

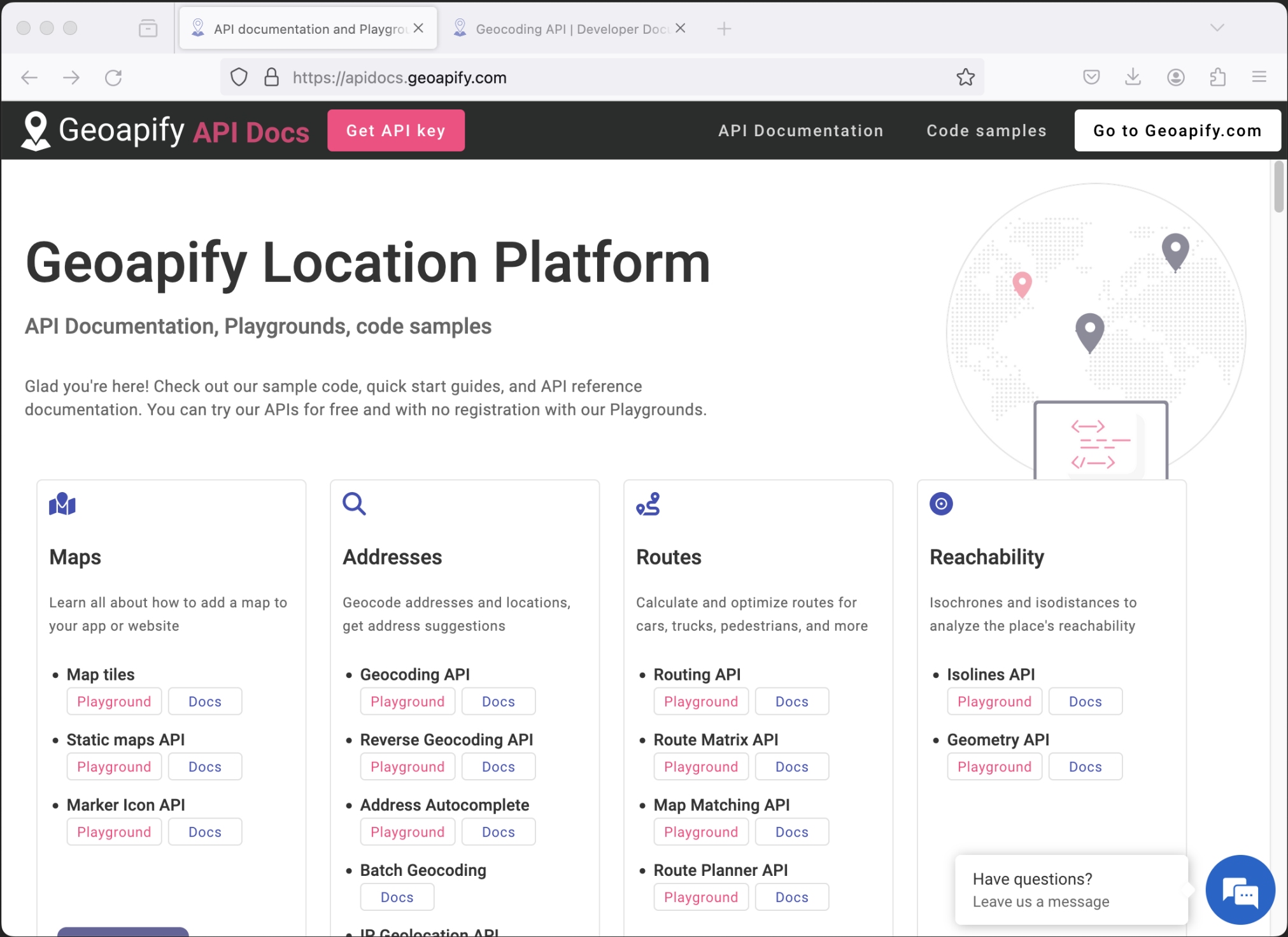
APIs

http://en.wikipedia.org/wiki/Web_services

There Are Many APIs

- There are organizations that put up public APIs and sell access to those APIs
- We will explore a geocoding API based on the OpenStreetMap data
- You need an account to access this API
- There is a free level of requests
- You pay above that rate of usage

<https://www.geoapify.com/>



<https://www.geoapify.com/>

API documentation and Playgro X

Geocoding API | Developer Docu X

https://apidocs.geoapify.com/docs/geocoding/forward-geocoding/#about

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Forward Geocoding API

Geoapify provides [Geocoding REST API](#) that searches addresses worldwide. The REST API works via HTTP GET and returns JSON or XML responses. The API is cross-platform and can be used with most programming languages.

On this documentation page, you find **geocoding examples**, including calling the geocoding with **Javascript, Python, Java** languages. We show you how to geocode countries, states, cities, postcodes (or zip codes). Our code samples demonstrate how to geocode addresses with filters by geometries, bias, and different languages.

Try the API and play with Geocoding parameters in the API Playground:

LIVE DEMO

- [Authentication and Geocoding API key](#)
- [API reference](#)
- [Geocode addresses](#)
- [Geocode cities](#)
- [Geocode ZIP codes \(postcodes\)](#)
- [Code samples \(JS, NodeJS, Python, Java\)](#)
- [Pricing](#)

Authentication and API key

To use the API, you'll need an API key. But don't worry! You can register and **get a Geocod**

Have questions?
Leave us a message

edit

[illegible]

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32 | .catch(error => console.log('error', error));

Pricing

Geoapify Location Platform provides APIs which have different difficulty, execution times and require different resource capacities on our servers.

To make our pricing plans easy-to-understand and unify them we introduced "credits" currency that is used to describe conditions and options of each pricing plan. All the credits used for Geoapify API calls per 24 hours accumulated to Daily API usage.

Check [Geoapify Pricing Plans](#) and choose the one that fits your needs the best.

One Geocoding API / Reverse Geocoding API / Autocomplete API request is equal to one credit:

API name	Cost in credits	Example
Geocoding API	1 request = 1 credit	100 requests costs 100 credits
Reverse Geocoding API	1 request = 1 credit	100 requests costs 100 credits
Address Autocomplete	1 request = 1 credit	100 requests costs 100 credits

You can save up to 50% of API call costs when you send [Batch Geocoding requests](#).

Learn more

[Geoapify Pricing Plans](#)

[Pricing Details](#)

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Authentication and API key

To use the API, you'll need an API key. But don't worry! You can register and **get a Geocoding API key for free** without a credit card. Our free plan includes up to 3000 geocoding requests/day. For more information on our plans, visit the [Pricing page](#).

How to get Geocoding API key

1. Register on [Geoapify MyProjects](#) page

2. Create a new project.

3. Go to the API Keys section. One API key is generated automatically. You can generate multiple API keys per project if required.

4. Optionally, you can protect the API key by listing allowed IP addresses, HTTP referrers, origins, and CORS.

5. Choose "Geocoding API" and an API key to get an URL and programming code.

6. Press the "Try" button to execute the API call and get the result object.

API reference

The Geocoder API accepts both structured and free-form addresses as an input and returns JSON, GeoJSON, and XML objects as a response. In addition, you can specify location filters and preferred geographical areas to make the address search more accurate and focused. ##### Request URL

https://api.geoapify.com/v1/geocode/search?REQUEST_PARAMS

Here are Geocoding URL examples (click on a URL to test the API):

Have questions?

Leave us a message

An API Proxy

- To avoid making you get an account, I have a well-hidden web server that acts as a proxy for the Geoapify data
- This proxy does not require a password – but it does have rate limits and is heavily cached using an edge-caching service for performance



<http://py4e-data.dr-chuck.net/opengeo?q=Ann+Arbor%2C+MI>

```
{
  "type": "FeatureCollection",
  "features": [
    {
      "type": "Feature",
      "properties": {
        "datasource": {
          "sourcename": "openstreetmap",
          "attribution": "© OpenStreetMap contributors",
          "license": "Open Database License",
          "url": "https://www.openstreetmap.org/copyright"
        },
        "country": "United States",
        "country_code": "us",
        "state": "Michigan",
        "county": "Washtenaw County",
        "city": "Ann Arbor",
        "lon": -83.7312291,
        "lat": 42.2681569,
        "state_code": "MI",
        "result_type": "city",
        "formatted": "Ann Arbor, MI, United States of America",
```

Note, for this course, we operate through a proxy of the geoapi data to avoid rate limitation and authentication.

opengeo.py

```
import urllib.request, urllib.parse
import http, json, ssl

serviceurl = 'https://py4e-data.dr-chuck.net/opengeo?'

while True:
    address = input('Enter location: ')
    if len(address) < 1: break

    address = address.strip()
    parms = dict()
    parms['q'] = address

    url = serviceurl + urllib.parse.urlencode(parms)

    print('Retrieving', url)
    uh = urllib.request.urlopen(url, context=ctx)
    data = uh.read().decode()
    print('Retrieved', len(data), 'characters', data[:20].replace('\n', ' '))

    js = json.loads(data)

    lat = js['features'][0]['properties']['lat']
    lon = js['features'][0]['properties']['lon']
    print('lat', lat, 'lon', lon)
    location = js['features'][0]['properties']['formatted']
    print(location)
```

Enter location: Ann Arbor, MI
Retrieving https://py4e-data.
dr-chuck.net/opengeo?q=Ann+Arbor%2C+MI
Retrieved 1319 characters {"type":"FeatureColl
lat 42.2681569 lon -83.7312291
Ann Arbor, MI, United States of America

opengeo.py

Summary

- **Service Oriented Architecture** - allows an application to be broken into parts and distributed across a network
- **An Application Program Interface (API)** is a contract for interaction
- **Web Services** provide infrastructure for applications cooperating (an API) over a network - SOAP and REST are two styles of web services
- **XML and JSON** are serialization formats



Acknowledgements / Contributions



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