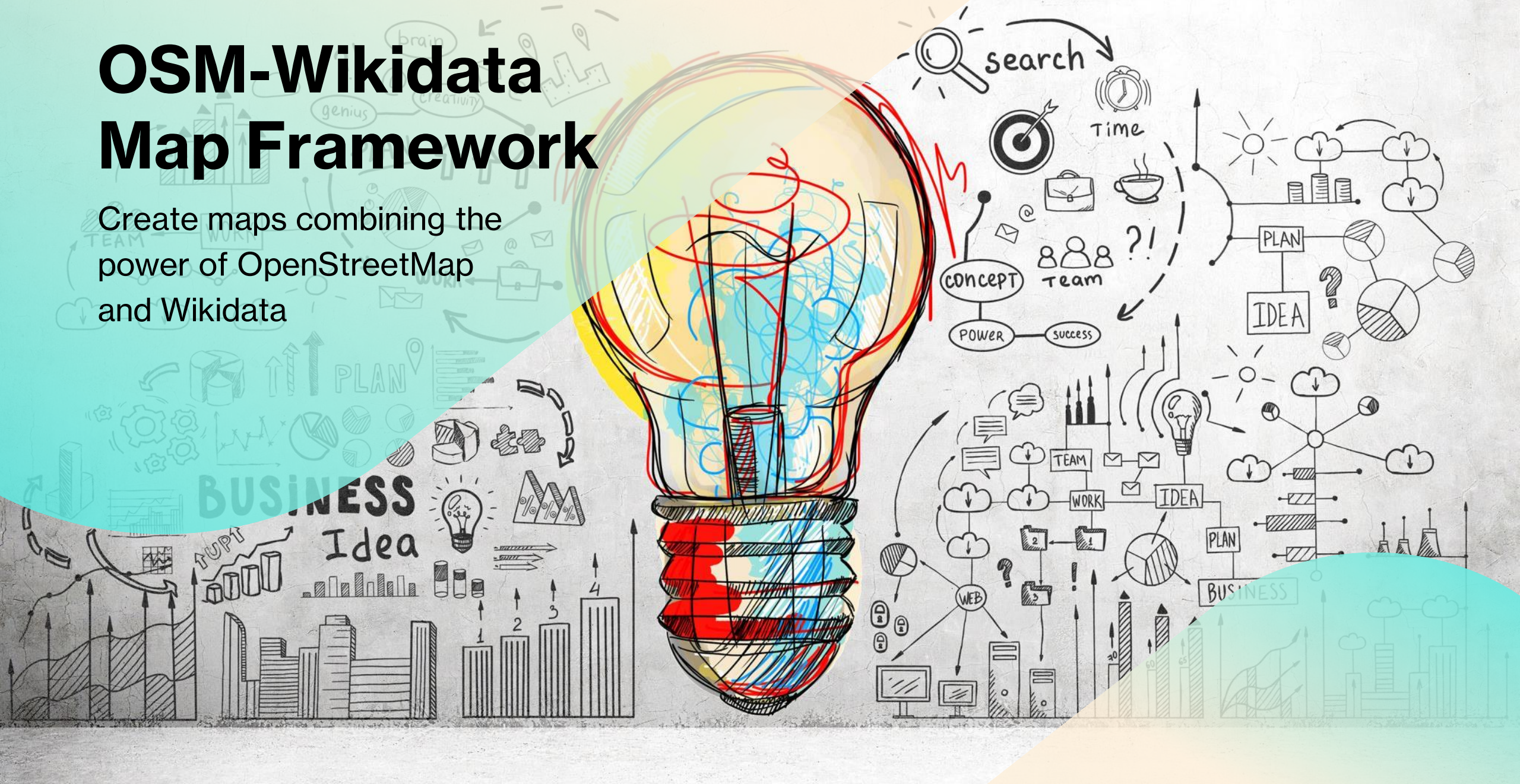
OSM-Wikidata Map Framework

Create maps combining the power of OpenStreetMap and Wikidata



$ whoami

Daniele Santini

Computer engineer

FOSS & Open Knowledge enthusiast

dsantini.it

GitLab: dsantini

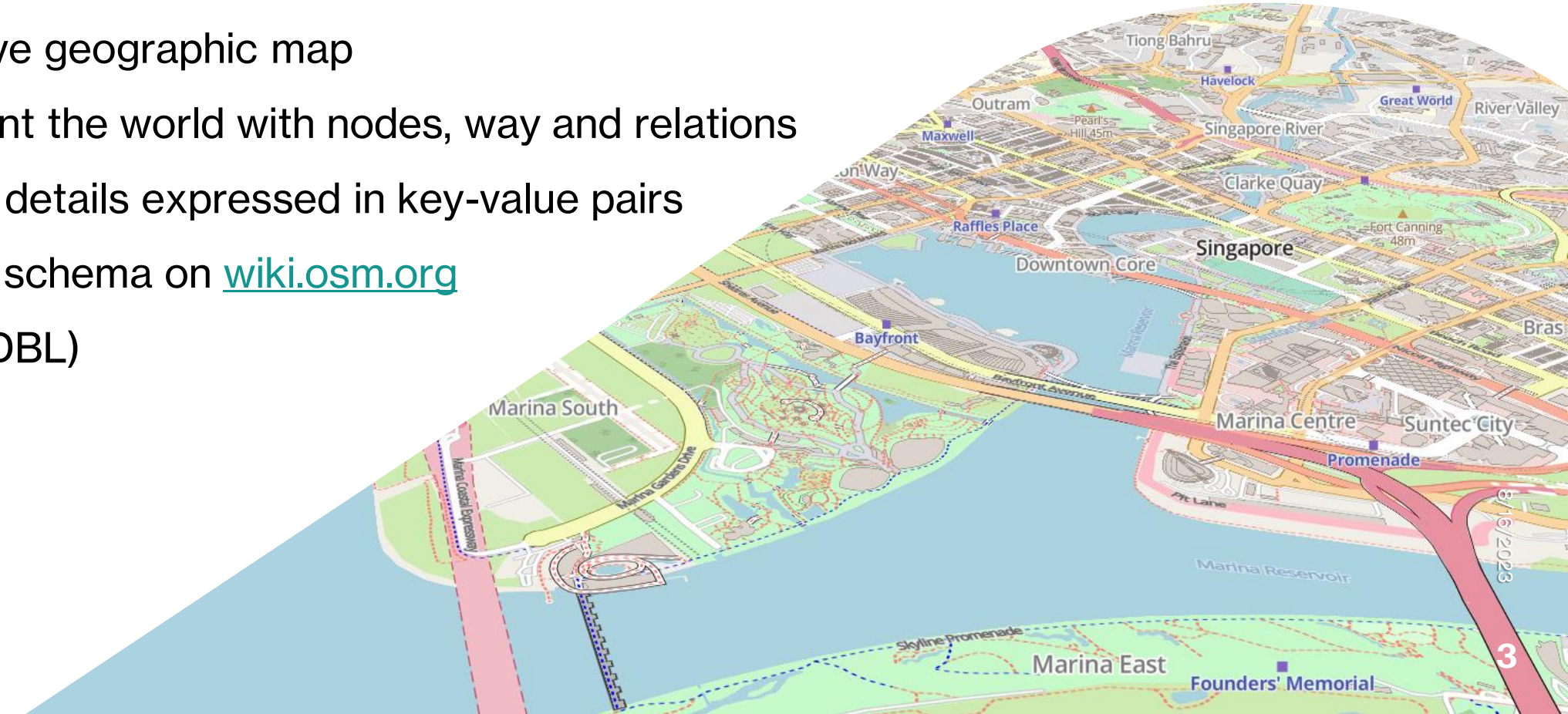
GitHub: Danysan1

OpenStreetMap

openstreetmap.org

Collaborative geographic map

- Represent the world with nodes, way and relations
- Element details expressed in key-value pairs
- Tagging schema on wiki.osm.org
- Free (ODBL)

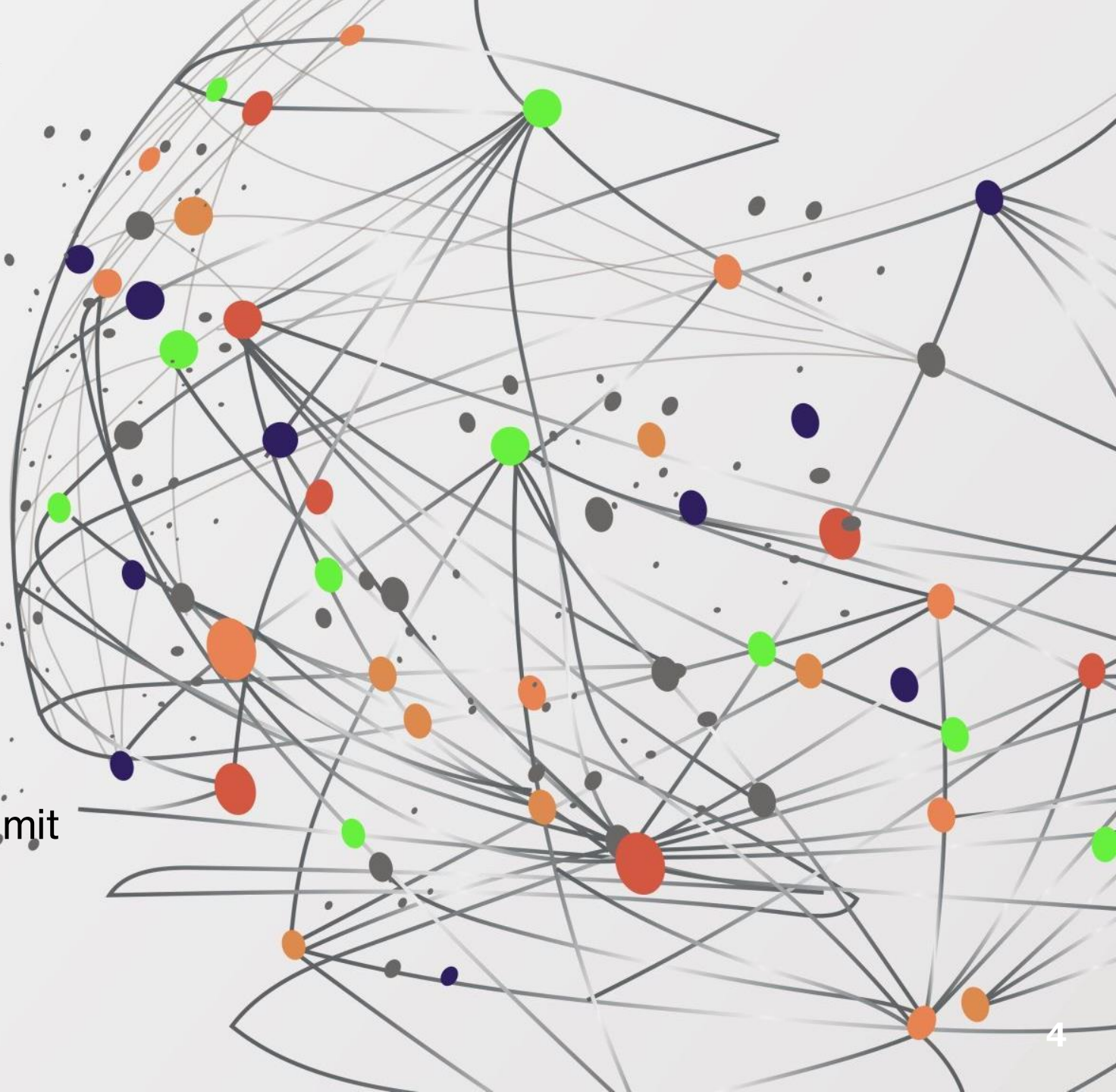


Wikidata

wikidata.org

Knowledge graph

- Free (CC0, Public Domain)
- Collaborative
- Multilingual
- Secondary (sources & links)
- General purpose, notability is the limit



Wikidata data model

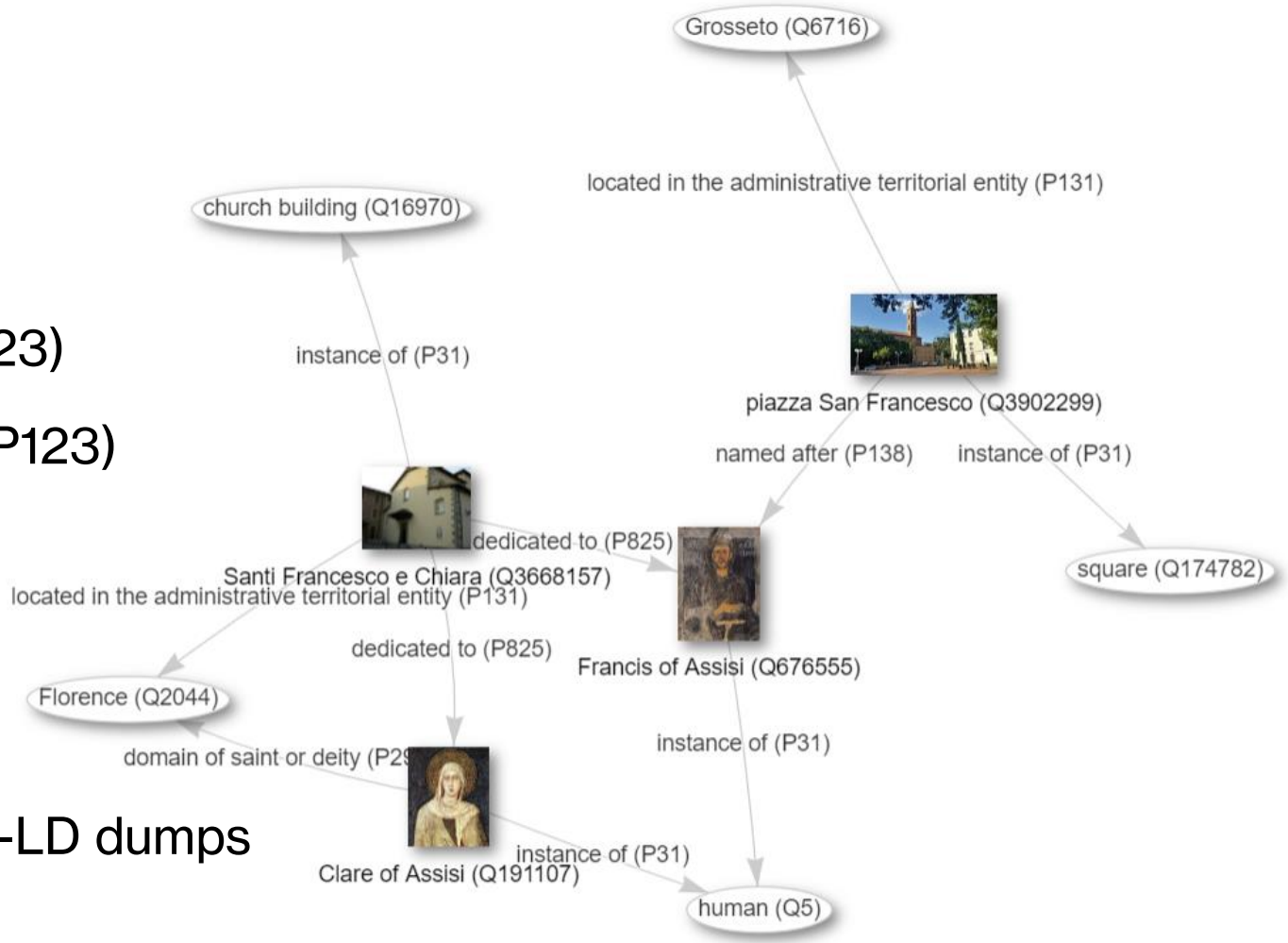
Entities identified by Q-IDs (ex: Q123)

Properties identified by P-IDs (ex: P123)

<subject, predicate, object> triples

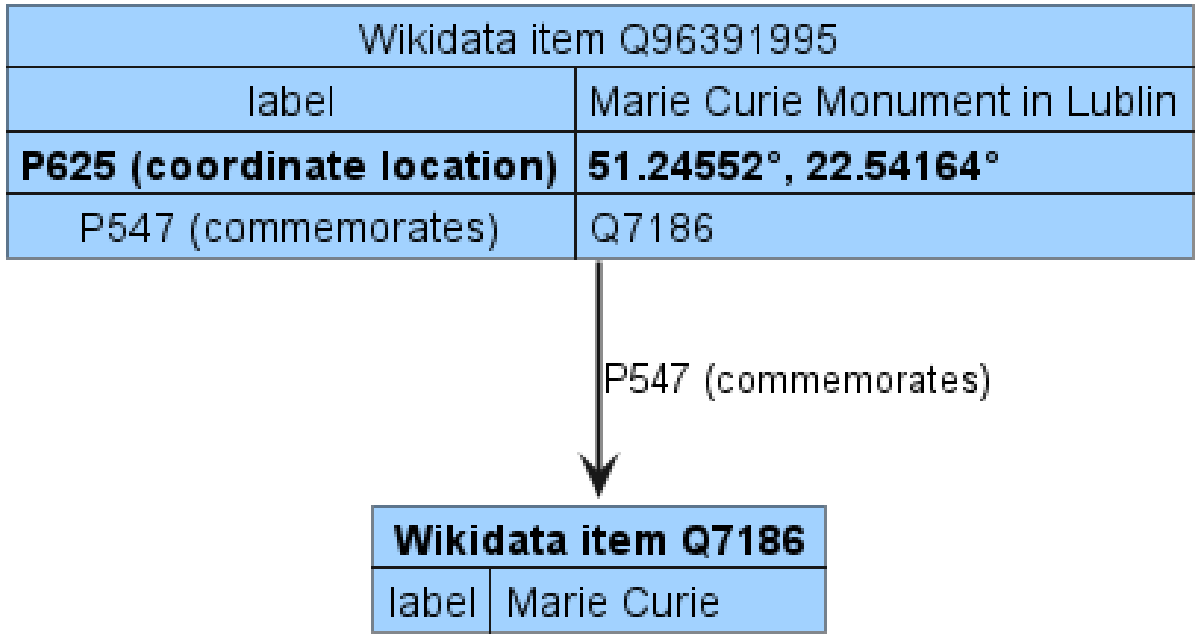
Main usage methods:

- SPARQL endpoint
- JSON / RDF / N-Triples / JSON-LD dumps



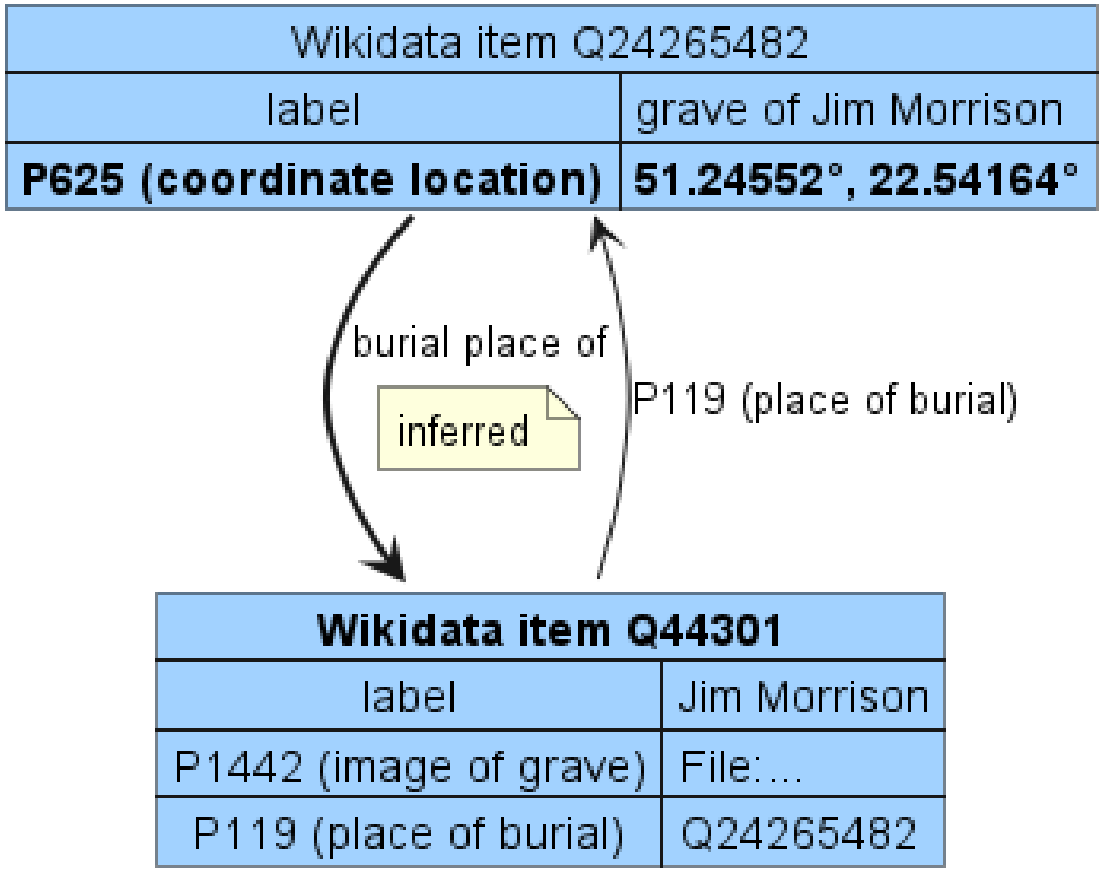
Geographic patterns: P625 + Direct properties

Wikidata item with a **coordinate location (P625) and a property** linking to another Wikidata item which **describes a certain aspect** of the first one



Geographic patterns: P625 + Inverse properties

Wikidata item with a **coordinate location (P625), referenced with an «inverse» property** by another Wikidata item which **describes a certain aspect** of the first one



Geographic patterns: P625 qualifier on inverse properties

Wikidata item with a **coordinate location (P625) qualifier on** a statement **of an inverse property** to another Wikidata item which **describes a certain aspect** of the first one

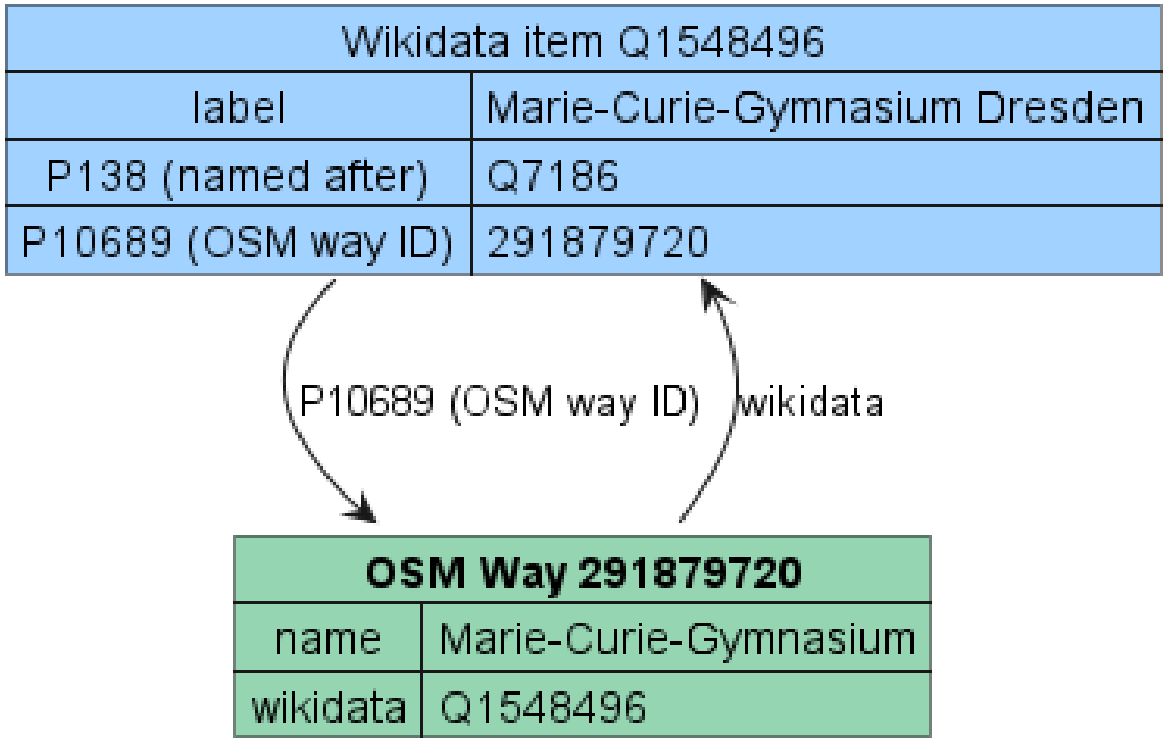
Wikidata item Q8772		
label	Jean Baptiste Joseph Fourier	
P1442 (image of grave)	File:...	
P119 (place of burial)	value	Q311 (Père Lachaise Cemetery)
	P625 (coordinate location)	**48.86005°, 2.394004°**

OSM 🤝 Wikidata

Geographic data patterns in OpenStreetMap & Wikidata

OSM wikidata=*

Q-ID of the Wikidata item **describing the exact same entity** represented by the OSM element

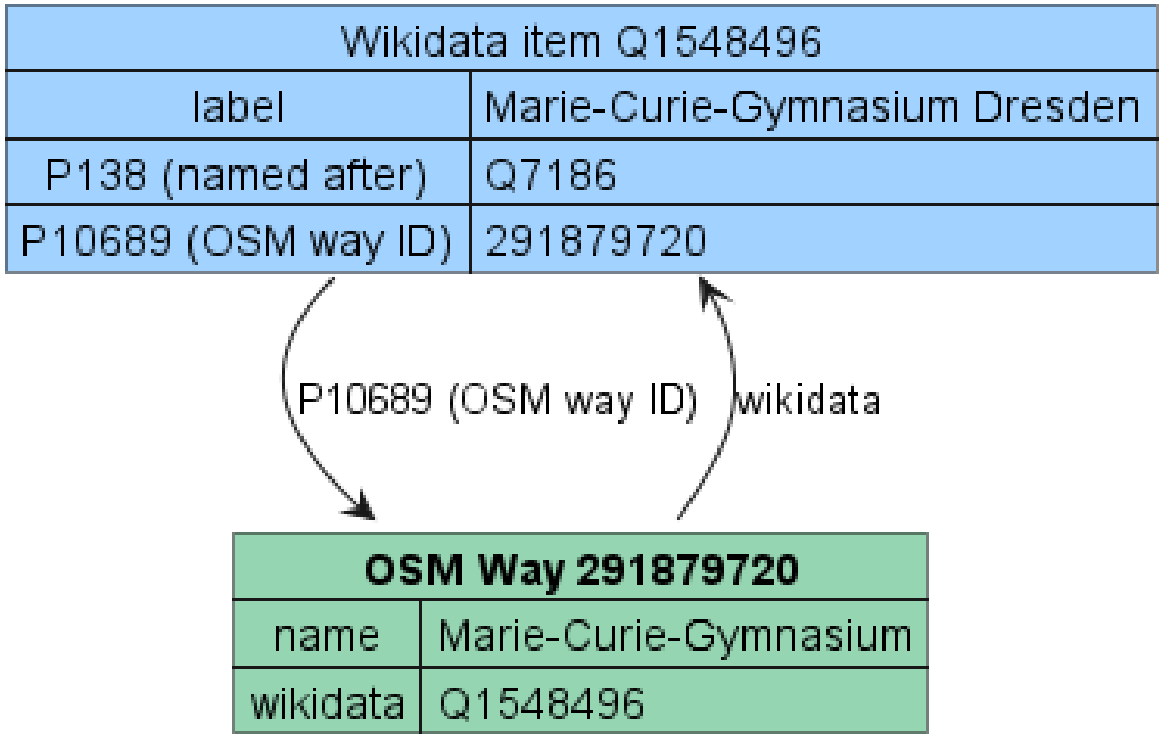


Wikidata -> OSM

ID of the OSM element **representing the exact same entity** described in the Wikidata item

- **P11693** (OSM **node** id)
- **P10689** (OSM **way** ID)
- **P402** (OSM **relation** ID)

Discussion under way on the sufficient stability of nodes and ways

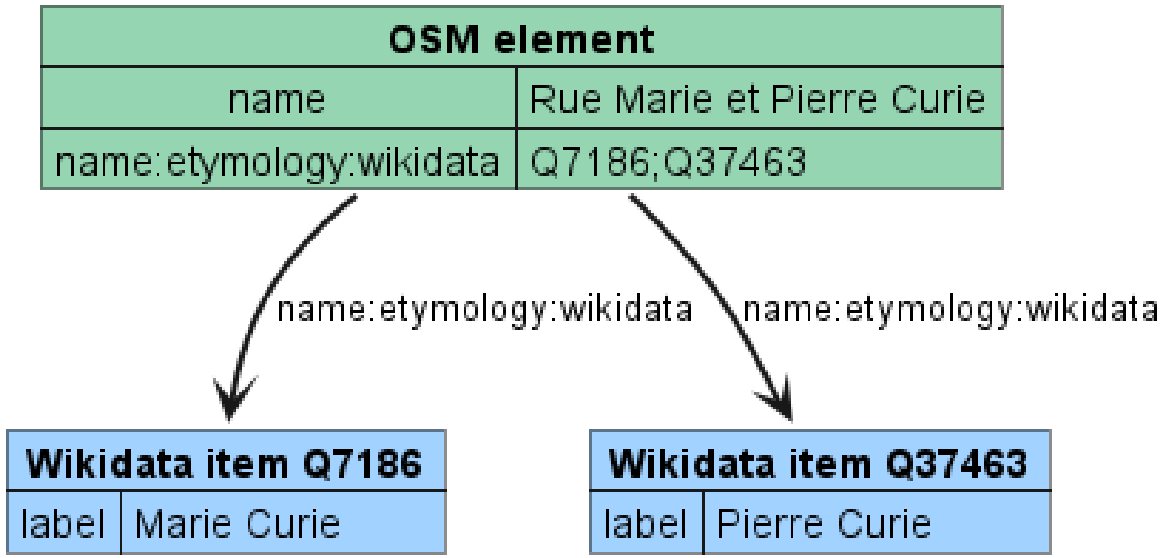


OSM *:wikidata=* a.k.a. secondary Wikidata tags

Q-ID of the Wikidata item **describing a certain aspect** of the OSM element

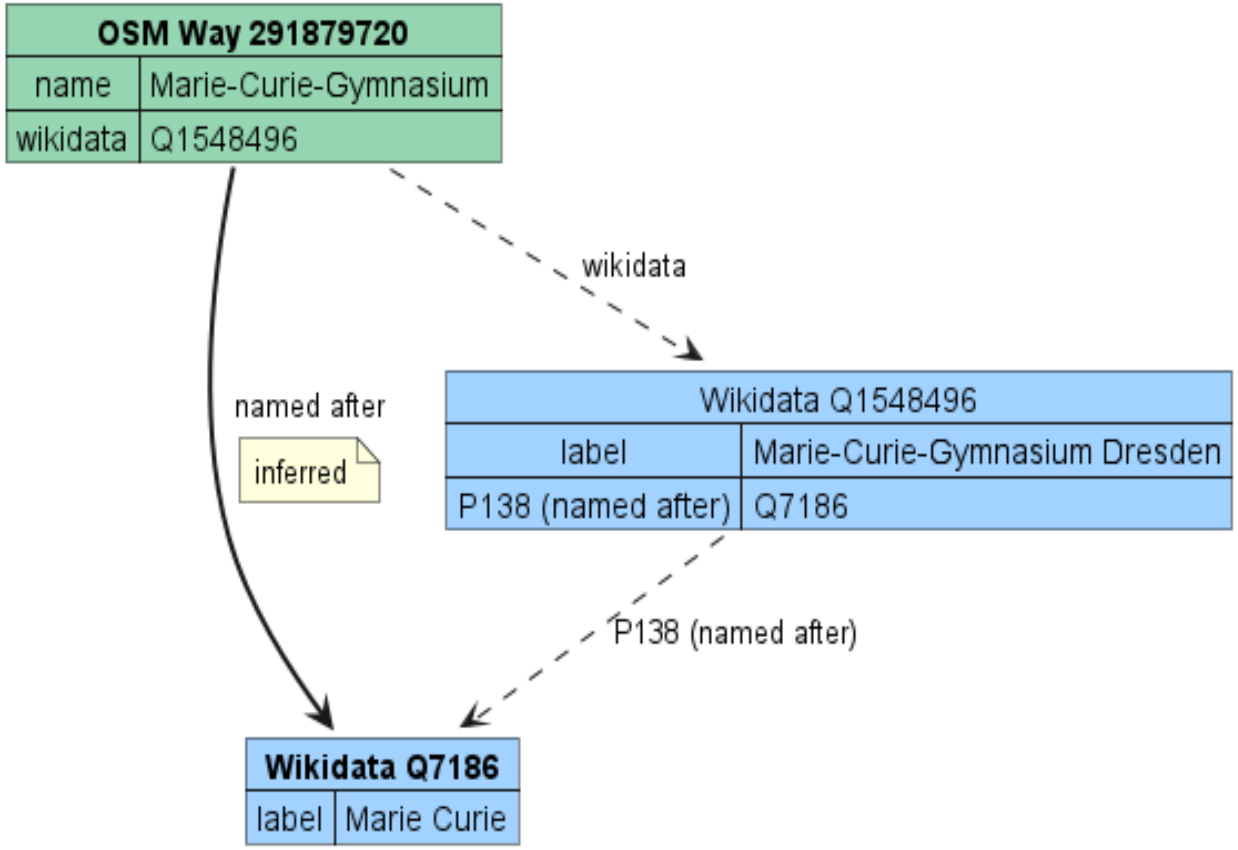
Ex:

- artist_name=* => artist:wikidata=*
- brand=* => brand:wikidata=*
- subject=* => subject:wikidata=*
- model=* => model:wikidata=*
- architect=* => architect:wikidata=*
- ...



OSM wikidata=* + Wikidata properties

Combine OSM **wikidata=*** and a Wikidata property to find the Wikidata item **describing a certain aspect** of the OSM element



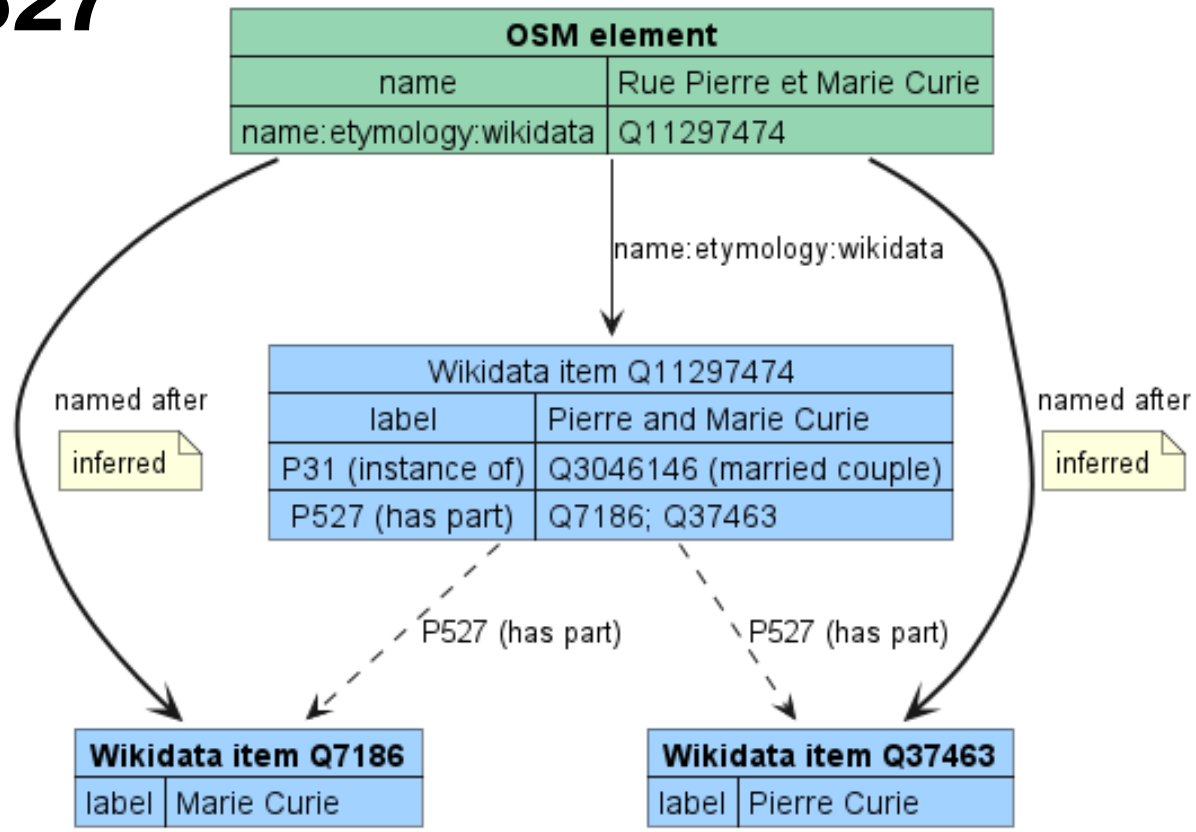
OSM *:wikidata=* + P527

Q-ID of the Wikidata item **describing a certain aspect** of the OSM element.

Use **«has part(s)»** (**P527**) to include **parts of the linked entity**.

Ex:

Williams sisters (Q1180052) = Serena W. (Q11459) + Venus W. (Q11578)



Tools, editors and viewers

- OSM <-> Wikidata matcher
- MapComplete (etymology, ...)
- i18n of labels of vector tiles by Mapbox and MapTiler
- I18n of geocoding by Nominatim, Mapbox and MapTiler
- JOSM + “Wikipedia” extension
- iD + Name Suggestion Index
- Sophox
- OWL Map
- OSM-Wikipedia tag validator
- OSM-Wikidata Map Framework (OWMF)

There's much more!

Explore more about OSM and Wikidata in these talks that will take place in the Plenary Hall during the afternoon:

- "OpenStreetMap and Wikimedia: Awesome Together!" by Eugene Alvin Villar, Dennis Raylin Chen
- "Giving Contexts to Places We Love - The Power of OpenStreetMap and Wikidata" by James Amattey

What is OSM-Wikidata Map Framework

Tool for creating data-driven maps based on OSM and Wikidata.

Allows you to **use the above patterns** choosing OSM tags and Wikidata properties.

Basic mode: APIs only (Overpass and Wikidata), no DB necessary, simple patterns only.

Advanced mode: with DB (to be initialized), Advanced patterns and propagations.

Uses Docker+ PHP + PostGIS; Apache Airflow + Osmium; Typescript + MapLibre GL JS

Examples in action: Open Etymology Map , Open Burial Map, Open Artist Map

Configure OWMF (APIs only, no DB)

1. `$ curl -o .env https://gitlab.com/openetymologymap/osm-wikidata-map-framework/-/raw/main/.env.example`

2. Edit .env customizing tags and properties

- osm_wikidata_keys, osm_text_key & osm_description_key
- osm_wikidata_properties
- wikidata_indirect_property & wikidata_image_property

3. `$ docker run --rm --env-file ".env" -p "80:80/tcp" "registry.gitlab.com/openetymologymap/osm-wikidata-map-framework:latest"`

OWMF is now available on localhost

Complete guide here

Configure OWMF (with DB)

1. `$ git clone https://gitlab.com/openetymologymap/osm-wikidata-map-framework.git`
2. Copy **.env.example** in **.env** and customize tags and properties
3. In .env enable the DB (**db_enable=true**) and change its password (**db_password**)
4. Make sure ports 80, 5432 and 8080 are free
5. `$ docker-compose --profile airflow --profile airflow-init up -d`
6. Launch the DB initialization from Apache Airflow (localhost:8080)
7. `$ docker-compose --profile prod up --d`

OWMF is now available on localhost

Demo

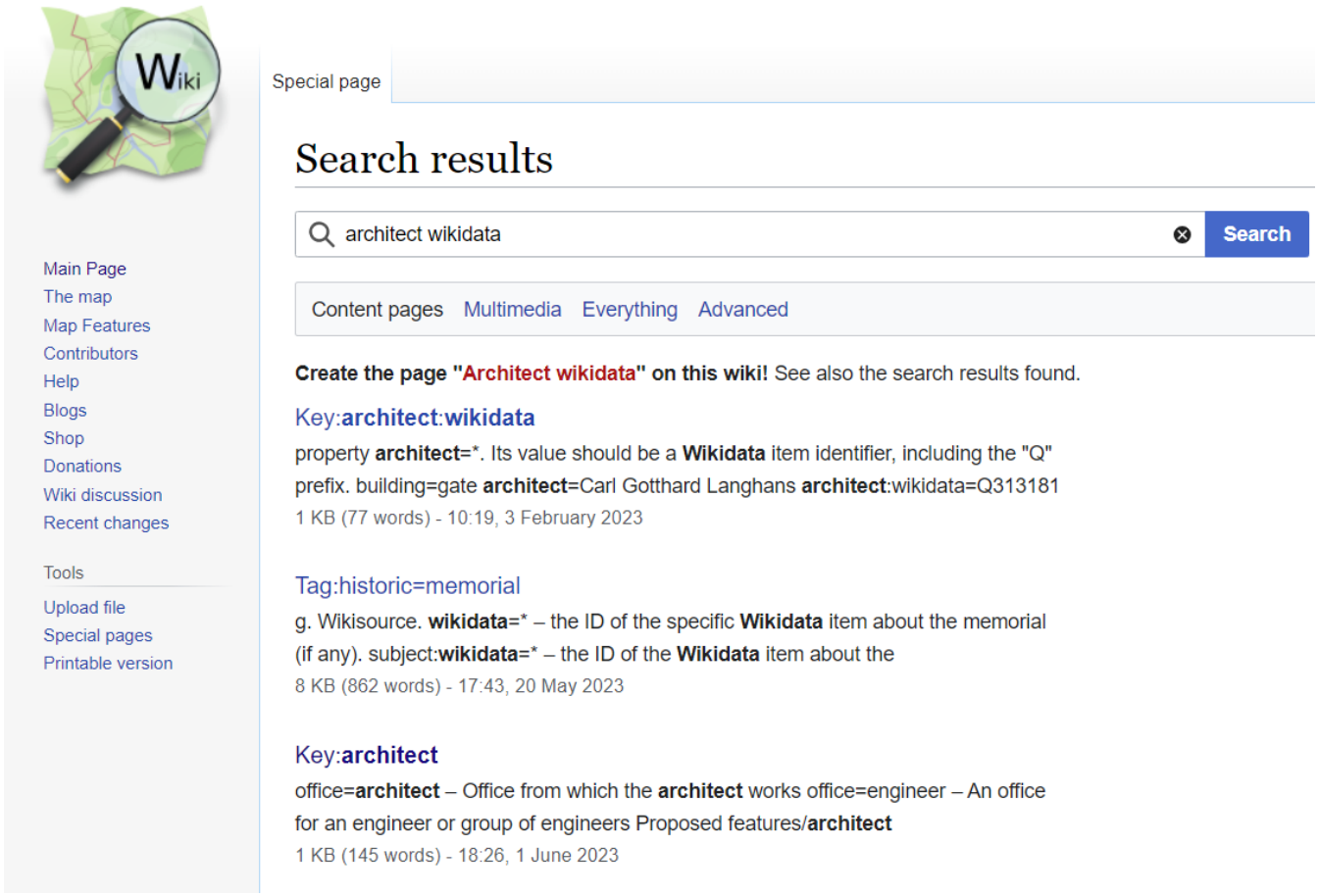
Creating an application based on OWMF

Find the OSM tags

[Search on OSM Wiki]

Ex: architect of a building

- architect=*
- architect:wikidata=*

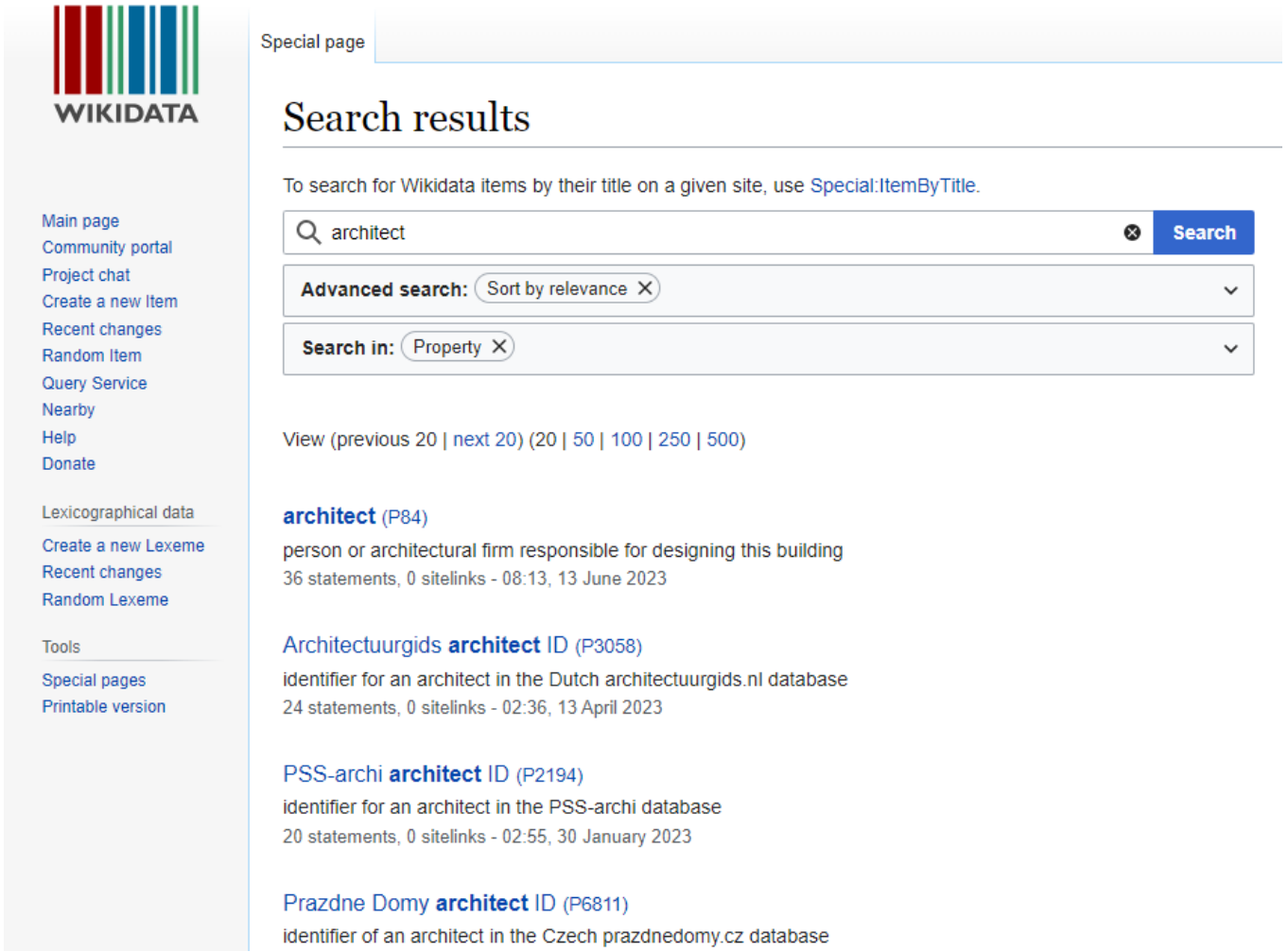


Find the Wikidata properties

Search on Wikidata limiting to the «Property» namespace

Ex: architect of a building

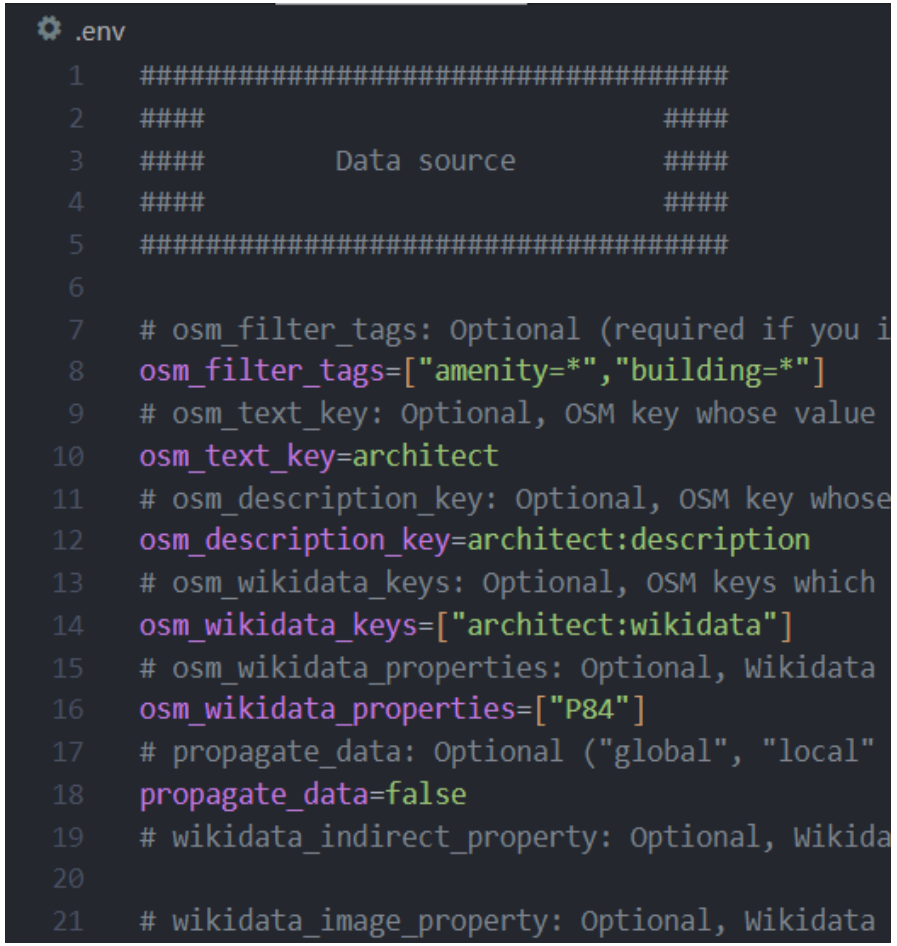
- «architect» (P84)



Configure .env (APIs only / no DB)

Download the default configuration (.env.example) into the file “.env” *.

Then apply the found tags and properties into the .env file.



* `$ curl -o .env https://gitlab.com/openetymologymap/osm-wikidata-map-framework/-/raw/main/.env.example`

Start OWMF (APIs only / no DB)

```
$ docker run --rm --env-file ".env" -p "80:80/tcp" "registry.gitlab.com/openetymologymap/osm-wikidata-map-framework:latest"
```

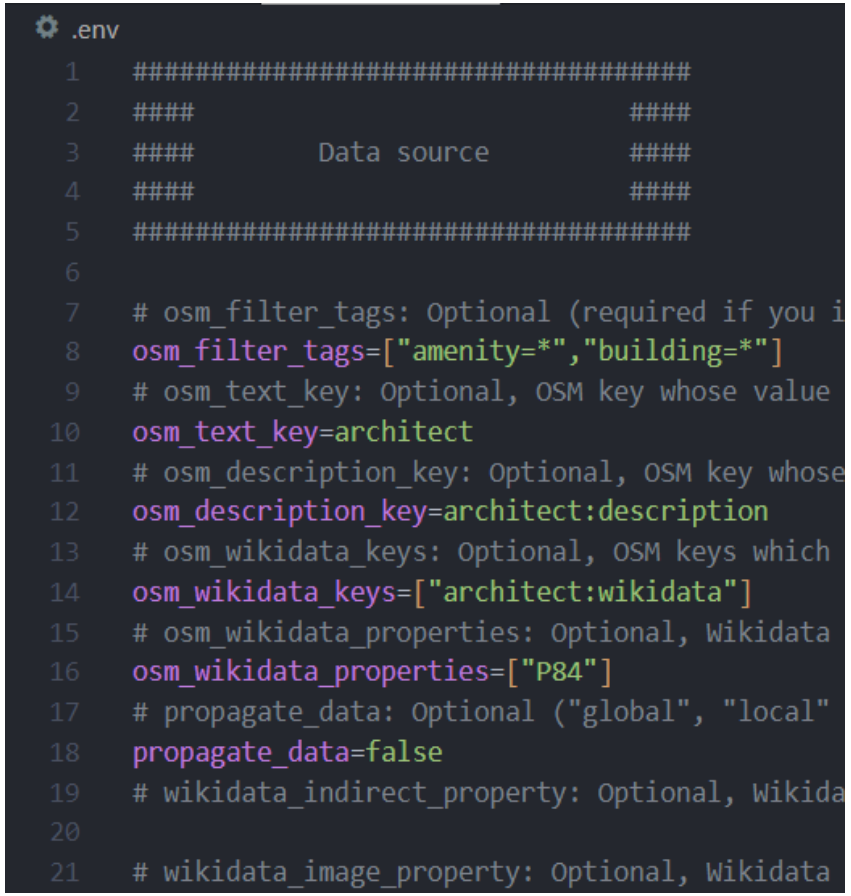
```
PS C:\Users\daniele.santini\Documents\owmf-demo> docker run --rm --env-file ".env" -p "80:80/tcp" "registry.gitlab.com/openetymologymap/osm-wikidata-map-framework:latest"
AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 172.17.0.2. Set the 'ServerName' directive globally to suppress this message
[Sun Aug 13 18:56:16.371687 2023] [security2:notice] [pid 1] ModSecurity for Apache/2.9.7 (http://www.modsecurity.org/) configured.
[Sun Aug 13 18:56:16.372966 2023] [security2:notice] [pid 1] ModSecurity: APR compiled version="1.7.2"; loaded version="1.7.2"
[Sun Aug 13 18:56:16.372969 2023] [security2:notice] [pid 1] ModSecurity: PCRE2 compiled version="10.42 "; loaded version="10.42 2022-12-11"
[Sun Aug 13 18:56:16.372970 2023] [security2:notice] [pid 1] ModSecurity: LUA compiled version="Lua 5.1"
[Sun Aug 13 18:56:16.372970 2023] [security2:notice] [pid 1] ModSecurity: YAJL compiled version="2.1.0"
[Sun Aug 13 18:56:16.372971 2023] [security2:notice] [pid 1] ModSecurity: LIBXML compiled version="2.9.14"
[Sun Aug 13 18:56:16.372972 2023] [security2:notice] [pid 1] ModSecurity: Status engine is currently disabled, enable it by set SecStatusEngine to On.
AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 172.17.0.2. Set the 'ServerName' directive globally to suppress this message
[Sun Aug 13 18:56:16.444891 2023] [mpm_prefork:notice] [pid 1] AH00163: Apache/2.4.57 (Debian) PHP/8.2.8 OpenSSL/3.0.9 configured -- resuming normal operations
[Sun Aug 13 18:56:16.444919 2023] [core:notice] [pid 1] AH00094: Command line: 'apache2 -D FOREGROUND'
```

Configure .env (with DB)

Download the OWMF repository and copy the default configuration (.env.example) into the file “.env” *.

Then apply the found tags and properties into the .env file.

Then set `db_enable=true` .




```
* $ git clone https://gitlab.com/openetymologymap/osm-wikidata-map-framework.git
  $ cp .env.example .env
```

Start Airflow and OWMF (with DB)

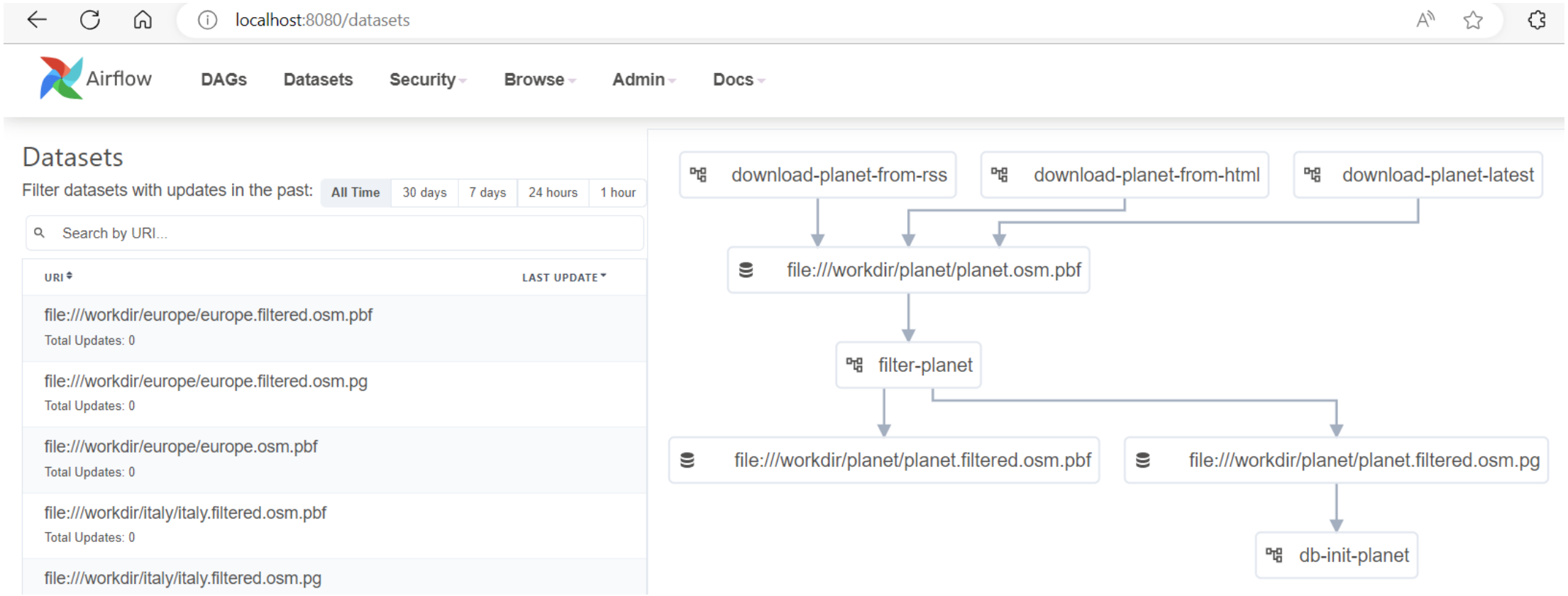
```
$ docker-compose --profile airflow --profile airflow-init up -d
```

Run the DB initialization pipeline

```
$ docker-compose --profile prod up --d
```

```
PS C:\Users\daniele.santini> cd .\Documents\personal\osm-wikidata-map-framework\
PS C:\Users\daniele.santini\Documents\personal\osm-wikidata-map-framework> docker-compose --profile airflow-init --profile airflow up -d
[+] Running 14/14
 - Network osm-wikidata-map-framework_airflow-torrent-bridge  Created
 - Network osm-wikidata-map-framework_airflow-internal        Created
 - Network osm-wikidata-map-framework_pgadmin-bridge          Created
 - Network osm-wikidata-map-framework_oem-internal            Created
 - Network osm-wikidata-map-framework_airflow-postgis-bridge  Created
 - Container osm-wikidata-map-framework-postgres-1            Healthy
 - Container osm-wikidata-map-framework-redis-1               Healthy
 - Container osm-wikidata-map-framework-torrent-daemon-1      Started
 - Container osm-wikidata-map-framework-oem-postgis-1         Started
 - Container osm-wikidata-map-framework-airflow-init-1        Exited
 - Container osm-wikidata-map-framework-airflow-scheduler-1   Started
 - Container osm-wikidata-map-framework-airflow-triggerer-1   Started
 - Container osm-wikidata-map-framework-airflow-worker-1      Started
 - Container osm-wikidata-map-framework-airflow-webserver-1   Started
PS C:\Users\daniele.santini\Documents\personal\osm-wikidata-map-framework> docker-compose --profile prod up -d
[+] Running 4/4
 - Volume "osm-wikidata-map-framework_apache-sites-available"  Created
 - Volume "osm-wikidata-map-framework_apache-sites-enabled"    Created
 - Volume "osm-wikidata-map-framework_letsencrypt-certs"       Created
 - Container osm-wikidata-map-framework-oem-web-prod-1         Started
PS C:\Users\daniele.santini\Documents\personal\osm-wikidata-map-framework>
```

Datasets and DAGs in Airflow (with DB)



Result

Singapore Flyer

Wikimedia Commons - Public domain - Waycool27 at English Wikipedia

Kisho Kurokawa

Japanese architect (1934-2007)

Kisho Kurokawa was a leading Japanese architect and one of the founders of the Metabolist Movement.

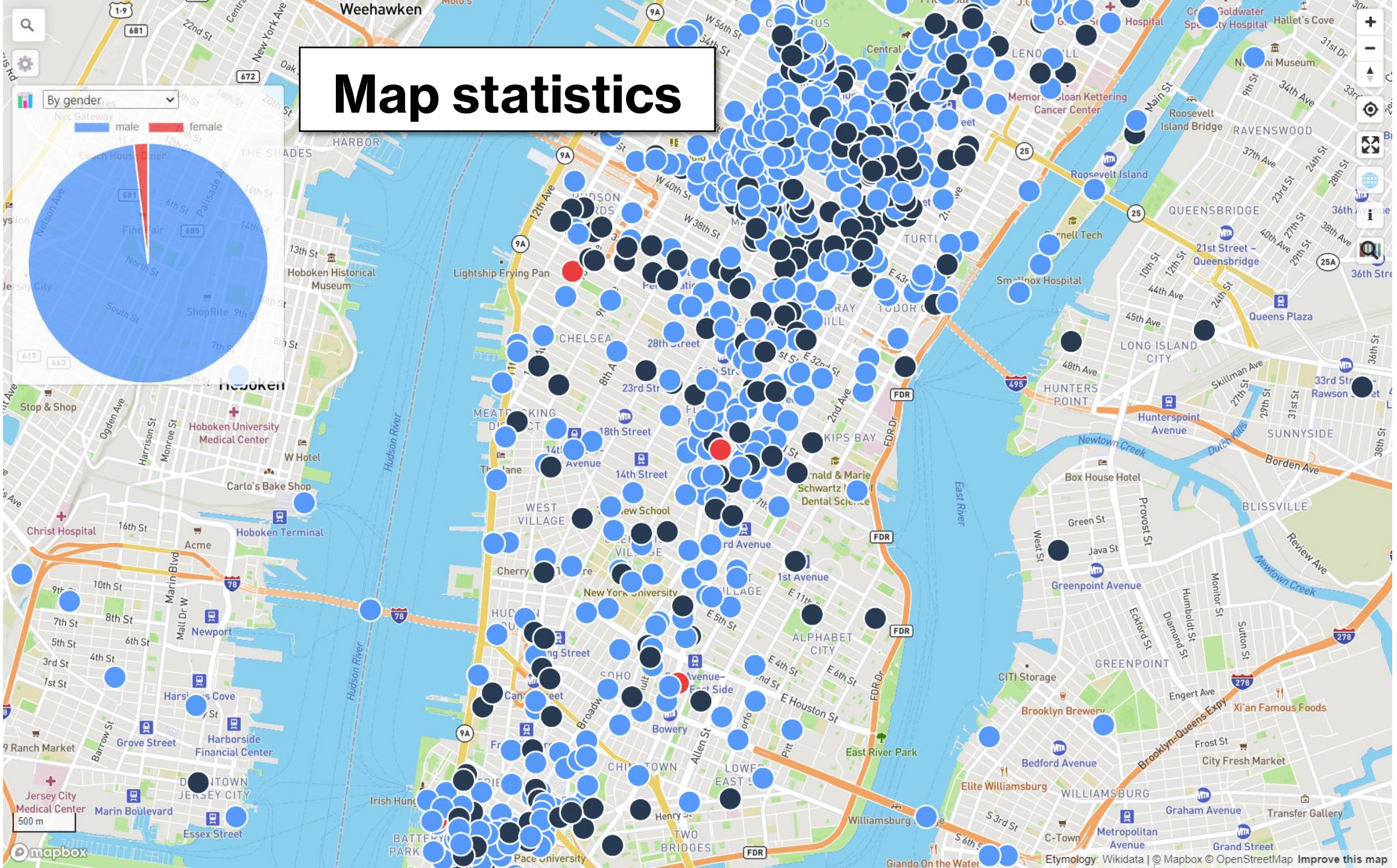
4/8/1934 (Kanie) - 10/12/2007 (Kawadachō)

Japan, Empire of Japan

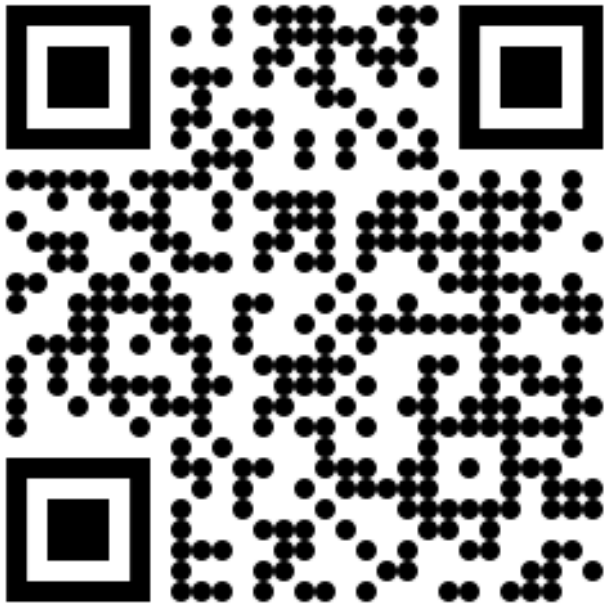
male

businessman, thinker, architect, political activist

Map statistics



Thank you for your attention!



dsantini.it/owmf.pdf