**API Specifications Document**

Kristina Lashchuk

University of South Carolina Upstate

Department of Informatics, Spartanburg, SC USA

lashchuk@email.uscupstate.edu

**IP-API**

URL = http://ip-api.com/json/{query}

This API allows users to find a location with an IP address or domain. An API key is not required, and the response formats include JSON, XML, CSV, Newline, and PHP. It has three parameters: *fields, lang,* and *callback*. The Chart below lists all the fields and values this API can return. Users can choose specific fields to return by using the GET parameter *fields* such as (fields=status, message).

|  |  |
| --- | --- |
| **Name** | **Description** |
| status | Success or fail |
| message | Included only when status is false, can be; private range, reserved range, invalid query |
| continent | Continent name |
| continentCode | Two-letter continent code |
| country | Country name |
| countrycode | Two-letter country code |
| region | Region/state short code |
| regionName | Region/State |
| city | City |
| district | District (subdivision of city) |
| zip | Zip code |
| lat | Latitude |
| lon | Longitude |
| timezone | Timezone |
| offset | Timezone UTC DST offset in seconds |
| currency | National currency |
| isp | ISP name |
| org | Organization Name |
| as | AS number and organization, separated by space (RIR). Empty for IP blocks not being announced in BGP tables. |
| asname | AS name (RIR). Empty for IP blocks not being announced in BGP tables. |
| reverse | Reverse DNS of the IP (can delay response) |
| mobile | Mobile connection |
| proxy | Proxy, VPN, or Tor exit address |
| hosting | Hosting, collocated, or data center |
| query | IP used for the query |

The data can be returned in different languages using the parameter *lang*. The languages that can be used are English (en), German (de), Spanish (es), Portuguese (pt-BR), French (fr), Japanese (ja), Chinese (zh-CN), and Russian (ru). Although there is no callback function, you can use the GET parameter *callback*. This API is limited to 45 requests per minute from an IP address. A user that goes over the limit will have all their requests throttled until the limit window is reset and can be banned for an hour if the user constantly goes over the limit. The header X-R1 states the number of requests left, and the header X-Ttl states the seconds left until the limit is reset.

CODE:

import requests

response = requests.get("http://ip-api.com/json/47.42.13.87?fields=isp,city,regionName,lat,lon")

print(response.json)

**Open-Meteo**

URL = https://api.open-meteo.com/v1/forecast?latitude={lat}&longitude={lon}&current=temperature\_2m,relative\_humidity\_2m,precipitation,snowfall&temperature\_unit=fahrenheit

Open-Meteo is an API that gives users access to current and historical weather, ocean, air quality, ensemble forecasts, floods, and climate forecast data for any location on Earth. The data is collected from different sources, such as satellites, does not require an API key, and is available in JSON format. This API has the parameters latitude, longitude, elevation, hourly, daily, current, temperature\_units, wind\_speed\_unit, precipitation\_unit, timeformat, timezone, past\_days, forecast\_days, models, cell\_selection, and start\_date – end\_date. Additional parameters are forecast\_hours, forecast\_minutely\_15, past\_hours, past\_minutely\_15, start\_hour, end\_hour, start\_minutely\_15, and end\_minutely\_15. Users can call for hourly, daily, or current weather data which have similar and different response fields. The charts below list the response fields for hourly, daily, and current weather data. 42

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| --- | --- | --- | --- | --- | --- |
| **Hourly Weather** | | | | | |
| Temperature (2 m) | Relative Humidity (2 m) | Dewpoint (2 m) | Apparent Temperature | Precipitation Probability | Precipitation (rain + showers + snow) |
| Rain | Showers | Snowfall | Snow Depth | Weather code | Sealevel Pressure |
| Surface Pressure | Cloud cover Total | Cloud cover Low | Cloud cover Mid | Cloud cover High | Visibility |
| Evapotranspiration | Reference Evapotranspiration | Vapour Pressure Deficit | Wind Speed (10 m) | Wind Speed (80 m) | Wind Speed (120 m) |
| Wind Speed (180 m) | Wind Direction (10 m) | Wind Direction (80 m) | Wind Direction (120 m) | Wind Direction (180 m) | Wind Gusts (10 m) |
| Temperature (80 m) | Temperature (120 m) | Temperature 180 m) | Soil Temperature (0 cm) | Soil Temperature (6 cm) | Soil Temperature (18 cm) |
| Soil Temperature (54 cm) | Soil Moisture (0-1 cm) | Soil Moisture (1-3 cm) | Soil Moisture (3-9 cm) | Soil Moisture (9-27 cm) | Soil Moisture (27-81cm) |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Daily Weather** | | | | | |
| Weather Code | Maximum Temperature (2 m) | Minimum Temperature (2 m) | Maximum Apparent Temperature (2 m) | Maximum Apparent Temperature (2 m) | Sunrise |
| Sunset | Daylight Duration | Sunshine Duration | UV Index | UV Index Clear Sky | Precipitation Sum |
| Rain Sum | Showers Sum | Snowfall Sum | Precipitation Hours | Precipitation Probability Max | Maximum Wind Speed (10 m) |
| Maximum Wind Gusts (10 m) | Dominant Wind Direction (10 m) | Shortwave Radiation Sum | Reference Evapotranspiration |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Current Weather** | | | | | |
| Temperature (2 m) | Relative Humidity (2 m) | Apparent Temperature | Is Day or Night | Precipitation | Rain |
| Showers | Snowfall | Weather Code | Cloud Cover Total | Sealevel Pressure | Surface Pressure |
| Wind Speed (10 m) | Wind Direction (10 m) | Wind Gusts (10 m) |  |  |  |

Users can make a call by latitude and longitude coordinates, and the units or format for temperature, wind speed, precipitation, and timeformat can be changed. Temperature can be in Fahrenheit or Celsius, Wind speed can be in kilometers per hour, meter per second, miles per hour, or knots, precipitation can be in millimeters or inches, and timeformat can be in ISO 8601 or Unix timestamp. Additionally, the chart below lists the weather codes used in this API.

|  |  |
| --- | --- |
| **WMO Weather Interpretation Codes (WW)** | |
| **Code** | **Description** |
| 0 | Clear sky |
| 1, 2, 3 | Mainly clear, partly cloudy, and overcast |
| 45, 48 | Fog and depositing rime fog |
| 51, 53, 55 | Drizzle: light, moderate, and dense intensity |
| 56, 57 | Freezing Drizzle: light and dense intensity |
| 61, 63, 65 | Rain: slight, moderate, and heavy intensity |
| 66, 67 | Freezing Rain: light and heavy intensity |
| 71, 73, 75 | Snow fall: slight, moderate, and heavy intensity |
| 77 | Snow grains |
| 80, 81, 82 | Rain showers: slight, moderate, and violent |
| 85, 86 | Snow showers slight and heavy |
| 95 \* | Thunderstorm: slight or moderate |
| 96, 99 \* | Thunderstorm with slight and heavy hail |
| (\*) Thunderstorm forecast with hail is only available in Central Europe | |

CODE:

import requests

response = requests.get("https://api.open-meteo.com/v1/forecast?latitude=35.07&longitude=-81.96&current=temperature\_2m,relative\_humidity\_2m,precipitation,snowfall&temperature\_unit=fahrenheit")

print(response.json)

**Pollen API**

URL =https://pollen.googleapis.com/v1/forecast:lookup?key={My\_Key}

This API allows users to request pollen information for a specific location. The plants that are supported by this API are alder, ash, birch, cottonwood, elm, maple, olive, juniper, oak, pine, cypress\_pine, hazel, graminales, ragweed, and mugwort. This API does require an API key that will allow users to receive a 5-day maximum pollen forecast. For all plant types in Canada and the US, a 5-day pollen forecast is provided. However, for other countries, a 5-day pollen forecast is available only for the plants Ash, Cottonwood, Oak, Pine, and Hazel. The parameters for this API are location (including longitude and latitude), key (API key), days (a number from 1 to 5 that indicates how many days to request), features (sets the data fields returned by the response), pageSize, pageToken, languageCode (sets the response language), and plantsDescription. Response fields include regionCode, dailyInfo, and nextPageToken. The response field dailyInfo contains the daily forecast information for each day requested, and includes the fields date, pollenTypeInfo, and plantInfo. PollenTypeInfo lists up to three pollen types affecting the location requested and will include the fields code, displayName, indexInfo, healthRecommendations, and inSeason. PlantInfo lists up to 15 pollen species affecting the location requested and includes the fields code, displayName, indexInfo, plantDescription, and inSeason. Users can limit the number of forecasted days on a page using pageSize and request access to the other days using nextPageToken.

CODE:

import requests

response = requests.get("https://pollen.googleapis.com/v1/forecast:lookup?key=AIzaSyBq-V3B0PuvZMPCRgbMGxNSDOwmNXZU5DU&location.longitude=-81.69&location.latitude=35.07&days=1")

print(response.json)