

Flutter weather app

Second Assignment - Mobile Computing

Jorge Laguna - up202111636@fe.up.pt

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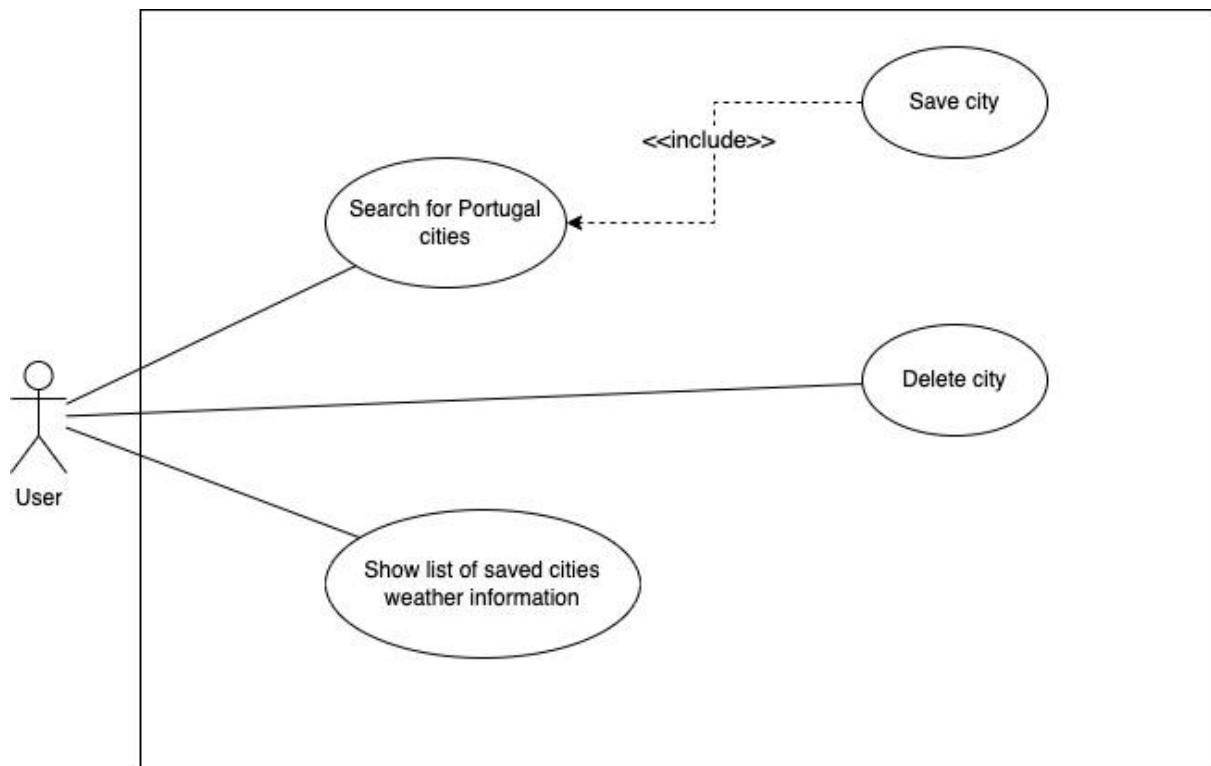
Functional requirements

1. The system should be able to provide information about the weather in Portugal
2. The system should be able to let the user search a place in Portugal and save it locally
3. The system should be able to show weather information of all the saved list of cities: week forecast, day forecast, current temperature and weather condition, pressure, humidity, UVI factor, visibility, etc.
4. The system should be able to let the user delete the cities from the saved list of cities

Non-functional requirements

1. The weather information should be obtained from [openweathermap API](#)
2. The system should not recover any personal information of the user
3. The search function should count on auto completion provided by [Google Places API](#)
4. The maximum amount of saved cities should be 5
5. The list of saved cities should be stored in with SharedPreferences API
6. There should be a representation of the current weather condition in a city with images, depending on the city
7. The weather information of the saved cities should be shown through a scroll tab navigation bar.

Use cases diagram



The use cases diagram in this case is pretty trivial.

Storage design

Shared Preferences

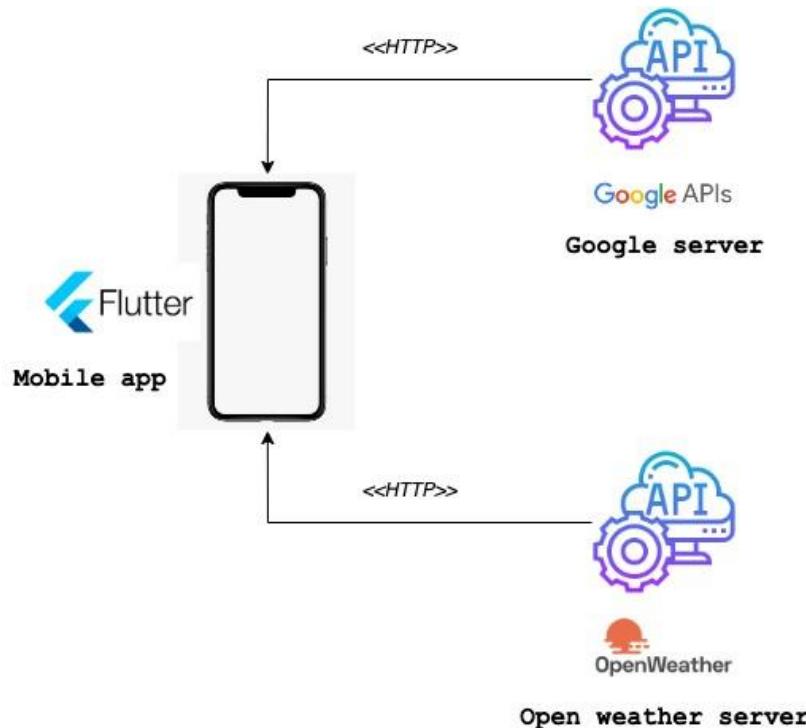
City	
description	string
latitude	number
longitude	number
background	string

In this case, the local storage of the mobile phones is used: SharedPreferences. “description” refers to the complete direction of a city (e.g *Porto, Portugal*); “latitude” and “longitude” refers to the geolocation of the city; “background” refers to the image url used in the screen background depending on the weather condition (Windy, Clear, Stormy...).

As there is no formal database, no further configuration is required. The data is encoded in JSON and it is not encrypted because it is not personal or confidential information.

System design

Architecture diagram

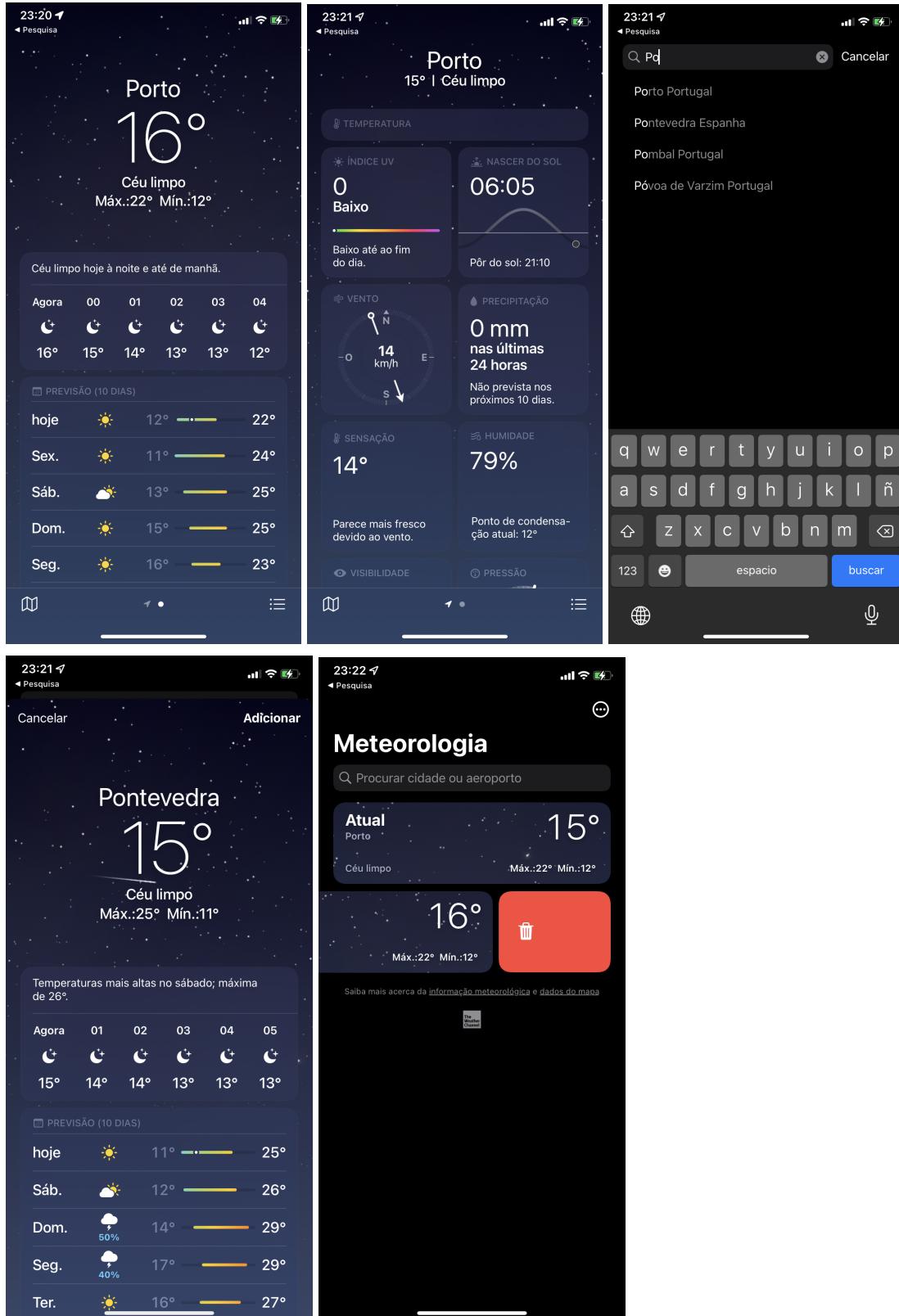


For the mobile application, the Flutter framework is used, which is executed in native code, so it is very fast compared to other frameworks like Ionic or Apache Cordova. Basically, the architecture of the application is an hexagonal one, which makes the services scalable in time, if the application gets bigger and changes to other technologies. The Redux pattern is used to manage the global state (in this case the list of saved cities) with a custom error boundary to prevent unexpected errors. More about the architecture in <https://github.com/FEUP-practices/flutter-weather-app#architecture>.

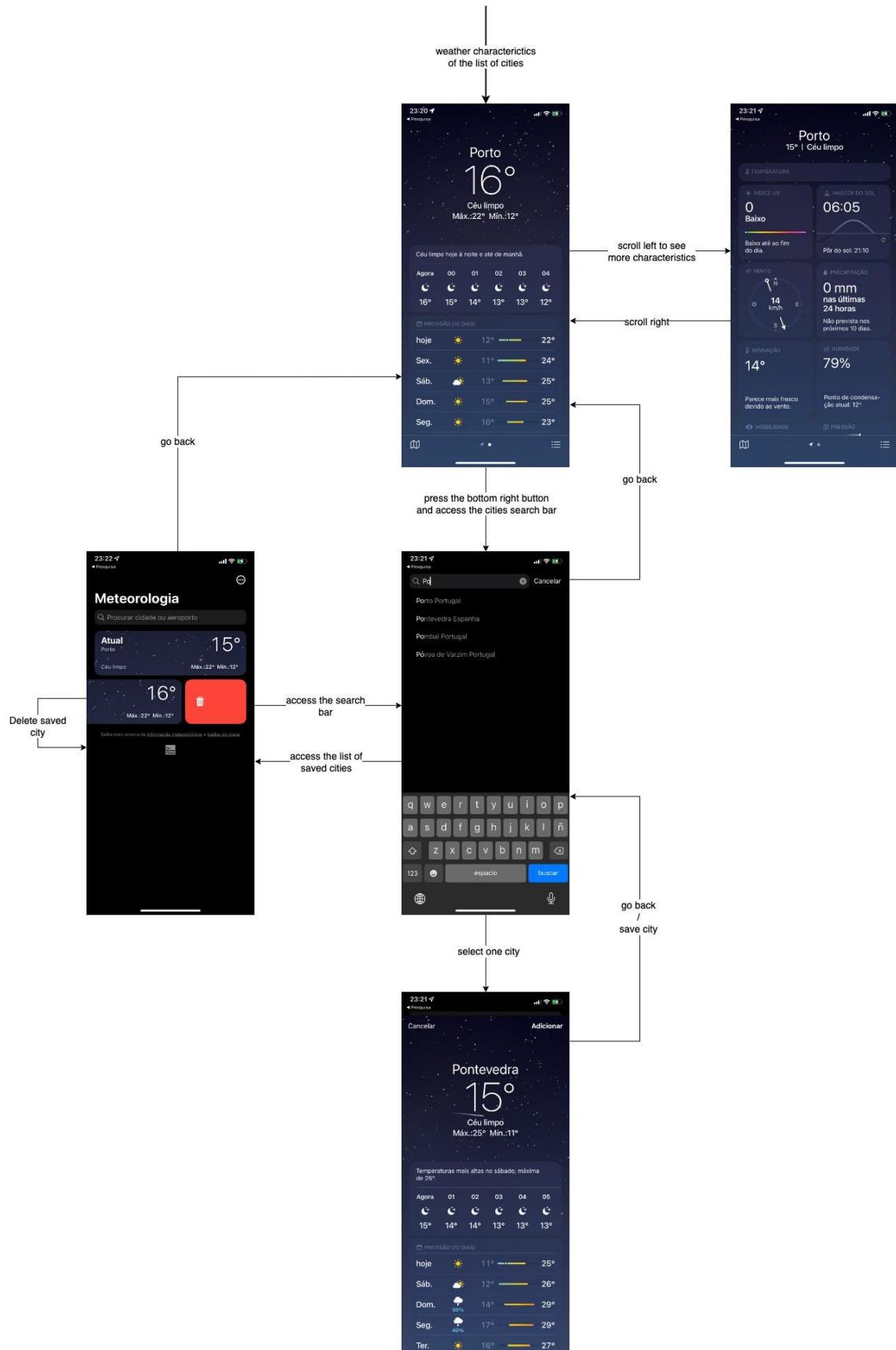
The Google API is used for obtaining information about the places that exists in Portugal and the geolocation of these cities, in order to, eventually, get the information about the weather in these cities, through the Open weather map API.

Screens

The application design is highly inspired by the [iOS weather app](#), obviously making a less complicated prototype. The photos below are extracted from the iOS weather app.

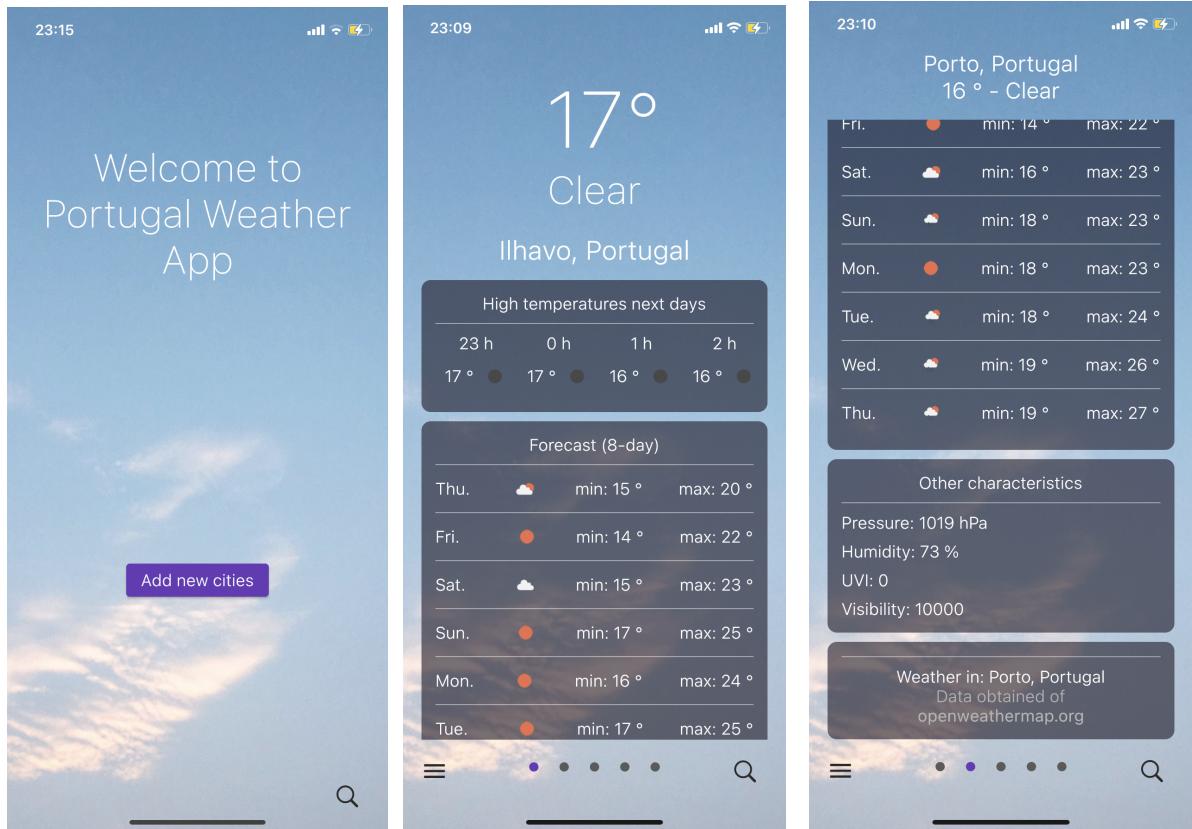


Navigation map



Final screens

The next screens are captured in an iPhone XR.



The first screenshot shows the main weather screen for Ponta Delgada, Portugal, displaying a 8-day forecast and other characteristics. The second screenshot shows a search results page for 'por' (Portugal) with various city suggestions. The third screenshot shows an 'Add new city' dialog with a keyboard and an 'Add' button.

Ponta Delgada, Portugal
20 ° - Clouds

Forecast (8-day)

Day	Icon	Temp (min)	Temp (max)
Thu.	Cloudy with rain	17 °	22 °
Fri.	Cloudy with rain	20 °	22 °
Sat.	Cloudy with rain	19 °	22 °
Sun.	Cloudy with rain	19 °	21 °
Mon.	Cloudy with rain	18 °	20 °
Tue.	Cloudy with rain	19 °	21 °
Wed.	Cloudy with rain	18 °	22 °
Thu.	Cloudy with rain	19 °	23 °

Other characteristics

- Pressure: 1027 hPa
- Humidity: 88 %
- UVI: 0
- Visibility: 10000

23:10

23:10

23:10

Search bar: por

Porto, Portugal

Portimão, Portugal

Portalegre, Portugal

Porto Moniz, Portugal

Porto de Mós, Portugal

Add new city

Accept button: aceptar

Keyboard: q, w, e, r, t, y, u, i, o, p, a, s, d, f, g, h, j, k, l, ñ, 123, espacio, Add button, 0

The screenshot shows a detailed weather forecast for Angra do Heroísmo, Portugal, including a 24-hour high temperatures chart, an 8-day forecast, and a delete option.

20 °
Drizzle

Angra do Heroísmo, Portugal

High temperatures next days

Time	Temp (min)	Temp (max)
23 h	20 °	20 °
0 h	20 °	20 °
1 h	20 °	20 °
2 h	20 °	20 °

Forecast (8-day)

Day	Icon	Temp (min)	Temp (max)
Thu.	Cloudy with rain	17 °	21 °
Fri.	Cloudy with rain	19 °	21 °
Sat.	Cloudy with rain	18 °	21 °
Sun.	Cloudy with rain	18 °	20 °
Mon.	Cloudy with rain	16 °	20 °
Tue.	Cloudy with rain	18 °	20 °

Delete

23:14

In the end, comparing it to the designed screens, they are pretty similar. The final app hasn't as many features as the original but it has the basics. Cities can be deleted more conveniently, by an expandable bottom sheet dialog. An autocomplete search has also been implemented in order to make a better user experience.

Performed tests

All tests are manually made. They are specified in
<https://github.com/FEUP-practices/flutter-weather-app#testing>.

Bugs

All bugs are registered in
<https://github.com/FEUP-practices/performances-app/blob/main/README.md#bugs>.

Performance

The performance report is under
<https://github.com/FEUP-practices/flutter-weather-app#performance>.

Notes

The only security added in this application comes because of the two API keys generated by the developer (me), so an environment file (.env) is used in the root of the project so the keys are protected. As the API used is public and there is no server involved or confidential information no more security is required so far.