

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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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.

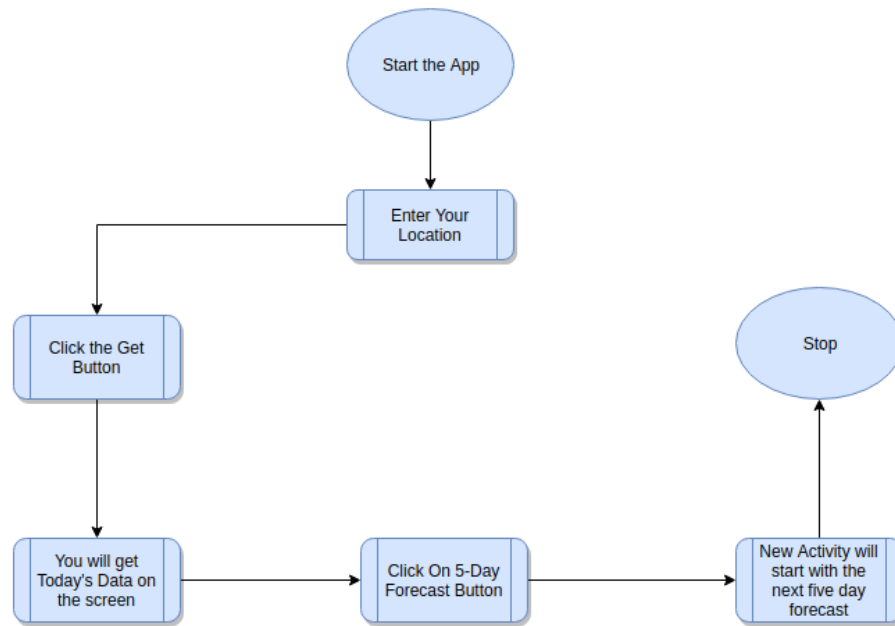
1.2 INTRODUCTION

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



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.ForecastModel;
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<ForecastModel> forecastModels=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();
            ForecastModel model=new ForecastModel(date,maxTemp,minTemp,maxTempPhrase,minTempPhrase);
            forecastModels.add(model);
        }

        //        progressDialog.dismiss();

        Intent intent=new Intent(WeatherActivity.this,
            ForecastActivity.class).putExtra("forecastData",forecastModels);

        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 Logging 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.ForecastModel;

import java.util.ArrayList;

public class ForecastActivity extends AppCompatActivity {

    private RecyclerView recyclerView;
    private RecyclerView.Adapter forecastAdapter;

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

        ArrayList<ForecastModel> forecastModels=(ArrayList<ForecastModel>)
        getIntent().getSerializableExtra("forecastData");

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

            forecastAdapter = new ForecastActivityAdapter(forecastModels, this);
            recyclerView.setAdapter(forecastAdapter);
        }
        else {
            Toast.makeText(ForecastActivity.this, "Error in getting forecast 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.ForecastModel;

import java.util.ArrayList;

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

    private ArrayList<ForecastModel> forecastModels;

    private Context context;

    public ForecastActivityAdapter(ArrayList<ForecastModel> forecastModels, Context context) {
        this.forecastModels = forecastModels;
        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.txtMaxTempForecast);
            txtMinTemp=(TextView)itemView.findViewById(R.id.txtMinTempForecast);
            txtMaxPhrase=(TextView)itemView.findViewById(R.id.txtMaxPhraseForecast);
            txtMinPhrase=(TextView)itemView.findViewById(R.id.txtMinPhraseForecast);

        }
    }

    @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) {

```

```

ForecastModel model=forecastModels.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 forecastModels.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 Forecast" />
</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/txtMaxTempForecast"
    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/txtMaxPhraseForecast"
    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/txtMinTempForecast"
        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/txtMinPhraseForecast"
            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



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>