Uniwersytet Wrocławski

Weather Assistant

Introduction to cloud computing

24/25

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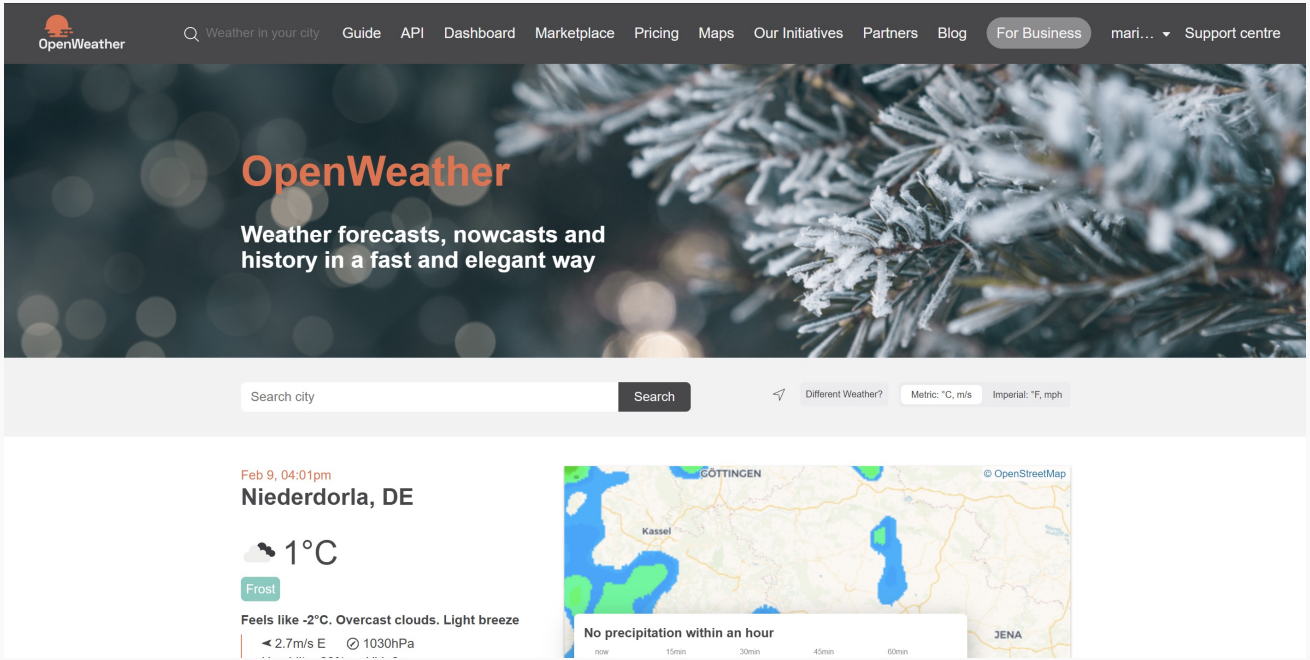
Project Idea

- **Real-time weather chatbot** that enables users to **query** current weather information**.**
- How it works:
  - **User input**: User enters location and asks about a specific weather condition (e.g., "*What's the temperature like in Porto?*" or "*I want to know the humidity in Wrocław?*")
  - **Backend**: Serverless function fetches and processes weather data from an API.
  - **Output**: The assistant responds with current weather conditions.

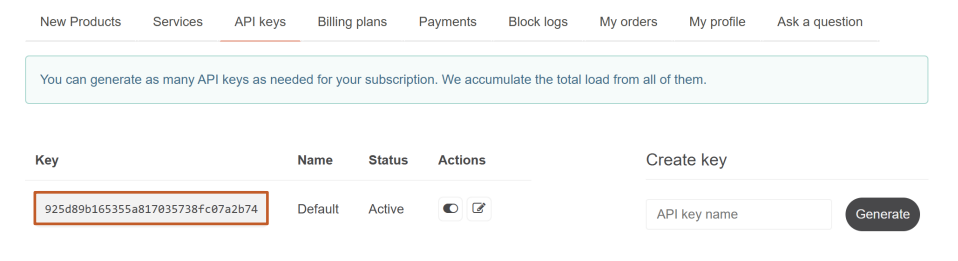
Services

Service	Purpose
OpenWeatherMap	Fetch real-time weather data
Kommunicate.io	Integrate bot into website.
AWS Lambda	Process queries and generate responses
AWS S3	Host the frontend
AWS Lex	Create and manage the chatbot interface

OpenWeatherMap API



OpenWeatherMap API



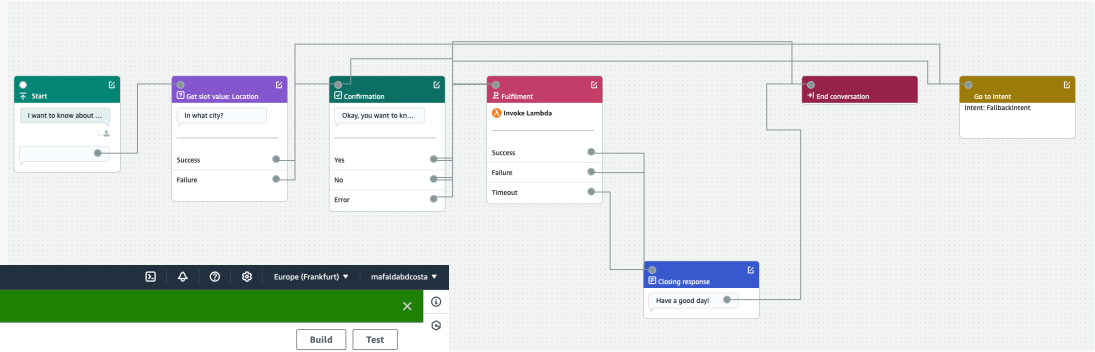
JSON format API response fields

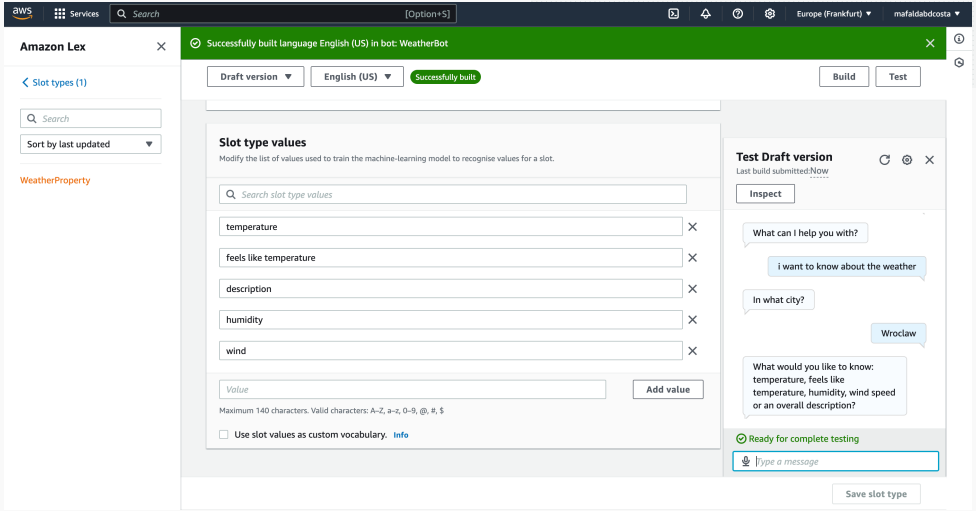
- `coord`
  - `coord.lon` Longitude of the location
  - `coord.lat` Latitude of the location
- `weather` (more info Weather condition codes)
  - `weather.id` Weather condition id
  - `weather.main` Group of weather parameters (Rain, Snow, Clouds etc.)
  - `weather.description` Weather condition within the group. Please find more here. You can get the output in your language. Learn more
  - `weather.icon` Weather icon id
- `base` Internal parameter
- `main`
  - `main.temp` Temperature. Unit Default: Kelvin, Metric: Celsius, Imperial: Fahrenheit
  - `main.feels_like` Temperature. This temperature parameter accounts for the human perception of weather. Unit Default: Kelvin, Metric: Celsius, Imperial: Fahrenheit
  - `main.pressure` Atmospheric pressure on the sea level, hPa
  - `main.humidity` Humidity, %
  - `main.temp_min` Minimum temperature at the moment. This is minimal currently observed temperature (within large megalopolises and urban areas). Please find more info here. Unit Default: Kelvin, Metric: Celsius, Imperial: Fahrenheit
  - `main.temp_max` Maximum temperature at the moment. This is maximal currently observed temperature (within large megalopolises and urban areas).

AWS Lambda Function

```
const getWeather = (lat, lon, property) => new Promise((resolve, reject) => {
    const apiKey = process.env.OPENWEATHER_API_KEY;
    if (!apiKey) return reject("API key is missing");

    const options = {
        hostname: 'api.openweathermap.org',
        path: `/data/2.5/weather?lat=${lat}&lon=${lon}&appid=${apiKey}&units=metric`,
        method: 'GET',
    };

    const req = https.request(options, res => {
        let data = '';
        res.on('data', chunk => data += chunk);
        res.on('end', () => {
            try {
                const weatherData = JSON.parse(data);
                if(property == "description"){
                    resolve(weatherData.weather.description);
                }
                else if(property == "feels_like"){
                    resolve(weatherData.main.feels_like);
                }
                else if(property == "humidity"){
                    resolve(weatherData.main.humidity);
                }
                else if(property == "wind"){
                    resolve(weatherData.wind.speed);
                }
                else{
                    resolve(weatherData.main.temp);
                }
            } catch (error) {
                reject(`Failed to parse response: ${error.message}`);
            }
        });
    });

    req.on('error', error => reject(`Request error: ${error.message}`));
    req.end();
});

```

AWS Lex


Start
I want to know about ...
Get slot value: Location
In what city?
Success
Failure
Confirmation
Okay, you want to kn...
Yes
No
Error
Fulfilment
Invoke Lambda
Success
Failure
Timeout
End conversation
Go to intent
Intent: FallbackIntent
Closing response
Have a good day!


aws
Services
Search
[Option+S]
Europe (Frankfurt)
mafaldabdcosta
Amazon Lex
Slot types (1)
Search
Sort by last updated
WeatherProperty
Successfully built language English (US) in bot: WeatherBot
Draft version
English (US)
Successfully built
Build
Test
Slot type values
Modify the list of values used to train the machine-learning model to recognise values for a slot.
Search slot type values
temperature
feels like temperature
description
humidity
wind
Value
Add value
Maximum 140 characters. Valid characters: A–Z, a–z, 0–9, @, #, $
Use slot values as custom vocabulary. Info
Test Draft version
Last build submitted: Now
Inspect
What can I help you with?
i want to know about the weather
In what city?
Wroclaw
What would you like to know: temperature, feels like temperature, humidity, wind speed or an overall description?
Ready for complete testing
Type a message
Save slot type

Simple Interface

```
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1" />
    <title>Weather Assistant</title>
    <link rel="stylesheet" href="style.css" />
    <link rel="icon" type="image/x-icon" href="img/favicon.ico" />
    <script type="text/javascript">
        (function(d, m){
            var kommunicateSettings =
                {"appId":"106d6542039303d1bfd64de70ccb40d23","popupWidget":true,"automaticChatOpenOnNavigation":true};
            var s = document.createElement("script"); s.type = "text/javascript"; s.async = true;
            s.src = "https://widget.kommunicate.io/v2/kommunicate.app";
            var h = document.getElementsByTagName("head")[0]; h.appendChild(s);
            window.kommunicate = m; m._globals = kommunicateSettings;
        })(document, window.kommunicate || {});
    </script>
</head>

<body>
    <h1><img src="images/weather-icon.png" alt="weather" />Weather Assistant</h1>
    <hr />

    <h2>Would you like to know about the weather?</h2>
    <h3>Just start the conversation with our chatbot! </h3>
    <h3> Enter the name of a city to get the current weather conditions.</h3>
</body>

</html>
```

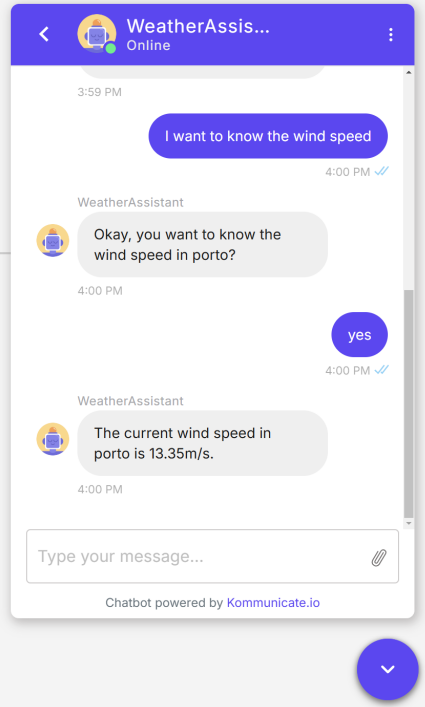
Integrate Kommunicate

Weather Assistant

Would you like to know about the weather?

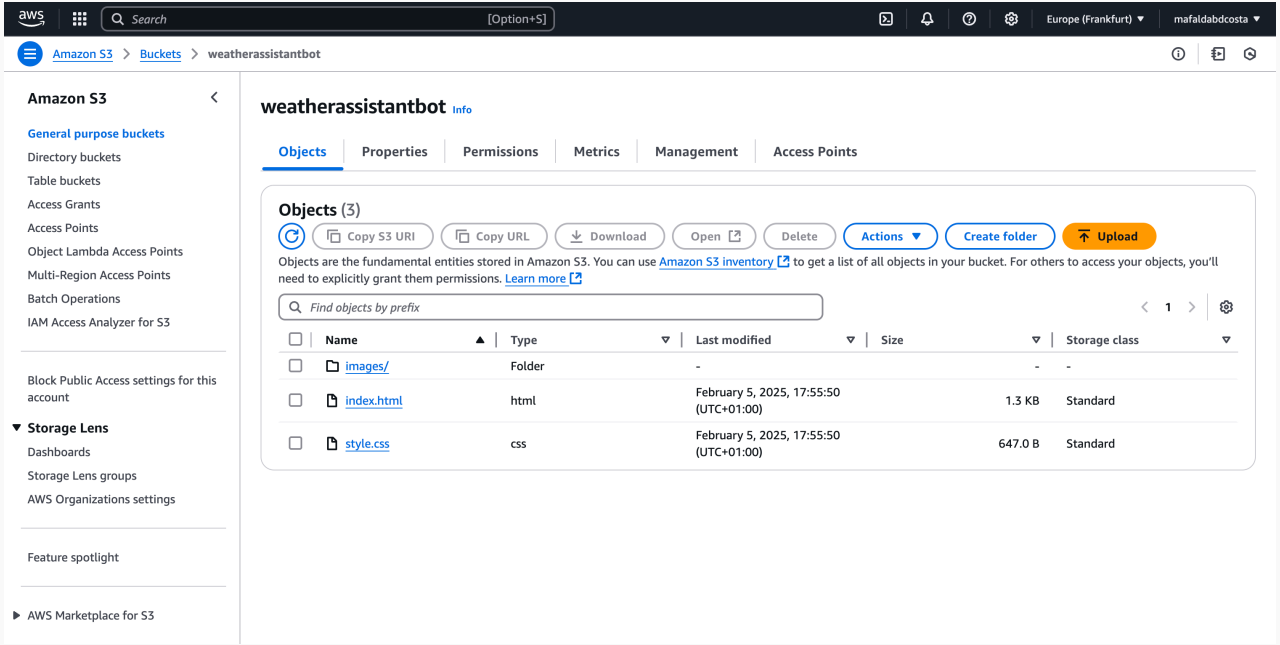
Just start the conversation with our chatbot!

Enter the name of a city to get the current weather conditions.



AWS S3

S3 bucket size: 100.4 KB



DEMO

Weather Assistant in

https://weatherassistantbot.s3.eu-central-1.amazonaws.com/index.html