# My preferred cities weather

Orlando Macedo - up202103400@fe.up.pt
Hugo Almeida - up202103394@fe.up.pt
Sadra Farshid - up202001957@fe.up.pt

## Introduction

It was proposed the implementation of a Flutter application that would allow the consultation of weather forecasts.

It was used the OpenWeather API as a complement in order to populate the application with weather related data. This API has various endpoints allowing fetch not only the current weather state but also fetch the forecast in the next days for a specific location/city. All data returned is in JSON format and was analyzed and filtered to be displayed accordingly in the Flutter application.

## Architecture

The architecture for this application is relatively simple. As mentioned before, all data is provided from the public API OpenWeather API to extract information related to weather conditions. The information retrieved is previously parsed into objects which are accessed by Widgets to be rendered when the application runs. Beyond this, the localstorage was used to store the cities which the user has a greatest interest in. Hereupon, it is possible to save the favorite cities in the mobile device and load them whenever the application runs.

The following figure resumes the architecture of the solution.

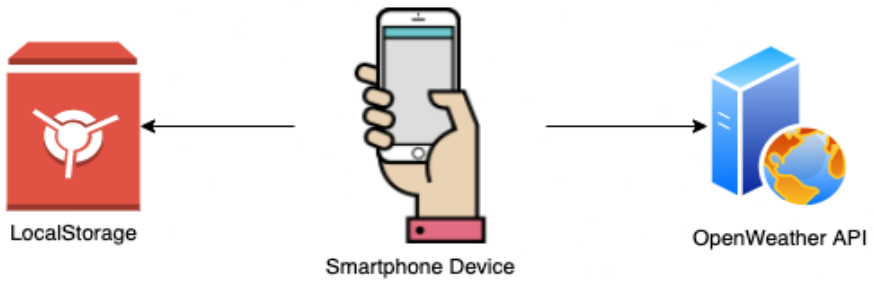



Fig. 1 - Architecture of the solution

### Interaction with API

As mentioned above, the OpenWeather API allows fetching different contexts of data. For the project purpose, it was used the following main services available in 2.5 version:

| | **Endpoints** |
|---|---|
| **Current Weather Data** | `https://api.openweathermap.org/data/2.5/weather?<parameters>` |
| **Hourly Forecast 4 days** | `https://api.openweathermap.org/data/2.5/forecast?<parameters>` |

### Models

There were created models in order to parse the responses returned by API into Dart Objects. The API response was filtered and only several fields considered important within the problem context were parsed to objects.

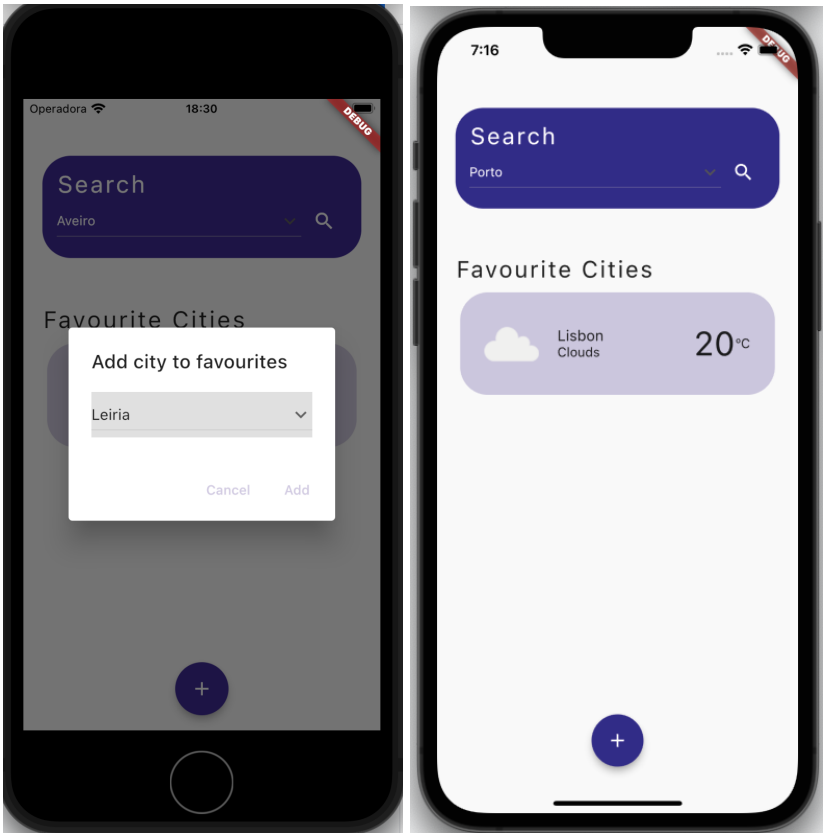
The `Weather` object is the main object which contains the following information: city, latitude, longitude, weather description, weather icon, visibility, temperature, wind, other information and date. As temperature and wind retrieved information presents several elements, two more different objects were created: `Temperature` object and `Wind` object. While the `Temperature` object gathers the current temperature, min and max temperatures, pressure, humidity and sensation temperature data, the `Wind` object stores the speed, degree and gust.

Another model (`Forecast`) was implemented in order to associate a list of forecast weather to a specific city.

# Features

- **Add cities to favorites and check the weather information.**

  To accomplish this, there is an add floating action button at the bottom of the applications first screen. By tapping on it, a dialog appears allowing the user to select a city. After concluding the add process, the city will appear on the home screen of the application under the Favorite Cities section.

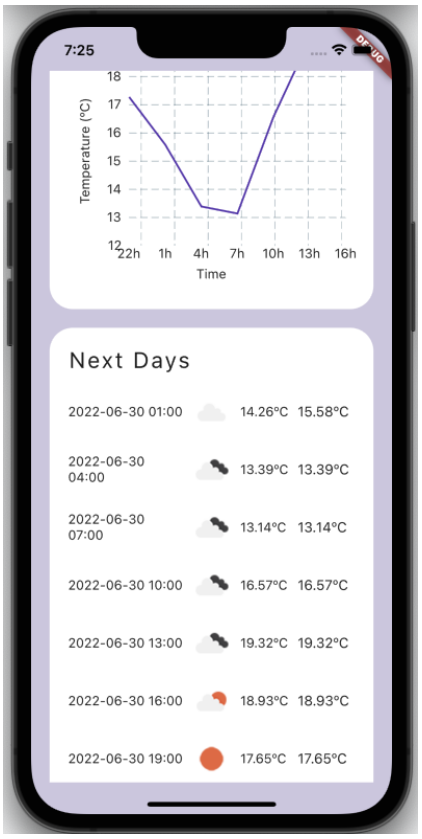


- **Remove cities from the favorites list.**

  By swiping the card of the city to the left, a Remove button appears on the right side of the card. By tapping on this button, the city will be removed and the favorite cities list will updat.

- **Check weather details for a city:**

  By tapping on one of the cities under the Favorite Cities, the application navigates to the weather detail screen, where the user can obtain more information regarding the current weather condition, and also regarding the weather forecast.


The details demonstrated on the details screen is as follows:

- general weather condition is demonstrated using pictures on the top of the screen, so the user rapidly knows the current weather condition.
- The current temperature is displayed on the top of the screen.
- Minimum and maximum temperature for the day
- Humidity is demonstrated using a graph.
- Visibility
- Temperature evolution throughout the day is demonstrated using a graph.
- General weather conditions with minimum and maximum temperature for the next 5 days is demonstrated in a list.

- **Search weather information for a specific Portugal district.**

  At the top of the screen, there is a search bar, where the user can search for a specific city to see the weather information.