

# Mobile Computing

## Practical Assignment #2 / Design and Development

### Cities weather

#### 1. Minimum scenario

An organization wants to provide an application for weather data consultation.

In this app the user maintains a record of the cities he is interested in, among the **district capitals of Portugal**. In any time, he can add or remove cities from this list.

Also, from the list of those particularly interesting cities the user can ask for the current weather conditions of a city, obtaining information perhaps about temperature, pressure, precipitation, wind, and humidity. The app also should display an icon characterizing those conditions.

Another feature is to show to the user a forecast of the next day, for the same city, but on a separate panel or page. Also, small images, characterizing the conditions along the day, can optionally be shown near the time of day.

Other feature is to show, in a graphical form, the evolution of some meteorological characteristics along the last week, for some city of the short list.

You can add any features to this minimum specification that you feel useful.

#### 2. Design and development

Information about the weather conditions in most of the world cities can be obtaining calling an external web service. A free one supplying the required information can be subscribed at the Visual Crossing Weather site:

[https:// www.visualcrossing.com](https://www.visualcrossing.com)

which has more information about the available APIs and free and paid subscriptions.

After a free subscription, you are entitled to several requests with a supplied API key.

The several APIs and responses are described in:

<https://www.visualcrossing.com/resources/documentation/weather-api/timeline-weather-api>

For instance, to obtain the current conditions in JSON format, in a city, you can use the REST call:

<https://weather.visualcrossing.com/VisualCrossingWebServices/rest/services/timeline/Viseu,PT/2025-04-29?include=days,current&key=<YOUR-API-KEY>>

with a JSON response similar to:

```
{"queryCost":1,"latitude":40.657,"longitude":-7.91463,"resolvedAddress":"Viseu, Portugal","address":"Viseu,PT","timezone":"Europe/Lisbon","tzoffset":1.0,"days":[{"datetime":"2025-04-29","datetimeEpoch":1745881200,"tempmax":74.2,"tempmin":55.7,"temp":64.5,"feelslike max":74.2,"feelslikemin":55.7,"feelslike":64.5,"dew":50.0,"humidity":60.3,"precip":0.0,"precipprob":19.4,"precipcover":0.0,"preciptype":null,"snow":0.0,"snowdepth":0.0,"windgust":29.1,"windspeed":13.2,"winddir":151.8,"pressure":1009.7,"cloudcover":81.5,"visibility":15.0,"solarradiation":275.5,"solarenergy":23.8,"uvindex":9.0,"seve
```

```

rerisk":10.0,"sunrise":"06:32:51","sunriseEpoch":1745904771,"sunset":"20:25:54","sunsetEpoch":1745954754,"moonphase":0.06,"conditions":"Partially cloudy",
"description":"Partly cloudy throughout the day.,"icon": "partly-cloudy-day","stations":["remote"],"source":"comb"}], "stations":{"D1912":{"distance":53389.0,"latitude":40.291,"longitude":-7.507,"useCount":0,"id":"D1912","name":"DW1912 Covilhae PT", "quality":0,"contribution":0.0},"LPOV":{"distance":66092.0,"latitude":40.9,"longitude":-8.63,"useCount":0,"id":"LPOV","name":"LPOV", "quality":28,"contribution":0.0},"E9353":{"distance":29631.0,"latitude":40.455,"longitude":-7.686,"useCount":0,"id":"E9353","name":"EW9353 Seia PT", "quality":0,"contribution":0.0}}, "currentConditions":{"datetime":"08:00:00","datetimeEpoch":1745910000,"temp":59.1,"feelslike":59.1,"humidity":60.3,"dew":45.4,"precip":0.0,"precipprob":0.0,"snow":0.0,"snowdepth":0.0,"preciptype":null,"windgust":12.7,"windspeed":6.3,"winddir":87.0,"pressure":1009.0,"visibility":6.2,"cloudcover":100.0,"solarradiation":51.0,"solarenergy":0.2,"uvindex":1.0,"conditions":"Overcast","icon":"cloudy", "stations":["D1912","LPOV","E9353"],"source":"obs","sunrise":"06:32:51","sunriseEpoch":1745904771,"sunset":"20:25:54","sunsetEpoch":1745954754,"moonphase":0.06}}

```

or other similar API calls (you have free 1000 queryCost per day).

It is also possible to obtain forecast weather conditions, and many others.

To obtain an icon name and description include the query parameter iconSet=icons2 (more detailed and complete). You can obtain and pre download a set of icon images, corresponding to icon descriptions, in <https://github.com/visualcrossing/WeatherIcons>

If you can find one, you can also use any other free weather information web service, instead.

You can use this service directly or through your own REST service (with perhaps a more convenient API and response) as an intermediary.

The app should be developed using Flutter.

### 3. Report

You should write a report describing all the features, architecture, interface, and the testing performed in your app. You should include also an **illustrated** (with screen captures) guide of the use cases supported by your app.