

Nimbus Application

A Weather App Developed in XML and JAVA

Project Documentation

By  
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**Overview**

The Nimbus Weather App is an Android application that provides users with current weather information, forecasts for the next few days, and related details such as sunrise/sunset times, probabilities of rain, wind speed, humidity, pressure, UV index, and visibility. The app uses the OpenWeatherMap API to fetch weather data based on the user's location.

**Project Structure**

The project consists of the following key components:

1. **Manifest File (AndroidManifest.xml):** The manifest file describes the essential information about the app to the Android system.

**Key Elements:**

<uses-permission>: Declares the permissions the app requires, such as `ACCESS\_FINE\_LOCATION`, `ACCESS\_COARSE\_LOCATION`, and `INTERNET`.

<application>: Contains metadata about the application, including the icon, label, theme, and activities.

<activity>: Declares the activities that make up the app's user interface: `Splash`, `Home`, and `Aboutus`.

<intent-filter>: Specifies the entry point of the application (the `Splash` activity in this case).

<meta-data>: Includes metadata such as the Google Maps API key.

**2. Layout Files:**

**a. Splash Screen Layout (splash.xml):** Defines the layout for the splash screen, typically displaying the app logo and name.

**b. Home Screen Layout (home.xml):**  Defines the main layout for the home screen, displaying weather information, location details, and forecast summaries.

**Key Components:**

1. **TextView:** Display weather data such as temperature, location, date, time, and weather conditions.
2. **ImageViews:** Display weather icons and other visual elements.
3. **CardViews:** Organize and group related information, such as daily forecasts.
4. **ConstraintLayout:** Provides a flexible layout structure for arranging UI elements.

**c. About Us Layout (aboutus.xml):** Defines the layout for the "About Us" screen, typically displaying information about the app developers or a brief description of the app.

**3. Java Source Files:**

**a. Splash Activity (Splash.java):** The splash activity is displayed when the app is launched. It typically shows a logo and performs initial setup tasks before navigating to the main activity.

**Key Functionality:**

1. Displays the splash screen layout (`splash.xml`).
2. Uses a `Handler` to delay navigation to the `Home` activity.
3. Starts the `Home` activity after a specified delay (2 seconds in this case).
4. Finishes the `Splash` activity to prevent the user from returning to it.

**b. Home Activity (Home.java):**  The main activity of the app, responsible for displaying weather information, handling location updates, and managing user interactions.

**Key Functionality:**

1. Initializes UI elements and sets up click listeners.
2. Uses `FusedLocationProviderClient` to get the user's location.
3. Uses `Geocoder` to convert location coordinates to address information (city, state, country).
4. Uses Retrofit to fetch weather data from the OpenWeatherMap API.
5. Updates UI elements with weather data, including temperature, location, date, time, and weather conditions.
6. Handles permission requests for location access.
7. Provides forecast summaries for the next few days.
8. Displays sunrise/sunset times and animates the sun/moon position.
9. Includes methods for updating the UI based on the selected day (previous, current, or next).
10. Includes methods for updating weather probabilities (rain, wind, humidity, pressure, UV, visibility).

**c. About Us Activity (Aboutus.java):**  Displays information about the app.

**Key Functionality:**

1. Displays the "About Us" layout (`aboutus.xml`).

**4. Resources:**

**a. String Resources (strings.xml):** Defines string resources used throughout the app, such as app name, API keys, and UI labels.

**Key Elements:**

1. <string *name*="weather\_api\_key">your string api key</string>

(API KEY Link - https://home.openweathermap.org/api\_keys

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**5. Gradle Build Files:**

**a. *Dependencies (external added)*:** Specifies the dependencies required by the app, such as libraries and external modules.

**Key Elements:**

1. *implementation* ("com.google.android.gms:play-services-location:21.2.0")
2. *implementation* ("com.squareup.retrofit2:retrofit:2.9.0")
3. *implementation* ("com.squareup.retrofit2:converter-gson:2.9.0")