Example ONE - Geocode and enrich using APIs

Introduction

In this example we will geocode a bunch of adresses and calculate some distances from a fixed POI.

Import the data

- Import the file named addresses.csv

Geocoding with nominatim

We will use the API proposed by Nominatim, a free geolocation service based on OpenStreetMap.

Be nice with APIs, the limit is one request per second.

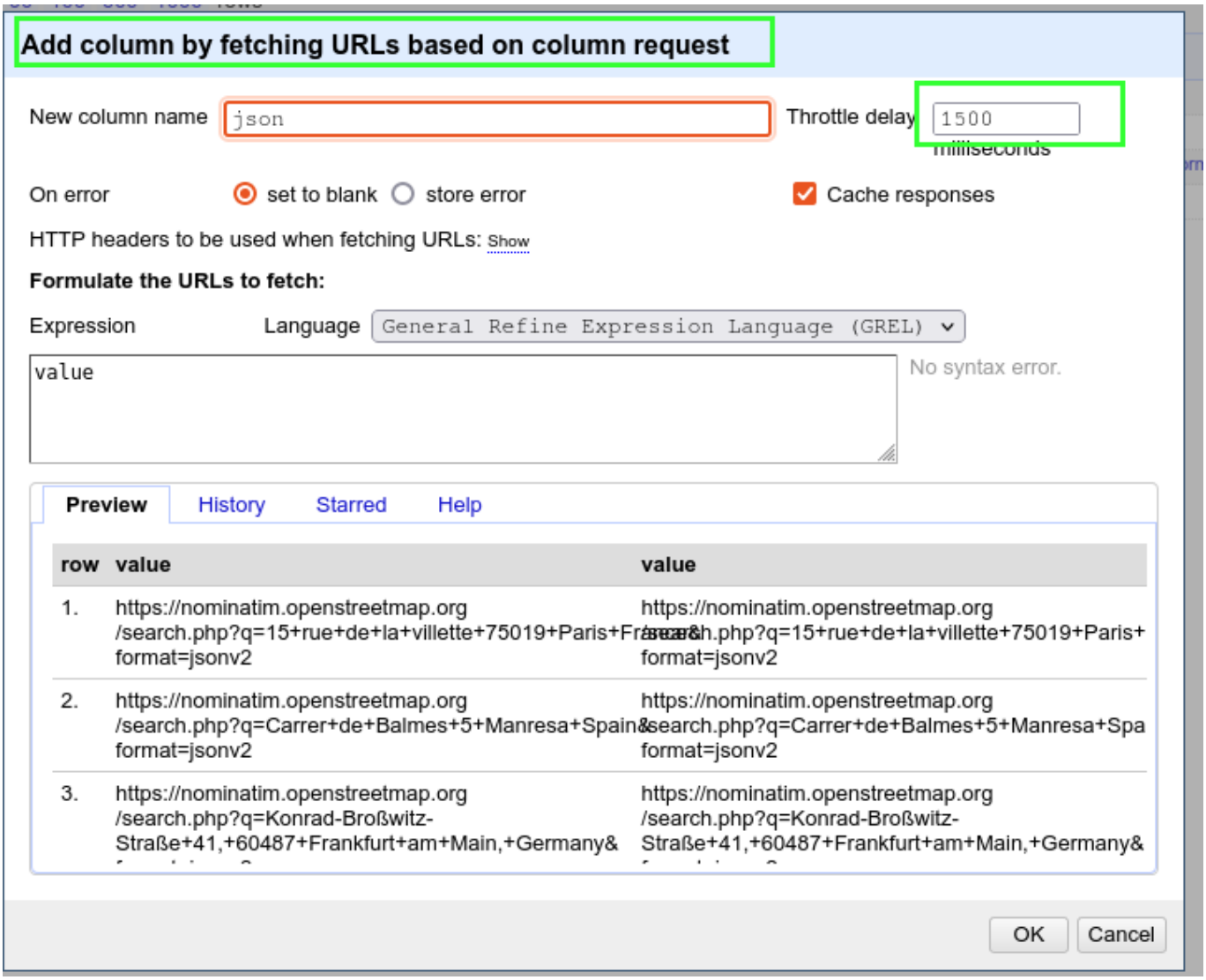
Create a new column called *request* using the formula :

```
"https://nominatim.openstreetmap.org/search.php?q="+value.replace('
','+')+"&format=jsonv2"
```

Please note that we replace the space character by a plus sign at the same time.

Create a column based on this column, using the function FETCH URL

Important Throttle delay > 1500ms to respect the API.



You will receive the geolocation data as JSON format.

Create a new column *lat* base ont his result using the following GREL command :

```
value.parseJson()[0].lat
```

Do the same for a column *lon* using this formula :

```
value.parseJson()[0].lat
```

Remove the useless columns. ou have now three columns : address, lat, lon

Part 2 - Calculate distances

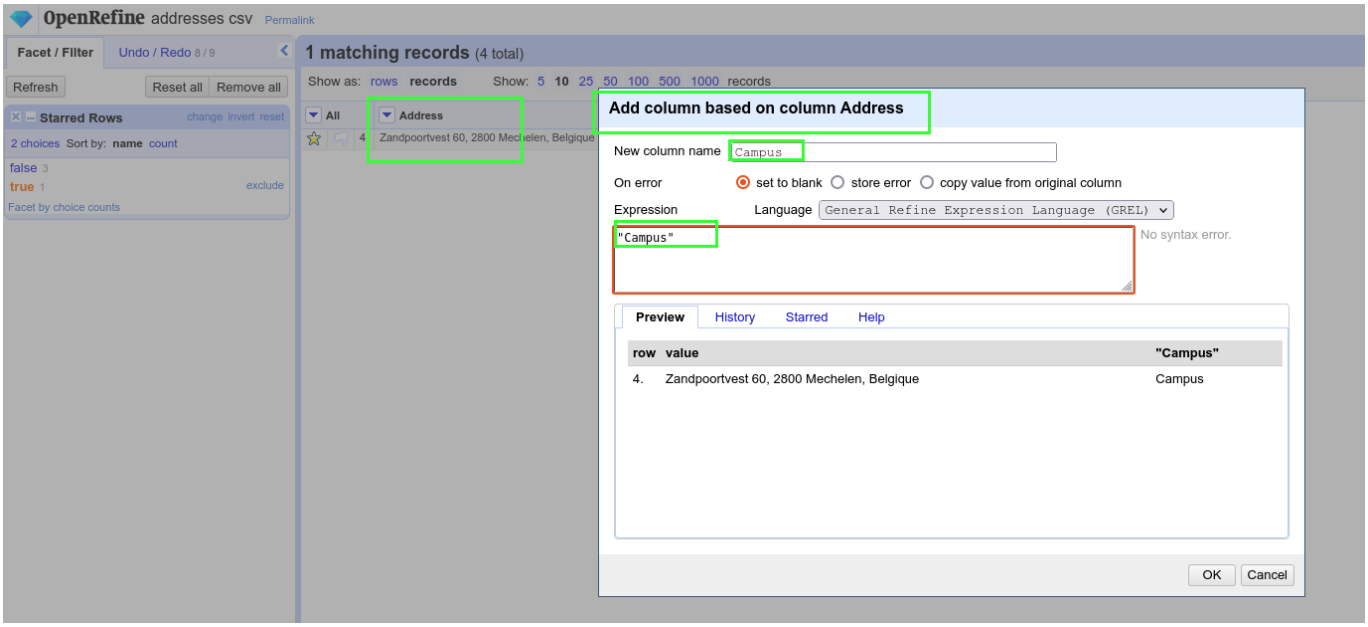
Our goal is to calculate the distances from the addresses in Spain France and Germany, to the Campus in Mechelen. We will use this OSMR project API but first, we need to restructure the project.

Preparing the dataset

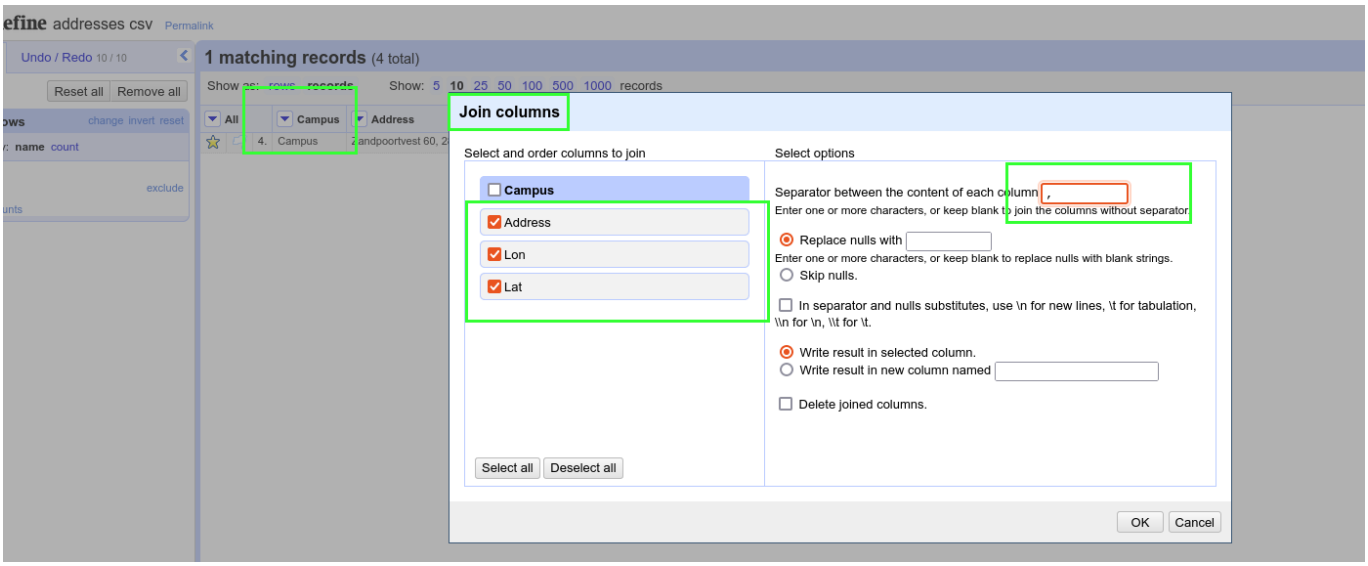
The Mechelen Address should be in the first column as it's our point of reference.

- Star row 4 (Mechelen) and facet your project by star. Row 4 should temporarly remain alone in your project.

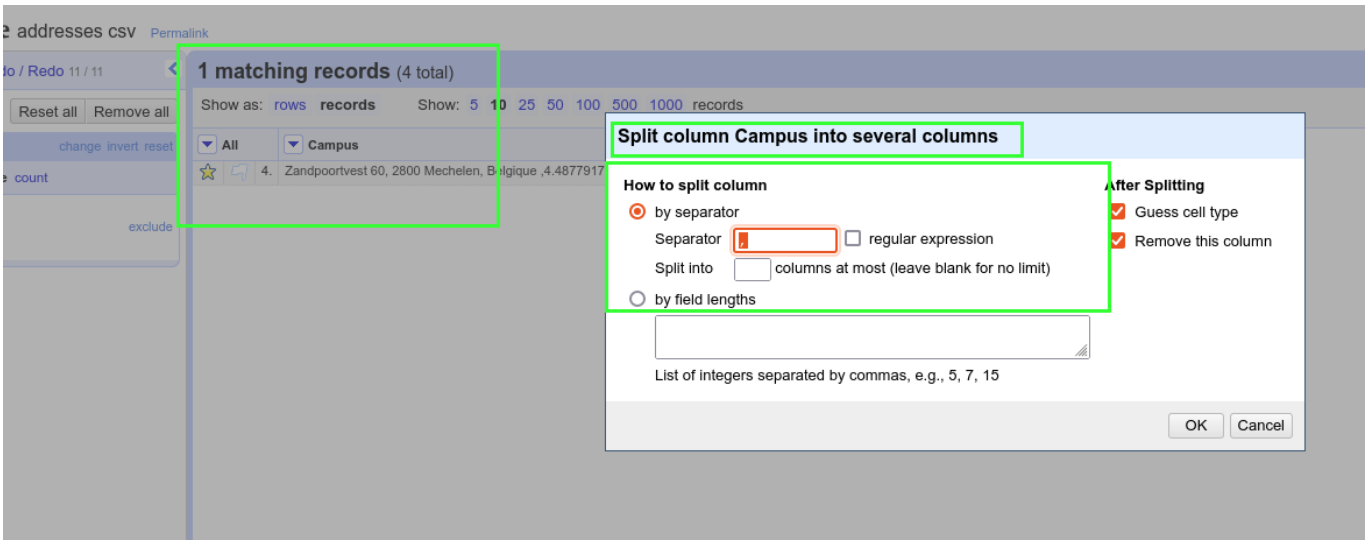
- Add a column called campus where the valus is "campus".



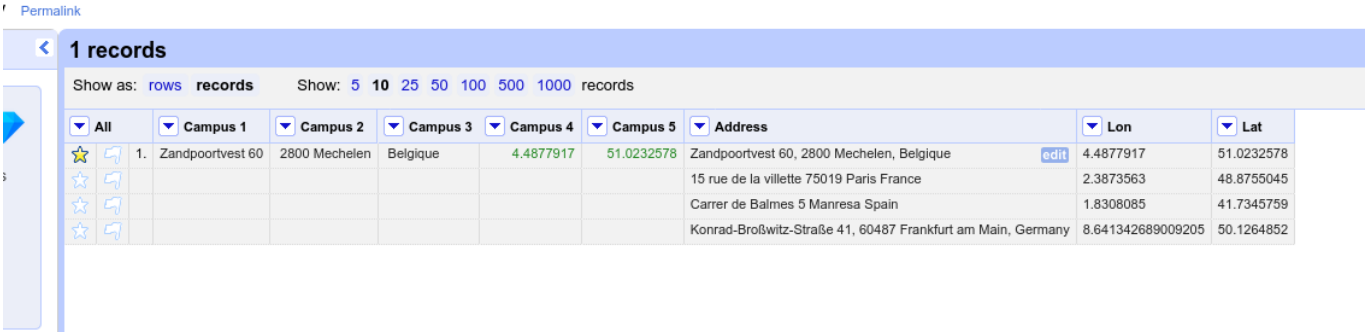
- Based on this column, join the other columns.



- Split this column using the comma separator



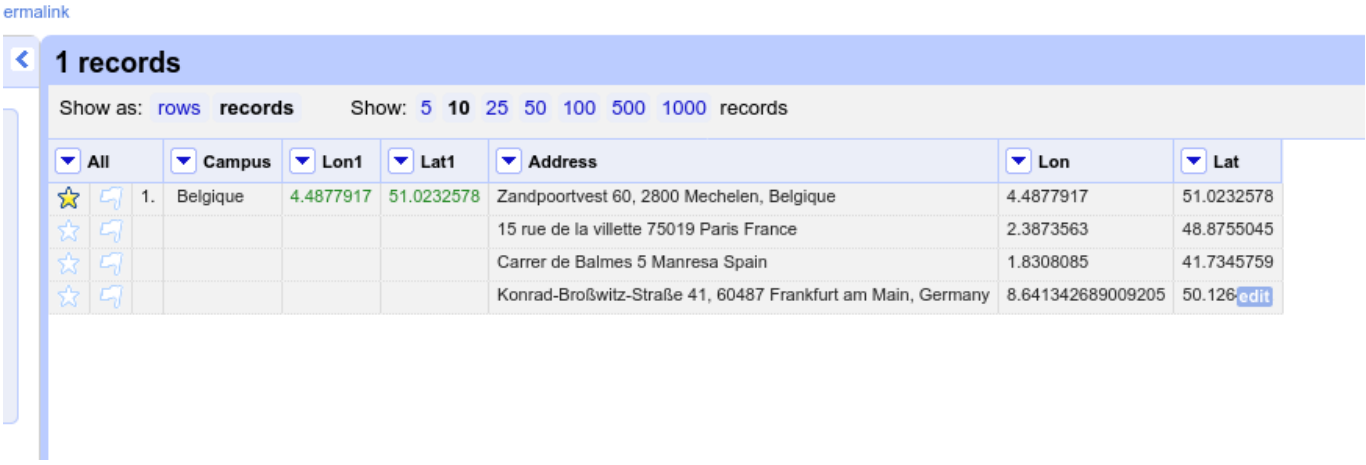
- sorting the column Campus1 by text should give you this result :



All		Campus 1	Campus 2	Campus 3	Campus 4	Campus 5	Address	Lon	Lat
☆	1.	Zandpoortvest 60	2800 Mechelen	Belgique	4.4877917	51.0232578	Zandpoortvest 60, 2800 Mechelen, Belgique edit	4.4877917	51.0232578
☆							15 rue de la villette 75019 Paris France	2.3873563	48.8755045
☆							Carrer de Balmes 5 Manresa Spain	1.8308085	41.7345759
☆							Konrad-Broßwitz-Straße 41, 60487 Frankfurt am Main, Germany	8.641342689009205	50.1264852

We can now remove column Campus 1 and Campus 2.

We rename Campus 3 as "Campus", Campus 4 as "Lon1" and Campus 5 as "Lat1".



All		Campus	Lon1	Lat1	Address	Lon	Lat
☆	1.	Belgique	4.4877917	51.0232578	Zandpoortvest 60, 2800 Mechelen, Belgique	4.4877917	51.0232578
☆					15 rue de la villette 75019 Paris France	2.3873563	48.8755045
☆					Carrer de Balmes 5 Manresa Spain	1.8308085	41.7345759
☆					Konrad-Broßwitz-Straße 41, 60487 Frankfurt am Main, Germany	8.641342689009205	50.126edit

We now use the fill fonction on Campus, Lat1 and Lat2.

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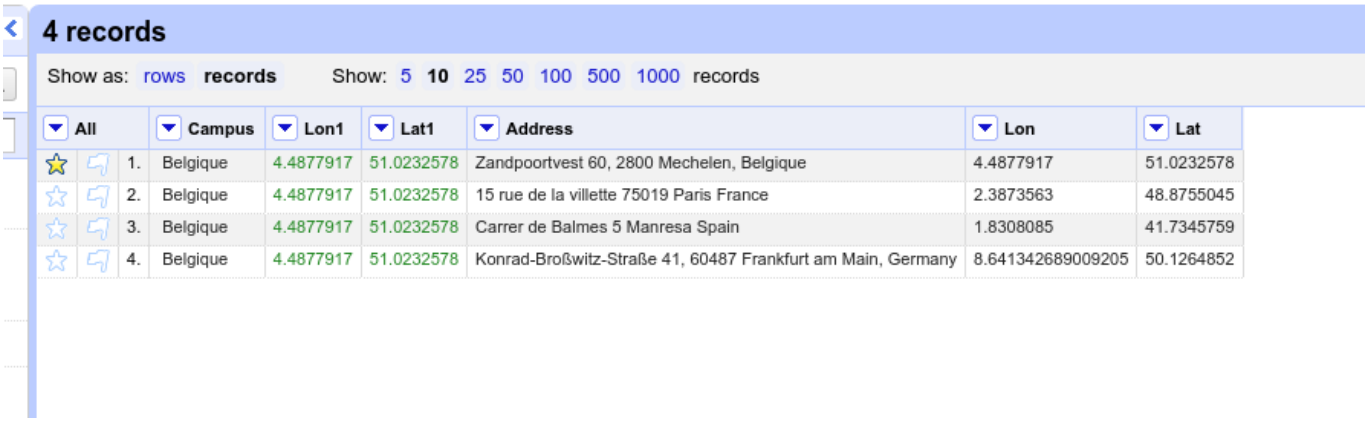

4 records

Show as: rows **records** Show: 5 **10** 25 50 100 500 1000 records

All		Campus	Lon1	Lat1	Address	Lon	Lat
☆	1.	Belgique	4.4877917	51.0232578	Zandpoortvest 60, 2800 Mechelen, Belgique	4.4877917	51.0232578
☆	2.	Belgique	4.4877917	51.0232578	15 rue de la villette 75019 Paris France	2.3873563	48.8755045
☆	3.	Belgique	4.4877917	51.0232578	Carrer de Balmes 5 Manresa Spain	1.8308085	41.7345759
☆	4.	Belgique	4.4877917	51.0232578	Konrad-Broßwitz-Straße 41, 60487 Frankfurt am Main, Germany	8.641342689009205	50.1264852

And we can remove the useless first row (starred).

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3 records

Show as: rows **records** Show: 5 **10** 25 50 100 500 1000 records

All		Campus	Lon1	Lat1	Address	Lon	Lat
☆	1.	Belgique	4.4877917	51.0232578	15 rue de la villette 75019 Paris France	2.3873563	48.8755045
☆	2.	Belgique	4.4877917	51.0232578	Carrer de Balmes 5 Manresa Spain	1.8308085	41.7345759
☆	3.	Belgique	4.4877917	51.0232578	Konrad-Broßwitz-Straße 41, 60487 Frankfurt am Main, Germany	8.641342689009205	50.1264852

Calculate distances

We use the OSMR project API.

We create an URL based on Lon1 column :

```
"http://router.project-
osrm.org/route/v1/driving/"+value+","+cells['Lat1'].value+";"+cells['Lon'].
value+","+cells['Lat'].value+"?overview=false"
```

- Based on this new column, create a Fetch URL column __but be aware of the throttle delay of 5000ms minimum between two requests.
- Parse this column using this formula to get the distance in kilometers.

```
(value.parseJson().routes[0].distance).toNumber()/1000
```