

# Predicting Air Quality for Outdoor Activities

## Challenge Provider: Cascais City Hall

Just over 20 minutes from the capital Lisbon and its international airport, Cascais is a municipality bordered by a waterfront that opens doors to the endless Atlantic Ocean. With about 214,000 inhabitants and a territory of 97.4 km<sup>2</sup>, a third of which in Parque Natural, Cascais is proud of its treasures and its people. In the more than 500 years of history since our formation, we have known how to preserve tradition and respect the past, but innovate and evolve, seeking in technology a cosmopolitanism that makes our life more comfortable, safer and, at the same time, more environmentally friendly. Today, as before the pandemic, we offer history, culture, sport and nature. There are many places where without concentration of people and in complete safety, we can take advantage of unique landscapes, of equipment as only in Cascais you can find.

## Context

Since 2020, Cascais has been implementing an amount of air quality sensors. This air quality system aims to monitor what's happening in Cascais and identify areas where there's a need to act and improve air quality while improving and creating better experiences for its inhabitants.

We need a model that considers the data collected from the system, in correlation with other infrastructure, to identify the best nearby spots in each neighbourhood to spend family time, practice sport, enjoy green areas, or eat outside.

## Goals

Based on the data collected and its analysis, we would like to have a tool that allows citizens to plan outdoor activities regarding the air quality.

## Outcome

This problem has several layers that can be tackled, starting from a fundamental solution to something more advanced:

1. A daily predictive model for the air quality of the city of Cascais;
2. Explanation of the prediction of the air quality and possible measures for reducing it, specifically in the areas where outdoor activities are performed;
3. Suggest outdoor activities depending on the predicted air quality.

## Available Resources

The challenge can be solved by using Open Data from the city of Cascais or any other city. All the data is available on the Open Data Portal. The data dictionary and links can be found here: <https://bit.ly/wdl-data>

## QART:

Air quality measurements from sensors from 11 sensors, recording daily averages starting from 01/03/2021.

**Outdoor POIs:**

- Playgrounds
- Green Areas
- Gardens
- City Parks
- Beaches
- Water Lines
- Water Sports
- Sports in the Nature
- Sports Infrastructure

## Submissions

**Deadline:** 29 - 05 - 2021 @ 14h00 GMT + 1

Don't forget that you will need to deliver the report **using the template provided** (see below) and a 1-minute summary.

Submission template: <http://bit.ly/wdl-template>

## Tips

- Don't forget to research all the different measures of air quality and why they are essential. Which measure is the most relevant for the end-user? (Find [additional information](#) about the adopted policy for monitoring air quality in Cascais)
- You can use other data sources, such as weather, which can be very useful (find information about complementary weather measurements in Cascais [here](#));
- If possible, don't forget to explain the predictions of your model.