

# Smart City App

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## Contributors

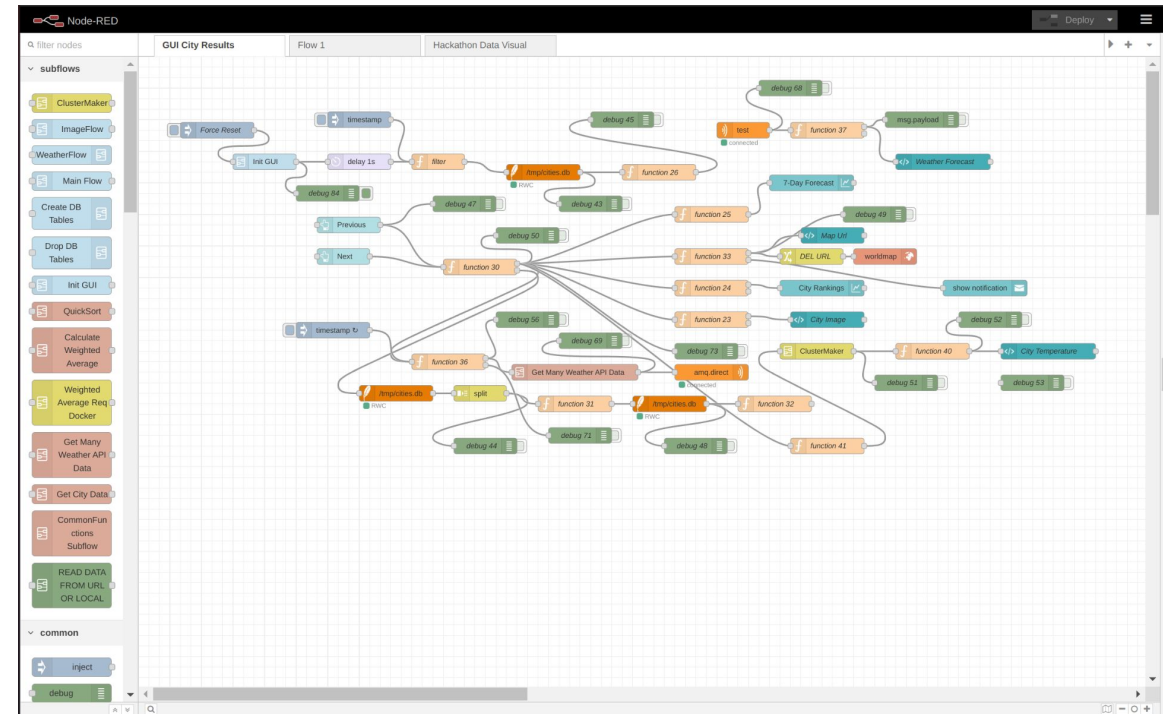
- [Manousos Linardakis](#), it22064
- [Christos Kazakos](#), it22033

# Project Description

This project displays weather, ranking and location data from 70+ countries (and their available cities)!

## Feats:

- Aggregation of 4 different weather APIs.
- Data Visualization.
- Complex Subflows.
- Hackathon Submission.





# Main APIs Used

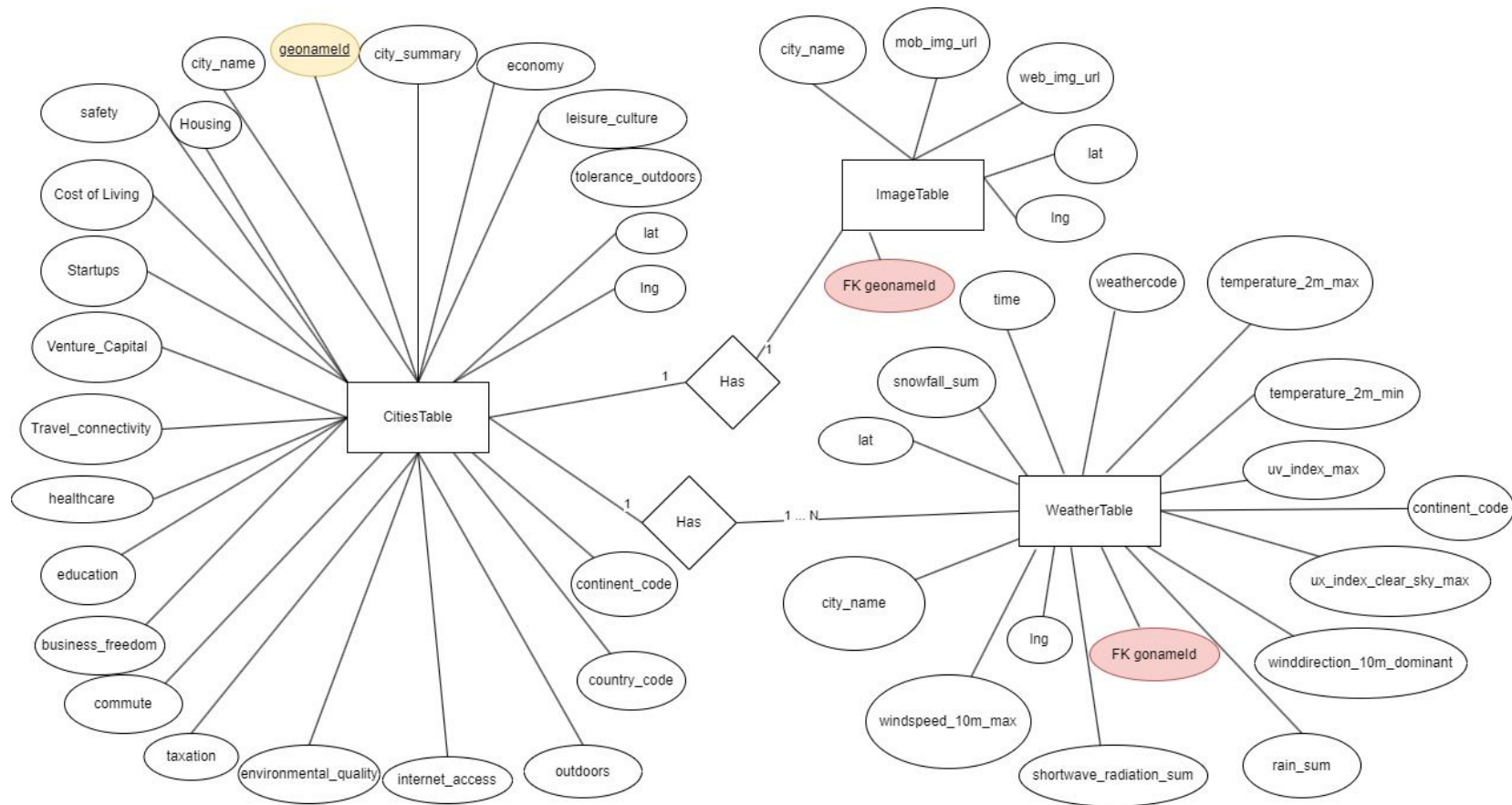
Description	API	Input	Output
Used to get the cities of a requested country.	<a href="https://www.geonames.org/">https://www.geonames.org/</a>	country code, geonames_username	cities (of the country code)
The API endpoint forecast accepts a geographical coordinate, a list of weather variables and responds with a JSON weather forecast for 7 days.	<a href="https://open-meteo.com/">https://open-meteo.com/</a>	geographical coordinate (lat, lon), time interval (hourly, daily, ...), list of weather variables that they are interested in ( <a href="#">see this link</a> )	temperature, weather (in general like rain, wind, humidity, soil, etc)
Gets the quality of life of a requested city.	<a href="https://developers.teleport.org/api/getting_started/#life_quality_ua">https://developers.teleport.org/api/getting_started/#life_quality_ua</a>	city_name	Quality of life (education, environmental quality, etc – <a href="#">Life Quality Data for Cities</a> )
Gets a photo of a requested city.	<a href="https://developers.teleport.org/api/getting_started/#photos_ua">https://developers.teleport.org/api/getting_started/#photos_ua</a>	city_name	Photos of cities ( <a href="#">City Photos</a> )
Openweathermap API	<a href="https://openweathermap.org/current">https://openweathermap.org/current</a>	api key, latitude, longitude	Current weather data for a city



# APIs Used for Aggregation

API	Input	Output
<a href="https://www.weatherapi.com/docs/">https://www.weatherapi.com/docs/</a>	Latitude, Longitude, API key	Current Weather data for given latitude, longitude.
<a href="https://docs.tomorrow.io/reference/realtime-weather">https://docs.tomorrow.io/reference/realtime-weather</a>	Latitude, Longitude, API key	Current Weather data for given latitude, longitude.
<a href="https://api.open-meteo.com/v1/forecast?latitude=52.52&amp;longitude=13.41&amp;current_weather=true">https://api.open-meteo.com/v1/forecast?latitude=52.52&amp;longitude=13.41&amp;current_weather=true</a>	Latitude, Longitude, API key	Current Weather data for given latitude, longitude.
<a href="https://openweathermap.org/current">https://openweathermap.org/current</a>	Latitude, Longitude, API key	Current Weather data for given latitude, longitude.

# ER Diagram



For a better view of the ER diagram, please refer to this [link](#).



# K-means Clustering

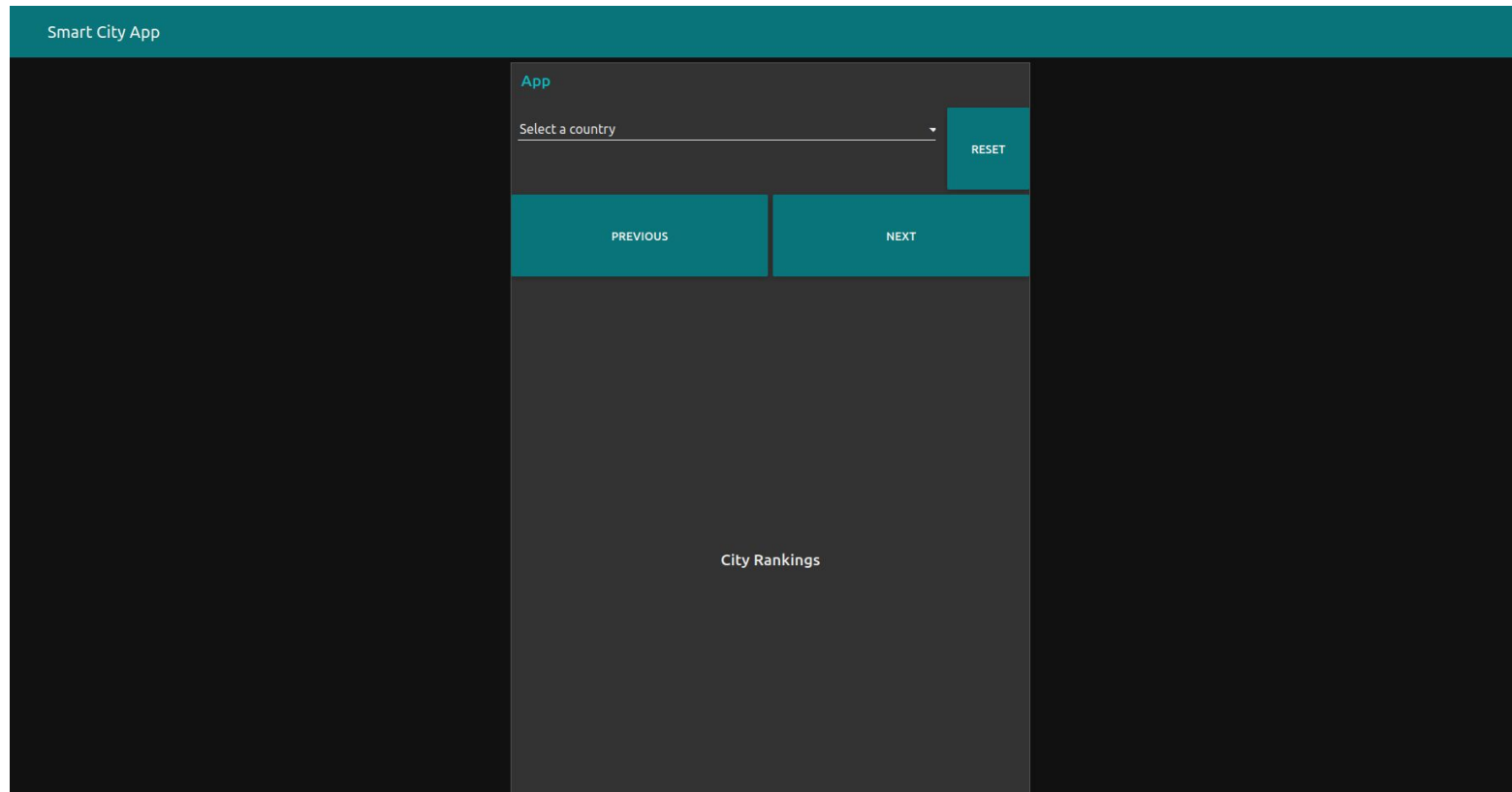
We implemented K-means clustering for grouping temperatures in the database.

Example Output in GUI:

This city has **middle** temperature than other cities in database.

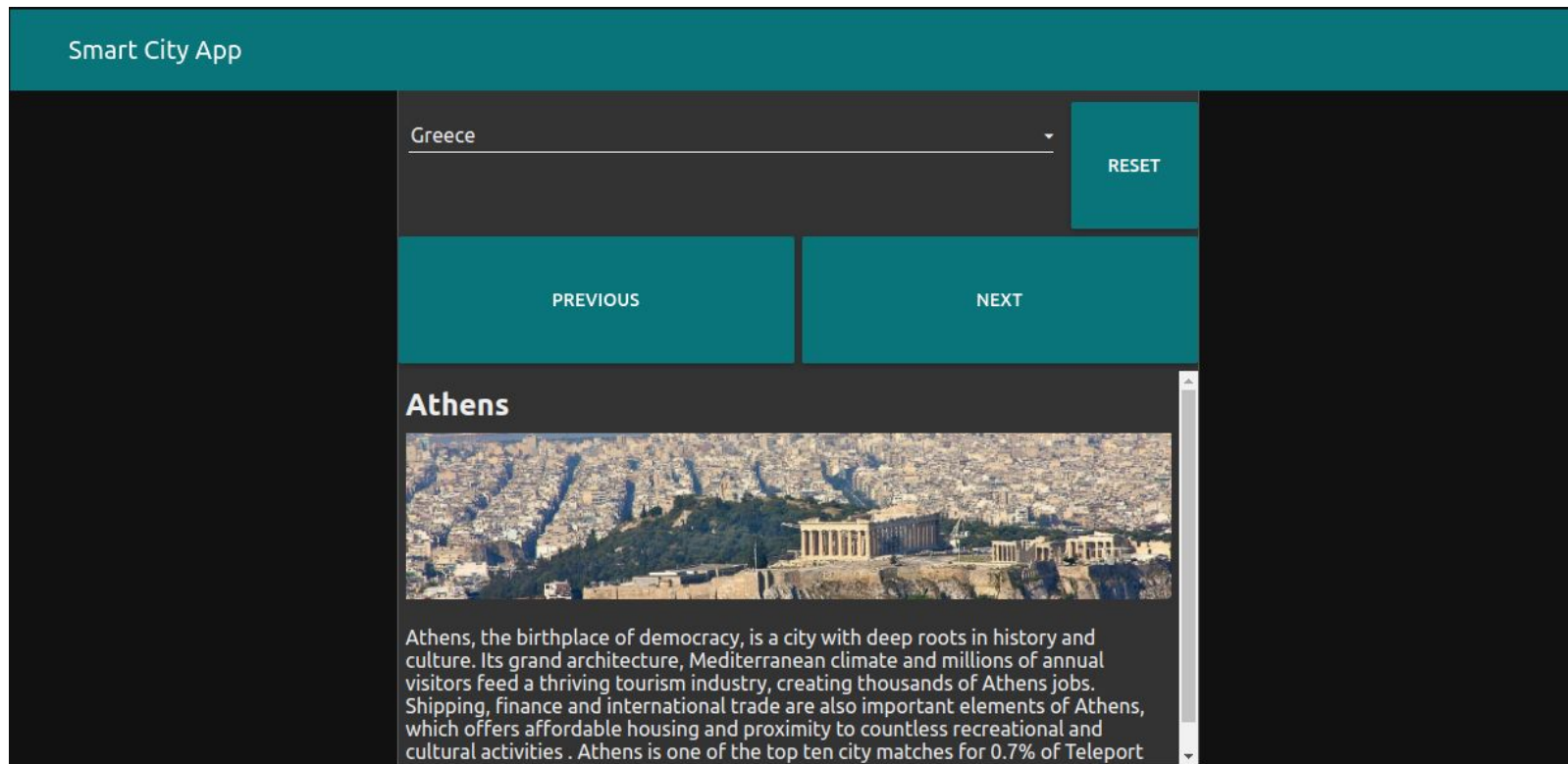


# GUI Showcase



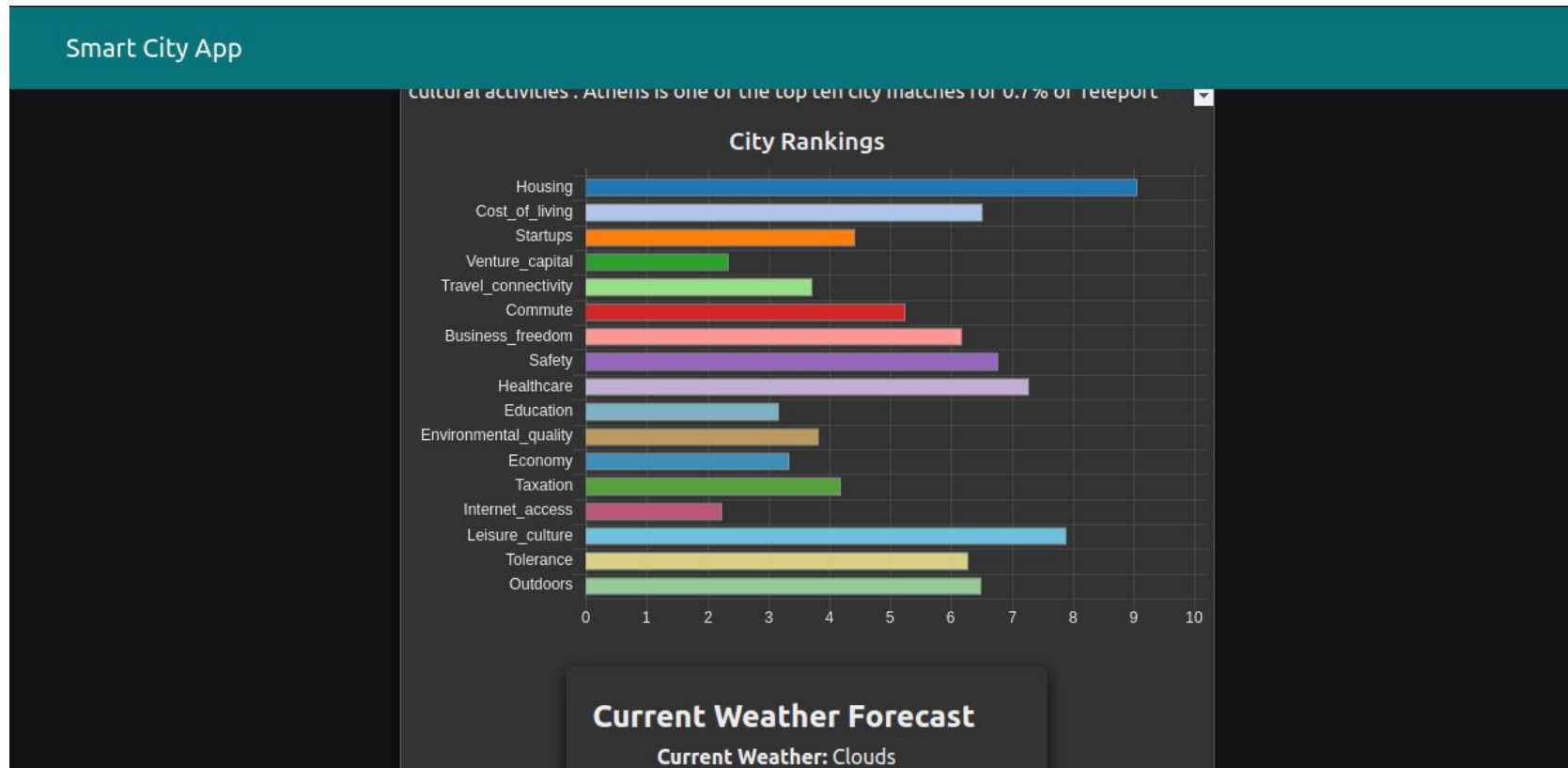


# GUI Showcase



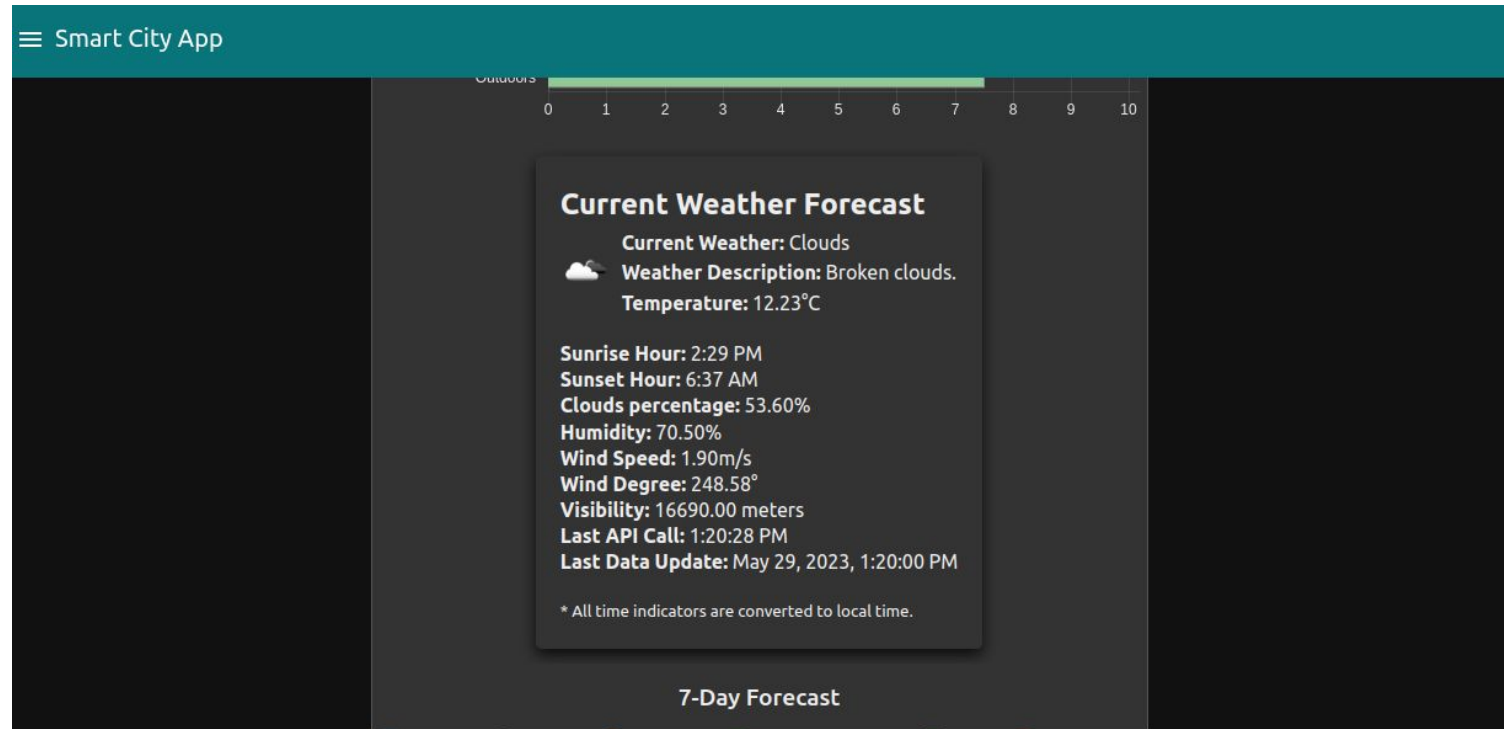


# GUI Showcase

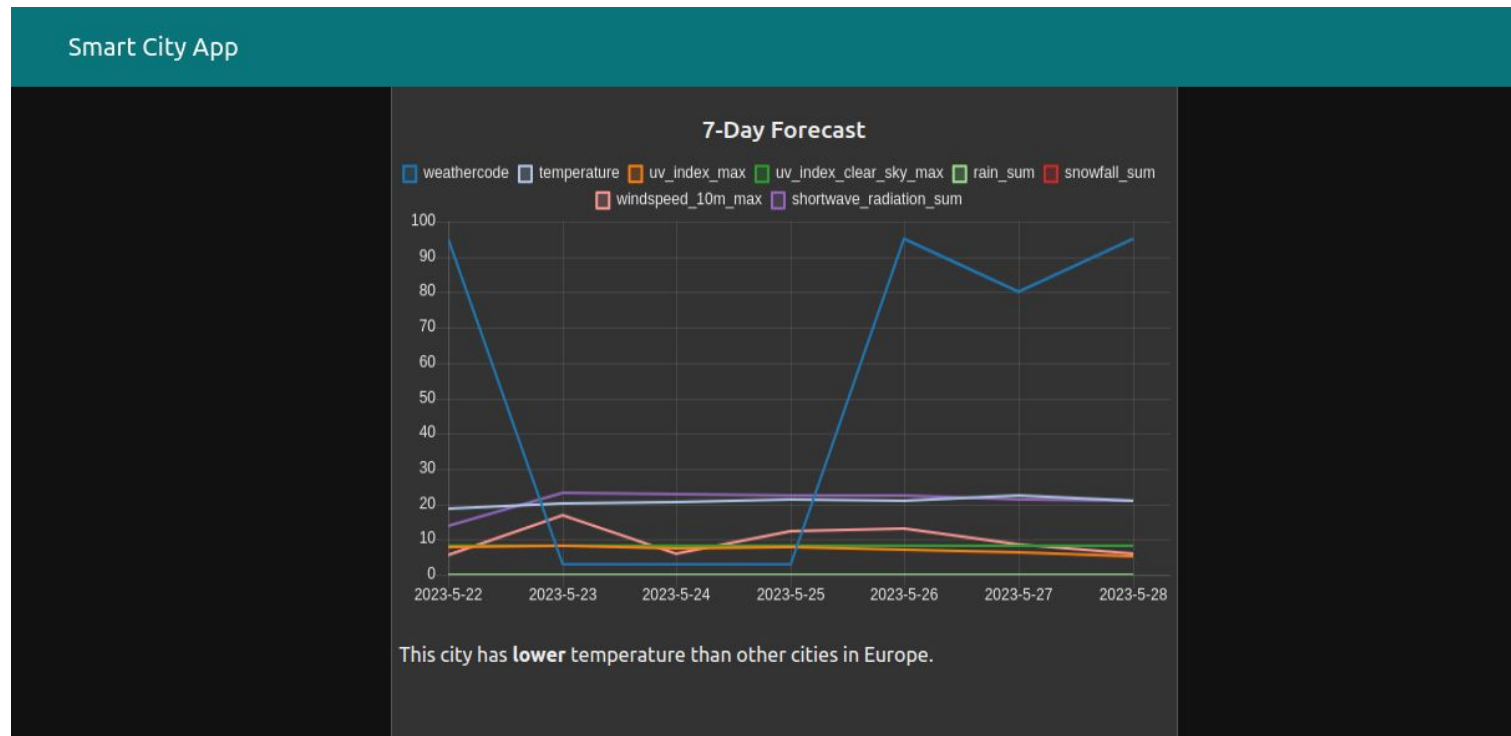




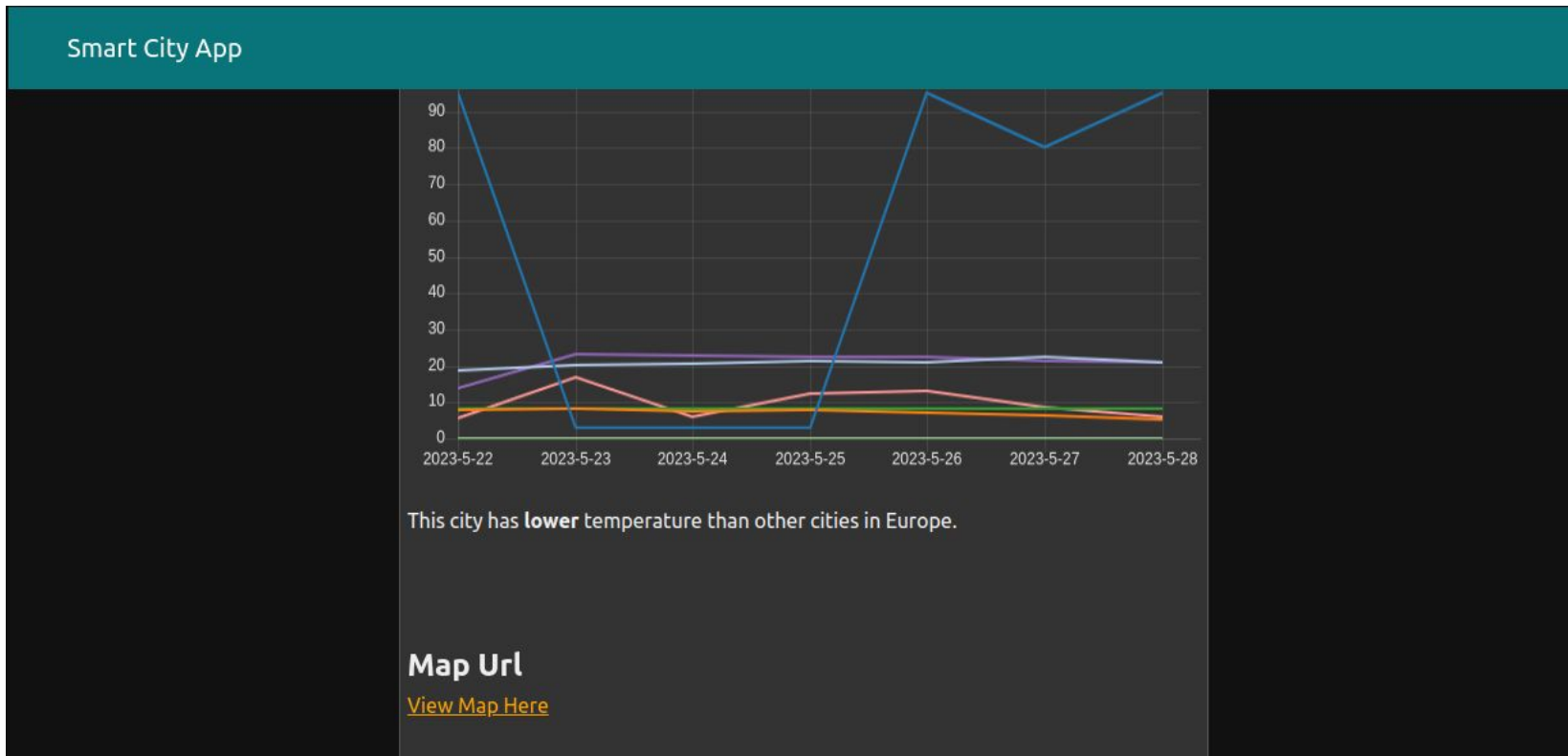
# GUI Showcase



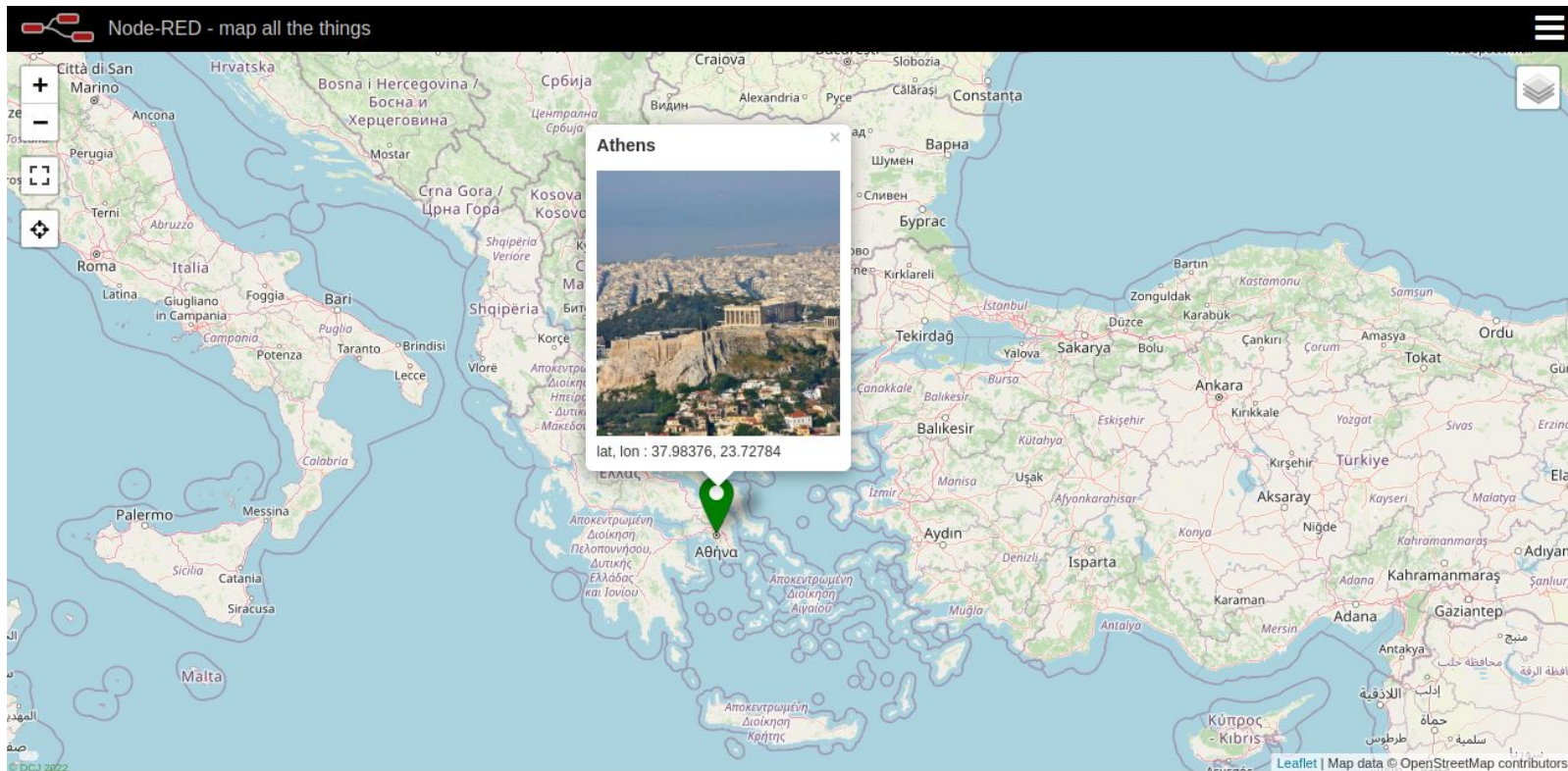
# GUI Showcase



# GUI Showcase



# GUI Showcase



# Participation in 2nd PHYSICS Hackathon 2023

You can view our devpost submission with our solutions to all the hackathon challenges [here](#).

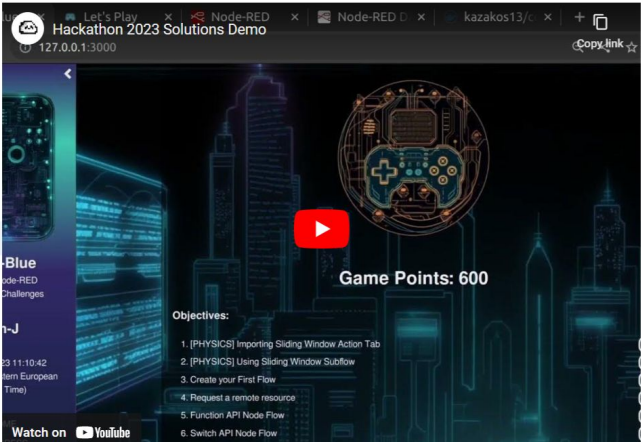
## 2nd PHYSICS Hackathon 2023 Challenge

Solutions to the 2nd Hackathon PHYSICS Challenges 2023.

[Like](#) [Comment](#)

STORY

UPDATES



[Edit project](#)

**SUBMITTED TO**  
2nd PHYSICS Hackathon

**CREATED BY**  
Describe your contribution  
Ex: I worked on the back-end. It was my first time using Node, which was a little intimidating, but I learned a lot.  
[Save](#) [Cancel](#)  
Manousos Linardakis

## 2nd PHYSICS Hackathon 2023 Subflows

This is a collection with all the subflows we implemented for the 2nd PHYSICS Hackathon 2023.

### Collection Info

7 things  
Updated 2 days ago  
Rating: *not yet rated*

### Owners

manouslinard

### Actions

Rate: ☆ ☆ ☆ ☆ ☆

### Get City Info Subflow

This subflow gets data for a specific city name. To input the city name you can set it on the UI of this node or in msg.city\_name (message will be passed to the subflow).

manouslinard flow

### Many Weather API Subflow

This subflow calculates the weighted averages of weather information from multiple weather APIs to provide a more precise estimation of the weather.

manouslinard flow

### Weighted Average Request

This subflow communicates with the URL provided in the UI to run the Weighted Average Common Function. By default, it uses a Docker container.

manouslinard flow

### Weighted Average

This subflow calculates the weighted average of given values, considering the date of each value. The more recent the date, the higher the value.

manouslinard flow

### Quicksort Request

This subflow communicates with the URL provided in the UI (can be changed in the 'FUNCTIONS\_URL' attribute), which by default is 'https://api.openweathermap.org/data/2.5/weather?q={city\_name}&appid={api\_key}'.

manouslinard flow

### QuickSort Subflow

This project implements the Quick Sort algorithm, which can perform both normal and reverse sorting based on the chosen option (to be implemented).

manouslinard flow

### Common Functions Subflow, Openwhisk

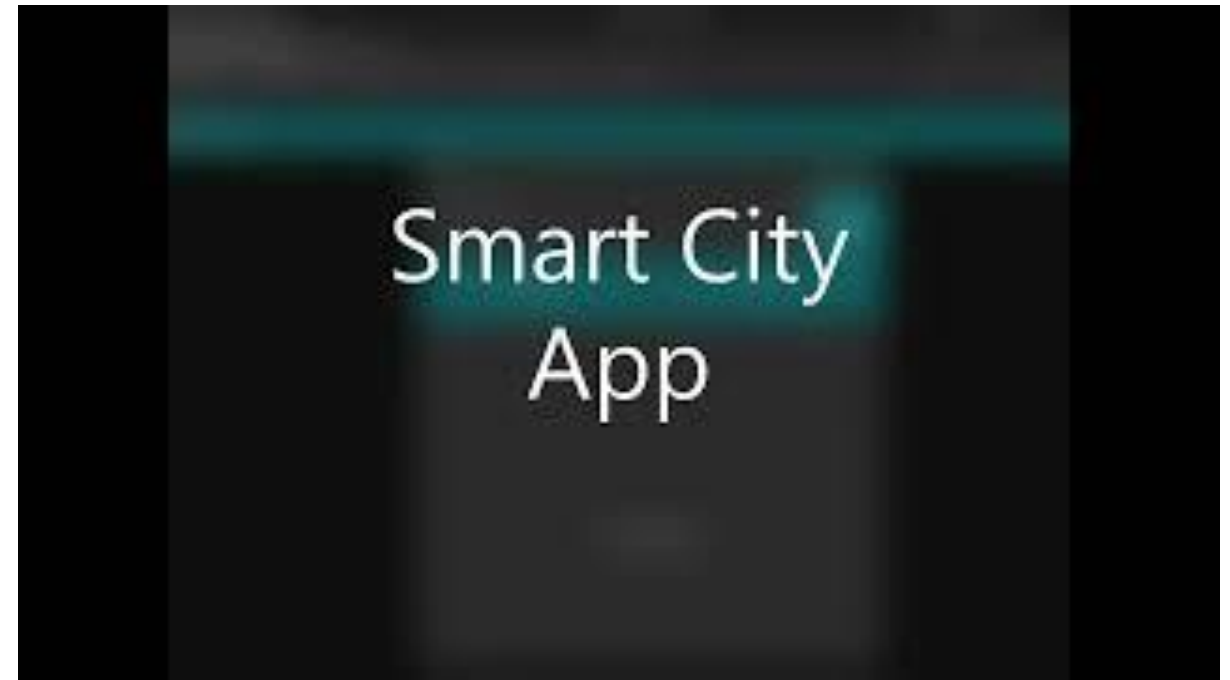
This subflow is the one used in the following Docker image: kazakos13/common-functions.

manouslinard flow



## Source Code (& other links)

- [Github Repository](#)
- [Project Documentation](#)
- [2nd PHYSICS Hackathon 2023 Submission](#)
- [Node-red Subflow Collection](#)
- [Hackathon Solutions Presentation](#)





The background of the slide is a dark, atmospheric night scene of a city skyline. In the foreground, numerous light trails from vehicles on a highway or bridge curve towards the horizon, creating a sense of motion. Above the city, vertical streaks of light in blue, purple, and white, resembling digital data or particle effects, rise into the dark sky. The overall color palette is dominated by deep blues and blacks, with highlights from the city lights and light trails.

# Thank you for your time!

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