivity {

  private RecyclerView recyclerView;
  private RecyclerView.Adapter forcastAdapter;

  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_forcast);

    ArrayList<ForcastModel> forcastModels=(ArrayList<ForcastModel>)
getIntent().getSerializableExtra("forcastData");

    if(forcastModels!=null) {
      recyclerView = (RecyclerView) findViewById(R.id.recyclerView);
      recyclerView.setHasFixedSize(true);
      recyclerView.setLayoutManager(new LinearLayoutManager(ForecastActivity.this));

      forcastAdapter = new ForecastActivityAdapter(forcastModels, this);
      recyclerView.setAdapter(forcastAdapter);
    }
    else {
      Toast.makeText(ForecastActivity.this,"Error in getting forcast data",Toast.LENGTH_SHORT).show();
    }

  }
}
```

ForecastActivityAdapter.java

```
package com.example.abhay.mausamaajkal;

import android.content.Context;
import android.support.annotation.NonNull;
import android.support.v7.widget.RecyclerView;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.TextView;

import com.example.abhay.model.ForcastModel;

import java.util.ArrayList;

public class ForecastActivityAdapter extends RecyclerView.Adapter<ForecastActivityAdapter.ViewHolder> {

  private ArrayList<ForcastModel> forcastModels;

  private Context context;

  public ForecastActivityAdapter(ArrayList<ForcastModel> forcastModels, Context context) {
    this.forcastModels = forcastModels;
    this.context = context;
  }

  public class ViewHolder extends RecyclerView.ViewHolder{
    private TextView txtDate,txtMaxTemp,txtMinTemp,txtMaxPhrase,txtMinPhrase;

    public ViewHolder(View itemView) {
      super(itemView);

      txtDate=(TextView)itemView.findViewById(R.id.txtDate);
      txtMaxTemp=(TextView)itemView.findViewById(R.id.txtMaxTempForcast);
      txtMinTemp=(TextView)itemView.findViewById(R.id.txtMinTempForcast);
      txtMaxPhrase=(TextView)itemView.findViewById(R.id.txtMaxPhraseForcast);
      txtMinPhrase=(TextView)itemView.findViewById(R.id.txtMinPhraseForcast);

    }
  }



  @NonNull
  @Override
  public ViewHolder onCreateViewHolder(@NonNull ViewGroup parent, int viewType) {

    View view=LayoutInflater.from(parent.getContext())
        .inflate(R.layout.weather_data_list,parent,false);
    return new ViewHolder(view);
  }

  @Override
  public void onBindViewHolder(@NonNull ViewHolder holder, int position) {
        ForcastModel model=forcastModels.get(position);
        holder.txtDate.setText(model.getDate());
        holder.txtMaxPhrase.setText(model.getMaxTempPhrase());
        holder.txtMinPhrase.setText(model.getMinTempPhrase());
        holder.txtMaxTemp.setText(model.getMaxTemp());
        holder.txtMinTemp.setText(model.getMinTemp());

    }

    @Override
    public int getItemCount() {
        return forcastModels.size();
    }
}
```

Activity_weather.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".WeatherActivity"
    android:background="@drawable/after_noon">


    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical">

        <TextView
            android:id="@+id/textView"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:gravity="center"
            android:text="Mausam Aaj Kal"
            android:textColor="@color/text1"
            android:textSize="45sp"
            android:textStyle="bold" />

        <EditText
            android:id="@+id/edtCityName"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:ems="10"
            android:gravity="center"
            android:hint="Enter your city"
            android:inputType="textPersonName"
            android:textSize="25sp"                                                  />

        <Button
            android:id="@+id/btnSend"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_gravity="center_horizontal"
            android:text="Get"                                                       />

        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="250dp"
            android:orientation="horizontal">

            <LinearLayout
                android:layout_width="0dp"
                android:layout_height="match_parent"
                android:layout_weight="50"
                android:orientation="vertical">

                <TextView
                    android:id="@+id/textView2"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:gravity="center"
                    android:text="Maximum                                    Temperature"
                    android:textSize="22sp"                                          />

                <TextView
                    android:id="@+id/txtMaxTemp"
                    android:layout_width="wrap_content"
                    android:layout_height="wrap_content"
                    android:layout_gravity="center"
                    android:layout_marginTop="25dp"
                    android:gravity="center"
                    android:text="26.20°C"
                    android:textSize="45sp"                                          />

                <TextView
                    android:id="@+id/txtMaxPhrase"
                    android:layout_width="wrap_content"
                    android:layout_height="wrap_content"
                    android:layout_gravity="center"
                    android:layout_marginTop="20dp"
                    android:gravity="center"
                    android:text="Cloudy"
                    android:textSize="25sp"                                          />
            </LinearLayout>

            <LinearLayout
                android:layout_width="0dp"
                android:layout_height="match_parent"
                android:layout_weight="50"
                android:orientation="vertical">
                <TextView
                    android:id="@+id/textView3"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:gravity="center"
                    android:text="Minimum temperature"
                    android:textSize="22sp" />

                <TextView
                    android:id="@+id/txtMinTemp"
                    android:layout_width="wrap_content"
                    android:layout_height="wrap_content"
                    android:layout_gravity="center"
                    android:layout_marginTop="25dp"
                    android:gravity="center"
                    android:text="14.55°C"
                    android:textSize="45sp" />

                <TextView
                    android:id="@+id/txtMinPhrase"
                    android:layout_width="wrap_content"
                    android:layout_height="wrap_content"
                    android:layout_gravity="center"
                    android:layout_marginTop="20dp"
                    android:gravity="center"
                    android:text="Foggy"
                    android:textSize="25sp" />
              </LinearLayout>
            </LinearLayout>

            <Button
              android:id="@+id/btnNextFiveDay"
              android:layout_width="wrap_content"
              android:layout_height="wrap_content"
              android:layout_gravity="center"
              android:text="5-Day Forcast" />
          </LinearLayout>
        </RelativeLayout>
```

Activity_weather.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:app="http://schemas.android.com/apk/res-auto"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".ForecastActivity"
  android:background="@drawable/after_noon">
  <LinearLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent"
```

```
        android:orientation="vertical">
        <TextView
            android:id="@+id/textViewTitle"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:gravity="center"
            android:text="Mausam Aaj Kal"
            android:textColor="@color/text1"
            android:textSize="45sp"
            android:textStyle="bold" />

        <android.support.v7.widget.RecyclerView
            android:id="@+id/recyclerView"
            android:scrollbars="vertical"
            android:layout_width="match_parent"
            android:layout_height="match_parent">

        </android.support.v7.widget.RecyclerView>

    </LinearLayout>



</RelativeLayout>
```

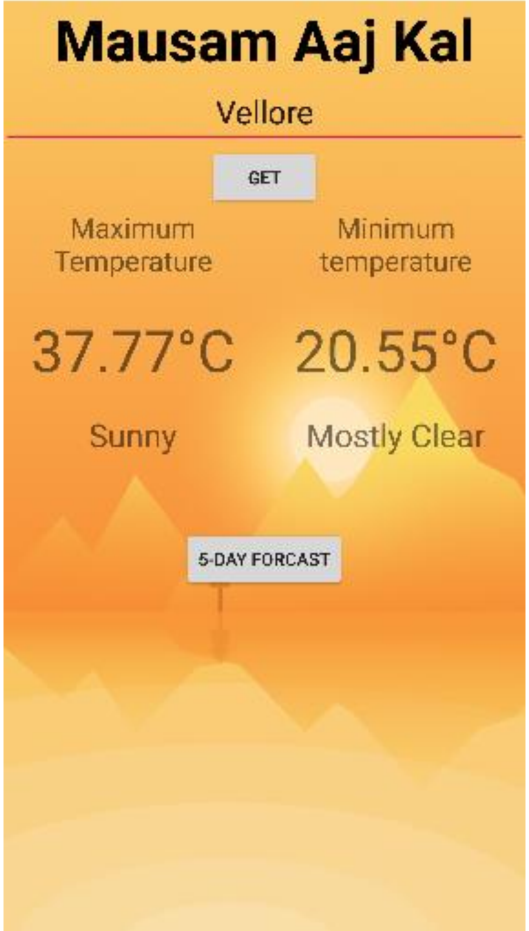
Weather_data_list.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent" android:layout_height="wrap_content">

    <android.support.v7.widget.CardView
        android:layout_margin="10dp"
        android:layout_width="match_parent"
        android:layout_height="wrap_content">
        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:orientation="vertical">
            <TextView
                android:id="@+id/txtDate"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="2019-01-27"
                android:textSize="25sp"
                android:layout_gravity="center_horizontal"/>


            <LinearLayout
```

```
android:layout_width="match_parent"
android:layout_height="250dp"
android:orientation="horizontal">


<LinearLayout
    android:layout_width="0dp"
    android:layout_height="match_parent"
    android:layout_weight="50"
    android:orientation="vertical">

    <TextView
        android:id="@+id/textView2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:gravity="center"
        android:text="Maximum Temperature"
        android:textSize="22sp" />

    <TextView
        android:id="@+id/txtMaxTempForcast"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:layout_marginTop="25dp"
        android:gravity="center"
        android:text="32°C"
        android:textSize="45sp" />

    <TextView
        android:id="@+id/txtMaxPhraseForcast"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:layout_marginTop="20dp"
        android:gravity="center"
        android:text="Sunny"
        android:textSize="25sp" />
</LinearLayout>

<LinearLayout
    android:layout_width="0dp"
    android:layout_height="match_parent"
    android:layout_weight="50"
    android:orientation="vertical">

    <TextView
        android:id="@+id/textView3"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:gravity="center"
        android:text="Minimum temperature"
        android:textSize="22sp" />

    <TextView
```

```
                        android:id="@+id/txtMinTempForcast"
                        android:layout_width="wrap_content"
                        android:layout_height="wrap_content"
                        android:layout_gravity="center"
                        android:layout_marginTop="25dp"
                        android:gravity="center"
                        android:text="18°C"
                        android:textSize="45sp"                                                                                  />

                    <TextView
                        android:id="@+id/txtMinPhraseForcast"
                        android:layout_width="wrap_content"
                        android:layout_height="wrap_content"
                        android:layout_gravity="center"
                        android:layout_marginTop="20dp"
                        android:gravity="center"
                        android:text="Cool                                                                                 Breeze"
                        android:textSize="25sp"                                                                                  />
                </LinearLayout>
            </LinearLayout>


        </LinearLayout>



    </android.support.v7.widget.CardView>

</RelativeLayout>
```

1.5 Output Screen

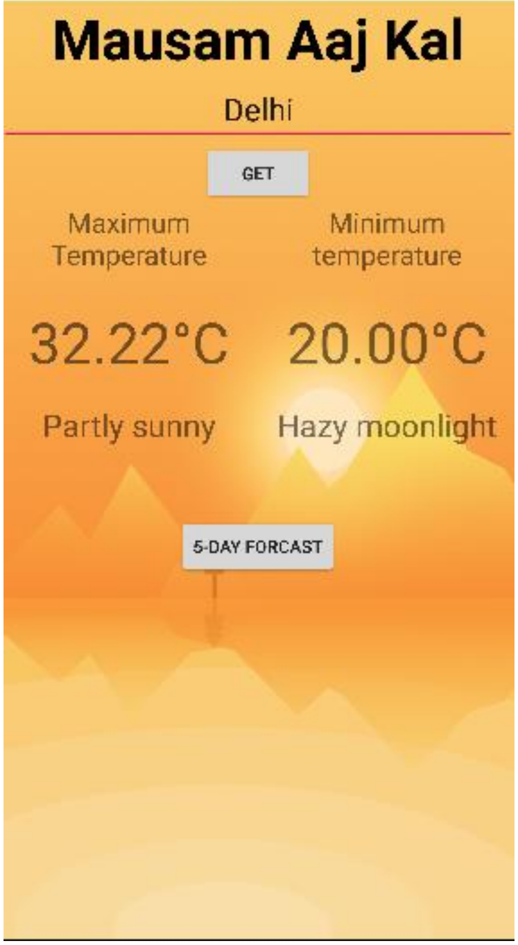


Mausam Aaj Kal

Vellore

Maximum Temperature: 37.77°C, Sunny

Minimum temperature: 20.55°C, Mostly Clear



Mausam Aaj Kal

Delhi

Maximum Temperature: 32.22°C, Partly sunny

Minimum temperature: 20.00°C, Hazy moonlight

1.6 Conclusion:

This App will help to get the current weather data and also help in getting the next five-day data of any city of the world.

1.7 References:

https://developer.accuweather.com/apis