



OpenStreetMap

Laboratorio di cartografia digitale / 2

Introduzione a OpenStreetMap: accesso ai dati ed elaborazione

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Indice

- Estrazione (OSM, OSM API, OVERPASS)
- Export / Import (geojson.io, QGIS, PostGIS)
- Elaborazione dati

```
graph TD; A[OpenStreetMap] --> B[ELABORAZIONE]; B --> C[VISUALIZZAZIONE];
```

ELABORAZIONE

VISUALIZZAZIONE

Estrazione dati

<http://www.openstreetmap.org>

The screenshot shows the OpenStreetMap interface. At the top left, the search bar contains the text "santa maria novella", which is circled in red. A red arrow points from this search bar to the "SEARCH" button on the map. Below the search bar, a "Search Results" panel is open, displaying a list of search results. A cyan arrow points from the "RESULTS" label on the map to the search results panel. The map itself shows a street view of Florence, Italy, with various landmarks and buildings. The search results are as follows:

Search Results
Results from OpenStreetMap Nominatim
Place of Worship Santa Maria Novella, Via del Ponte Medioevale, Bracciano Due, Bracciano, RM, Lazio, 00062, Italy
Hotel Santa Maria Novella, Piazza Santa Maria Novella, Quartiere 1, Florence, Metropolitan City of Florence, Tuscany, 50123, Italy
Bus Stop Santa Maria Novella, Piazza degli Ottaviani, Quartiere 1, Florence, Metropolitan City of Florence, Tuscany, 50123, Italy
Chemist Santa Maria Novella, Piccadilly, St. James's, Mayfair, Westminster, London, Greater London, England, W1J 9EF, United Kingdom
Perfumery Santa Maria Novella, 20, Bolshaya Dmitrovka St, Суцѣбо, Tverskoy District, Central Administrative Okrug, Moscow, Central Federal District, 115054, Russia
Place of Worship Santa Maria Novella, Via Santa Maria Novella, Montelparo, Fermo, Marche, 63853, Italy
Beauty Shop Santa Maria Novella, Calle del Almirante,

ESTRAZIONE DATI / 1

L'interfaccia di OpenStreetMap

ESERCIZIO: aprire l'interfaccia di OSM da un browser, utilizzare la funzionalità SEARCH per cercare risultati (per esempio "santa maria novella"). Visualizzare i risultati sulla SX passandoci sopra il mouse e cliccando.

<http://www.openstreetmap.org>

The screenshot displays the OpenStreetMap web interface. At the top, there are navigation links for 'Edit', 'History', and 'Export', along with utility links for 'GPS Traces', 'User Diaries', 'Copyright', 'Help', and 'About'. On the right side, there are 'Log In' and 'Sign Up' buttons. The main interface is divided into a search panel on the left and a map on the right. The search panel includes a search bar with the text 'Where is this?' and a 'Go' button. Below the search bar, there are two sections: 'Query Features' and 'Nearby features'. The 'Nearby features' section lists several items: 'Tree #4407221544', 'Tree #4407221547', 'Grass #116866781', 'Place of Worship **Basilica Santa Maria Novella**', and 'Building 18 Piazza di Santa Maria Novella'. The 'Enclosing features' section lists: 'Place of Worship Basilica Santa Maria Novella', 'Suburb Boundary Quartiere 1', 'City Boundary Florence', and 'County Boundary Metropolitan City of Florence'. The map on the right shows a street view of Florence, Italy, centered on the Basilica Santa Maria Novella. A red circle highlights the 'Query Features' button in the bottom right corner of the map. A blue arrow points from the 'Query Features' button to the 'Query Features' section in the search panel. A pink arrow points from the 'Query Features' button to the 'Basilica Santa Maria Novella' entry in the 'Nearby features' list. The word 'RESULTS' is written in large blue letters over the map area.

https://www.openstreetmap.org/way/449369047

ESTRAZIONE DATI / 1 L'interfaccia di OpenStreetMap

ESERCIZIO: aprire l'interfaccia di OSM da un browser, centrare la mappa in situazioni differenti (centro città, aperta campagna, cima di un monte noto) e cliccare sul tasto di esplorazione (query features)

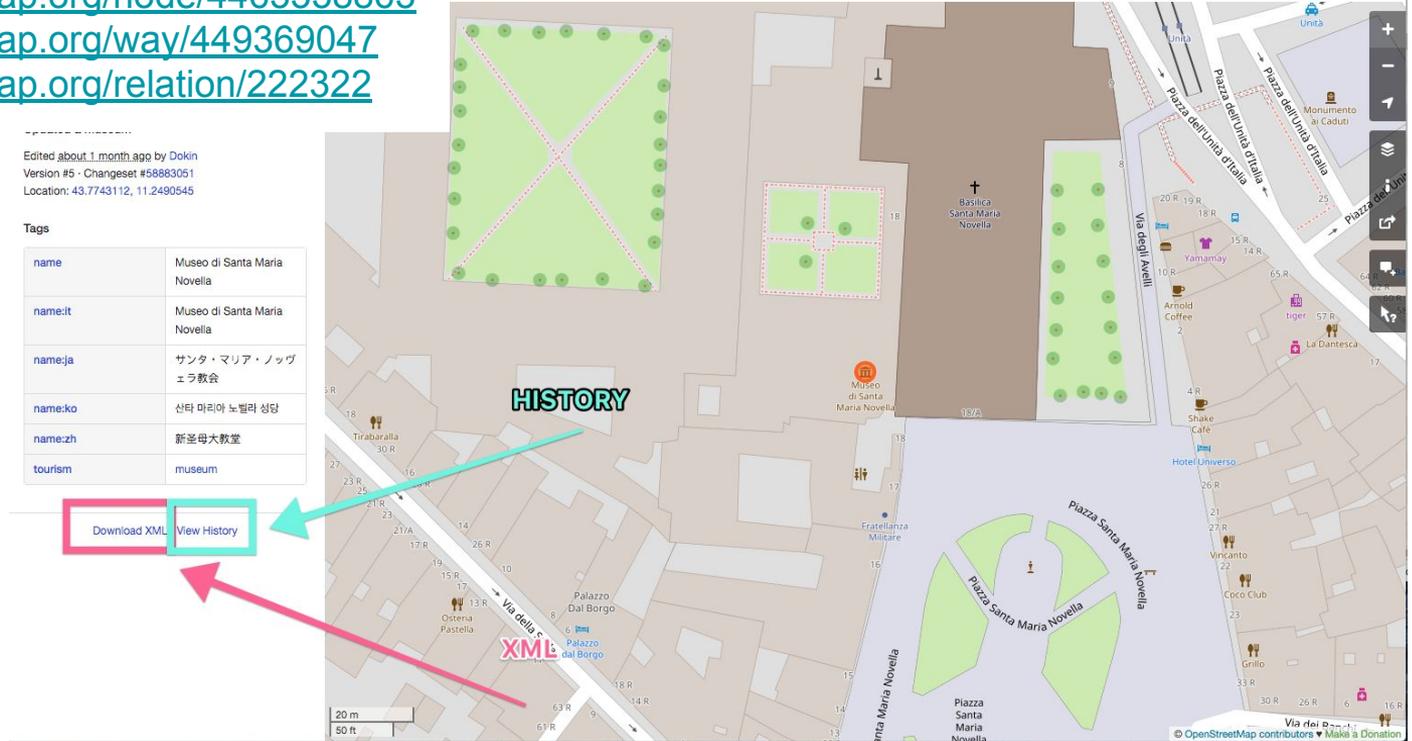
<https://www.openstreetmap.org/node/4463338863>
<https://www.openstreetmap.org/way/449369047>
<https://www.openstreetmap.org/relation/222322>

Edited about 1 month ago by Dokin
Version #5 - Changeset #58883051
Location: 43.7743112, 11.2490545

Tags

name	Museo di Santa Maria Novella
name:it	Museo di Santa Maria Novella
name:ja	サンタ・マリア・ノヴヅ エラ教会
name:ko	산타 마리아 노벨라 성당
name:zh	新圣母大教堂
tourism	museum

Download XML View History



ESTRAZIONE DATI / 2 Le API di OSM

ESERCIZIO: Una volta identificato un elemento nei risultati della ricerca o del query features cliccare sull'elemento e visualizzarlo nella mappa (farlo per un node, per una way e per una relation)

<https://www.openstreetmap.org/node/4463338863/history>

<https://www.openstreetmap.org/way/449369047/history>

<https://www.openstreetmap.org/relation/222322/history>

Updated a museum

Edited *about 1 month ago* by Dokin
Version #5 · Changeset #58883051
Location: 43.7743112, 11.2490545

Tags

name	Museo di Santa Maria Novella
name:it	Museo di Santa Maria Novella
name:ja	サンタ・マリア・ノヴェラ教会
name:ko	산타 마리아 노벨라 성당
name:zh	新圣母大教堂
tourism	museum

Created an artwork, an attraction, and a car rental. Updated 7 parking, 4 attractions

Museo di Santa Maria Novella

Basilica Santa Maria Novella

Fratellanza Militare

ESTRAZIONE DATI / 2
Le API di OSM

ESERCIZIO: Visualizzare la history (CHANGELOG) degli elementi precedentemente visualizzati su OSM

<https://www.openstreetmap.org/api/0.6/node/4463338863>

<https://www.openstreetmap.org/api/0.6/way/449369047>

<https://www.openstreetmap.org/api/0.6/relation/222322>

```
▼<osm version="0.6" generator="CGImap 0.6.0 (15383 thorn-01.openstreetmap.org)" copyright="OpenStreetMap and contributors" attribution="http://www.openstreetmap.org/copyright" license="http://opendatacommons.org/licenses/odbl/1-0/">
  ▼<node id="4463338863" visible="true" version="5" changeset="58883051" timestamp="2018-05-11T16:10:26Z" user="Dokin" uid="8256963" lat="43.7743112" lon="11.2490545">
    <tag k="name" v="Museo di Santa Maria Novella"/>
    <tag k="name:it" v="Museo di Santa Maria Novella"/>
    <tag k="name:ja" v="サンタ・マリア・ノヴェラ教会"/>
    <tag k="name:ko" v="산타 마리아 노벨라 성당"/>
    <tag k="name:zh" v="新圣母大教堂"/>
    <tag k="tourism" v="museum"/>
  </node>
</osm>
```

ESTRAZIONE DATI / 2

Le API di OSM

ESERCIZIO: Visualizzare la API di dettaglio di un singolo elemento in formato XML

<https://www.openstreetmap.org/api/0.6/way/449369047/full>

<https://www.openstreetmap.org/api/0.6/relation/222322/full>

```
<?osm version="0.6" generator="CGImap 0.6.0 (17958 thorn-02.openstreetmap.org)" copyright="OpenStreetMap and contributors"
attribution="http://www.openstreetmap.org/copyright" license="http://opendatacommons.org/licenses/odbl/1-0/">
<node id="269997209" visible="true" version="6" changeset="43157399" timestamp="2016-10-25T12:55:50Z" user="Pab09" uid="178610" lat="43.7742095" lon="11.2495537"/>
<node id="269997212" visible="true" version="5" changeset="43157399" timestamp="2016-10-25T12:55:49Z" user="Pab09" uid="178610" lat="43.7747999" lon="11.2495789"/>
<node id="269997214" visible="true" version="6" changeset="43157399" timestamp="2016-10-25T12:55:49Z" user="Pab09" uid="178610" lat="43.7748013" lon="11.2498028"/>
<node id="269997215" visible="true" version="5" changeset="43157399" timestamp="2016-10-25T12:55:49Z" user="Pab09" uid="178610" lat="43.7750924" lon="11.2496663"/>
<node id="269997216" visible="true" version="5" changeset="43157399" timestamp="2016-10-25T12:55:49Z" user="Pab09" uid="178610" lat="43.7750949" lon="11.2494966"/>
<node id="269997218" visible="true" version="6" changeset="54602201" timestamp="2017-12-13T17:09:29Z" user="mau59" uid="257767" lat="43.7751387" lon="11.2494956"/>
<node id="269997219" visible="true" version="6" changeset="54602201" timestamp="2017-12-13T17:09:30Z" user="mau59" uid="257767" lat="43.7751428" lon="11.2492907"/>
<node id="269997225" visible="true" version="7" changeset="43157399" timestamp="2016-10-25T12:55:50Z" user="Pab09" uid="178610" lat="43.7742174" lon="11.2491407"/>
<node id="1280019709" visible="true" version="2" changeset="43157399" timestamp="2016-10-25T12:55:49Z" user="Pab09" uid="178610" lat="43.7749968" lon="11.2496637"/>
<node id="1280019714" visible="true" version="2" changeset="43157399" timestamp="2016-10-25T12:55:49Z" user="Pab09" uid="178610" lat="43.7749924" lon="11.2497650"/>
<node id="1315184193" visible="true" version="2" changeset="43157399" timestamp="2016-10-25T12:55:50Z" user="Pab09" uid="178610" lat="43.7750962" lon="11.2492891"/>
<node id="4463338851" visible="true" version="1" changeset="43157399" timestamp="2016-10-25T12:55:46Z" user="Pab09" uid="178610" lat="43.7749119" lon="11.2490489"/>
<node id="4463338853" visible="true" version="1" changeset="43157399" timestamp="2016-10-25T12:55:46Z" user="Pab09" uid="178610" lat="43.7747578" lon="11.2490371"/>
<node id="4463338854" visible="true" version="1" changeset="43157399" timestamp="2016-10-25T12:55:46Z" user="Pab09" uid="178610" lat="43.7750359" lon="11.2492874"/>
<node id="4463338856" visible="true" version="1" changeset="43157399" timestamp="2016-10-25T12:55:46Z" user="Pab09" uid="178610" lat="43.7747511" lon="11.2491806"/>
<node id="4463338857" visible="true" version="1" changeset="43157399" timestamp="2016-10-25T12:55:46Z" user="Pab09" uid="178610" lat="43.7750424" lon="11.2491161"/>
<node id="4463338878" visible="true" version="1" changeset="43157399" timestamp="2016-10-25T12:55:47Z" user="Pab09" uid="178610" lat="43.7749705" lon="11.2491323"/>
<node id="4463338884" visible="true" version="1" changeset="43157399" timestamp="2016-10-25T12:55:47Z" user="Pab09" uid="178610" lat="43.7749089" lon="11.2491279"/>
<node id="4463339295" visible="true" version="1" changeset="43157399" timestamp="2016-10-25T12:55:47Z" user="Pab09" uid="178610" lat="43.7750382" lon="11.2492062"/>
<node id="4463339305" visible="true" version="1" changeset="43157399" timestamp="2016-10-25T12:55:47Z" user="Pab09" uid="178610" lat="43.7749714" lon="11.2491094"/>
<node id="4463339313" visible="true" version="1" changeset="43157399" timestamp="2016-10-25T12:55:47Z" user="Pab09" uid="178610" lat="43.7742300" lon="11.2491403"/>
<?way id="449369047" visible="true" version="6" changeset="58902443" timestamp="2018-05-12T13:24:48Z" user="Alecs01" uid="1476146">
<nd ref="1315184193"/>
<nd ref="4463338854"/>
<nd ref="4463339295"/>
<nd ref="4463338857"/>
<nd ref="4463339305"/>
<nd ref="4463338878"/>
<nd ref="4463338884"/>
<nd ref="4463338851"/>
<nd ref="4463338853"/>
<nd ref="4463338856"/>
<nd ref="4463339313"/>
<nd ref="269997225"/>
<nd ref="269997209"/>
<nd ref="269997212"/>
<nd ref="269997214"/>
<nd ref="1280019714"/>
<nd ref="1280019709"/>
<nd ref="269997215"/>
<nd ref="269997216"/>
<nd ref="269997218"/>
<nd ref="269997219"/>
```

ESTRAZIONE DATI / 2

Le API di OSM

ESERCIZIO: Visualizzare la API di dettaglio full di un singolo elemento (di tipo way o relation) in formato XML

relation 222322

VD Via degli Dei

Show on map GPX KML

percorso escursionistico che collega le città di Bologna e Firenze, passando attraverso gli Appennini. Percorribile sia a piedi che in mountain bike.

Mapped length: 123 km
Operator: Club Alpino Italiano

Elevation profile

Route is potentially unordered or incomplete. Elevation information might be inaccurate.

Altitude (m)

Distance (km)

Accumulated ascent: 4440 m
Accumulated descent: 4225 m

OpenStreetMap tags

description	percorso escursionistico che collega le città di Bologna e Firenze, passando attraverso gli Appennini. Percorribile sia a piedi che in mountain bike.
name	Via degli Dei
network	rwn
operator	Club Alpino Italiano
osm:symbol	red:yellow_circle:yellow_dot:VD:black
ref	VD
route	hiking

ESTRAZIONE DATI / 2
Le API di OSM

ESERCIZIO: Visualizzare una relation con
WAYMARKEDTRAILS

Relation analysis

Relation ID : [Analyze](#)
 Always download relation from OSM Server (no cache).

Relation ID: [222322](#) | Relation Name: [Via degli Dei](#) | Relation Type: [route](#) | Length in KM: [123.012](#)

Last modified: [one day ago](#), edited by: [hypersciocco](#)

[Show all tags](#) [Analyze on map](#) [Browse](#)

Great! This relation seems ok.
This relation can be connected as one piece.

[Show more info ...](#)

Way distribution



Shows the distribution of way types in this relations. Hover over a color for more details.
red = major roads, blue = rural roads, brown = tracks, green = footways and cycleways, gray = unknown

[Download](#)

Surface distribution



Shows the distribution of way surfaces in this relations. Hover over a color for more details.
solid = paved, dashed = unpaved, blue = no surface tag on way

ESTRAZIONE DATI / 2
Le API di OSM

ESERCIZIO: Visualizzare una relation con OSM
RELATION ANALYZER

Retrieving map data by bounding box: GET /api/0.6/map

The following command returns:

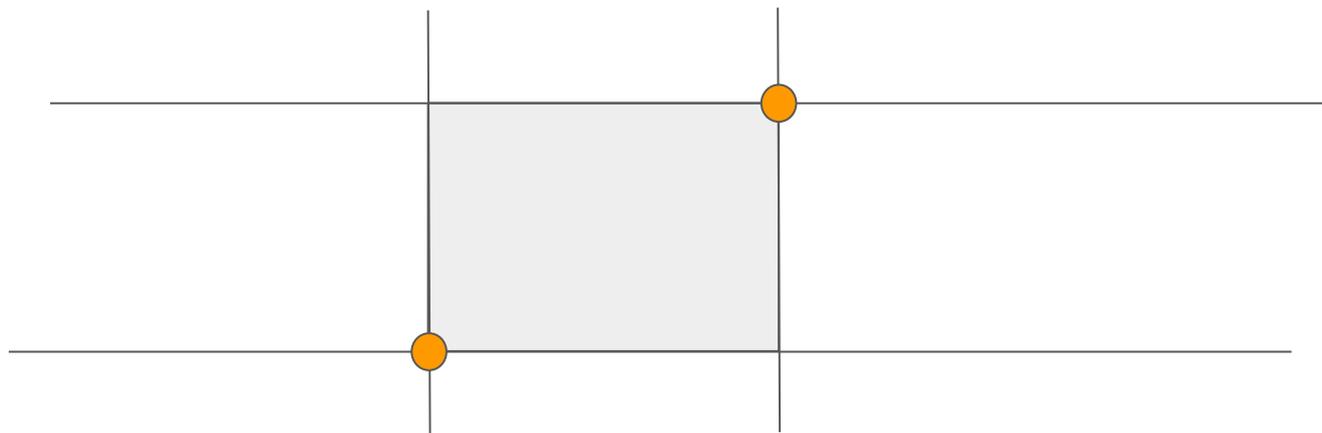
- All nodes that are inside a given bounding box and any relations that reference them.
- All ways that reference at least one node that is inside a given bounding box, any relations that reference them [the ways], and any nodes outside the bounding box that the ways may reference.
- All relations that reference one of the nodes, ways or relations included due to the above rules. (Does **not** apply recursively, see explanation below.)

```
GET /api/0.6/map?bbox=left,bottom,right,top
```

ESTRAZIONE DATI / 2
Le API di OSM

ESERCIZIO: Scaricare una porzione di mappa di una zona ristretta attorno alla sede di svolgimento della lezione.

<https://www.openstreetmap.org/api/0.6/map?bbox=left,bottom,right,top>



ESTRAZIONE DATI / 2
Le API di OSM

ESERCIZIO: Scaricare una porzione di mappa di una zona ristretta attorno alla sede di svolgimento della lezione.

BoundingBox Georeferencer | MapRank Search | Old Maps Online

Find a place with OpenStreetMap ...

SEARCH

BBOX

RESULTS

Copy & Paste Always include bounding box

CSV

© MapTiler © OpenStreetMap contributors

Copyright © 2017 [Klokantech](#) - Software applications for libraries and archives. [Contact us](#).

```
map.osm
1 <?xml version="1.0" encoding="UTF-8"?>
2 <osm version="0.6" generator="CGImap 0.6.0 (17985 thorn-02.openstreetmap.org)" copyright="OpenStreetMap and
  contributors" attribution="http://www.openstreetmap.org/copyright" license="http://opendatacommons.
  org/licenses/odbl/1-0/">
3 <bounds minlat="43.8077971" minlon="11.2323068" maxlat="43.8104951" maxlon="11.2350048"/>
4 <node id="1533964" visible="true" version="7" changeset="52772175" timestamp="2017-10-09T20:45:35Z" user="
  hypersciocco" uid="90188" lat="43.8075884" lon="11.2338494"/>
5 <node id="1533966" visible="true" version="2" changeset="24746211" timestamp="2014-08-14T13:56:52Z" user="Kurly" uid
  ="967832" lat="43.8095081" lon="11.2336426"/>
6 <node id="1533967" visible="true" version="15" changeset="59282046" timestamp="2018-05-25T20:52:07Z" user="mau59"
  uid="257767" lat="43.8101644" lon="11.2335902"/>
7 <node id="1533973" visible="true" version="3" changeset="53427713" timestamp="2017-11-01T15:51:06Z" user="mau59" uid
  ="257767" lat="43.8111661" lon="11.2312831"/>
8 <node id="270056613" visible="true" version="3" changeset="25266036" timestamp="2014-09-06T12:38:11Z" user="Pab09"
  uid="178610" lat="43.8109626" lon="11.2337971"/>
9 <node id="270056614" visible="true" version="3" changeset="25266036" timestamp="2014-09-06T12:38:11Z" user="Pab09"
  uid="178610" lat="43.8111992" lon="11.2337998"/>
10 <node id="270056615" visible="true" version="2" changeset="19789339" timestamp="2014-01-03T16:03:41Z" user="
  Pucciotrex30" uid="1801173" lat="43.8114008" lon="11.2337610"/>
11 <node id="270057386" visible="true" version="1" changeset="148897" timestamp="2008-06-13T09:09:16Z" user="grampasso"
  uid="17383" lat="43.8108736" lon="11.2316301"/>
12 <node id="270058549" visible="true" version="5" changeset="24125664" timestamp="2014-07-13T17:47:23Z" user="ppong it
  " uid="1747341" lat="43.8110339" lon="11.2314252"/>
13 <node id="270058633" visible="true" version="5" changeset="33222803" timestamp="2015-08-09T16:42:55Z" user="
  Pucciotrex30" uid="1801173" lat="43.8116089" lon="11.2335014"/>
14 <node id="270058682" visible="true" version="4" changeset="33222803" timestamp="2015-08-09T16:42:55Z" user="
  Pucciotrex30" uid="1801173" lat="43.8107423" lon="11.2327583"/>
```

ESTRAZIONE DATI / 2 Le API di OSM

ESERCIZIO: Scaricare una porzione di mappa di una zona ristretta attorno alla sede di svolgimento della lezione.



- Main Page
- The map
- Map Features
- Contributors
- Help
- Blogs
- Shop
- Donations
- Recent changes
- Tools
- What links here
- Related changes
- Special pages
- Printable version
- Permanent link
- Page information
- Cite this page

API v0.6

Available languages — API v0.6

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API v0.6 is the *current* version of the OSM Editing API deployed 17-21 April 2009.

This page was updated in March 2012 to reflect small changes applied since then, in April 2013 after the addition of the Map Notes API and in January 2016 after the addition of changeset discussions.

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 - 1.1 URL + authentication
 - 1.1.1 Error codes
 - 1.2 Elements
 - 1.3 Changesets
 - 1.4 Tags
 - 1.5 Maximum string lengths
 - 1.6 Reliably identifying users
 - 1.7 Version numbers/optimistic locking
 - 1.8 XML Format
 - 1.9 Faking the correct HTTP methods

ESTRAZIONE DATI / 2
Le API di OSM

Documentazione sulle API di OSM (v 0.6)

The screenshot displays the Overpass Turbo web application interface. On the left, a code editor shows a query for drinking water points. The main area features a map of Florence, Italy, with numerous blue circular markers indicating water points. A 'Query Wizard' dialog box is open in the center, containing the query 'amenity=drinking_water' and a list of usage examples. The interface includes a menu bar at the top with options like 'Run', 'Share', 'Export', 'Wizard', 'Save', 'Load', 'Settings', and 'Help'. A status bar at the bottom right of the map area shows 'Loaded - nodes: 68, ways: 0, relations: 0' and 'Displayed - pois: 68, lines: 0, polygons: 0'.

```
1  /*
2  This has been generated by the overpass-turbo wizard.
3  The original search was:
4  "amenity=drinking_water"
5  */
6  [out:json][timeout:25];
7  // gather results
8  (
9  // query part for: "amenity=drinking_water"
10 node["amenity"="drinking_water"](((bbox)));
11 way["amenity"="drinking_water"](((bbox)));
12 relation["amenity"="drinking_water"](((bbox)));
13 );
14 // print results
15 out body;
16 >;
17 out skel qt;
```

Query Wizard

amenity=drinking_water

The **wizard** assists you with creating Overpass queries. Here are some usage examples:

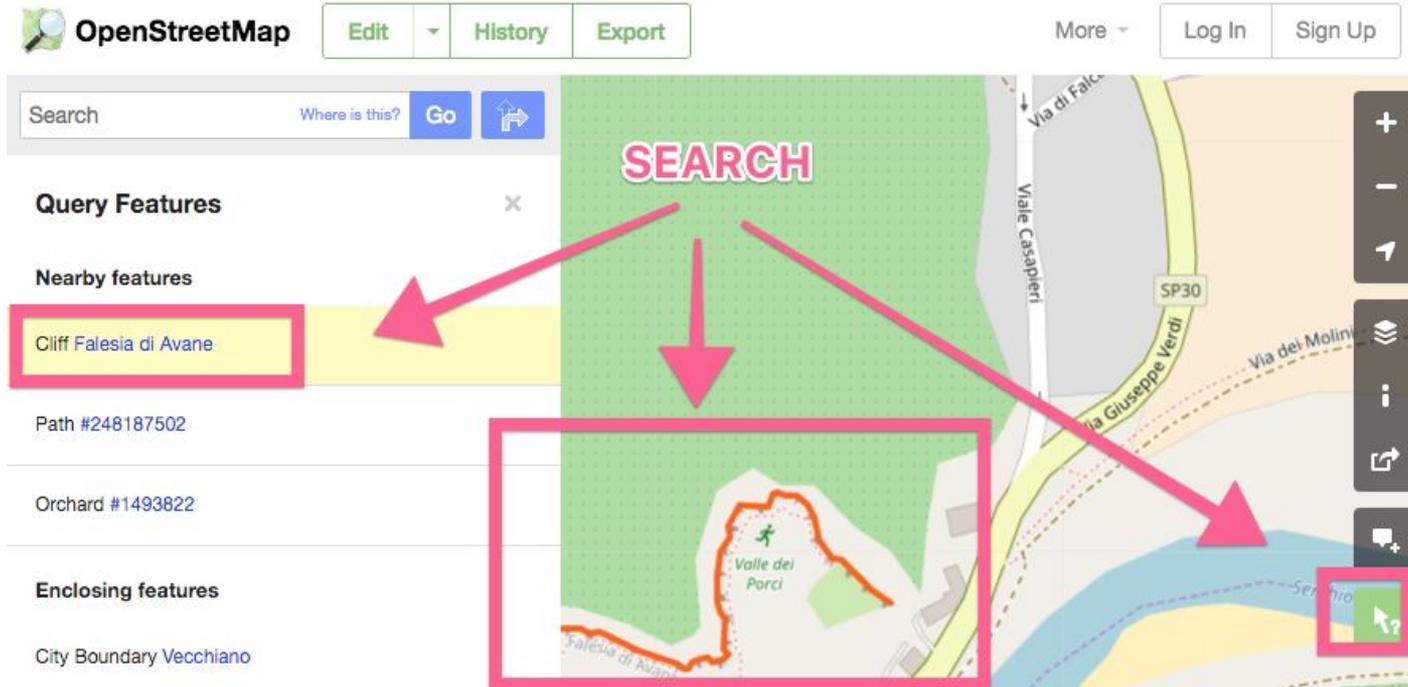
- Drinking Water
- highway=* and type:way
- tourism=museum in Vienna

build query build and run query cancel

Loaded - nodes: 68, ways: 0, relations: 0
Displayed - pois: 68, lines: 0, polygons: 0

ESTRAZIONE DATI / 3 OVERPASS TURBO

ESERCIZIO: Trovare tutte le fontane attorno di una particolare zona usando il WIZARD di OVERPASS TURBO



ESTRAZIONE DATI / 3 OVERPASS TURBO

ESERCIZIO: Trovare tutte le falesie di arrampicata di una zona. **Da OSM interfaccia trovo una elemento come quello che cerco.** Guardo i TAG. Uso i TAG per effettuare una query su OVERPASS.

The screenshot shows the OpenStreetMap interface. At the top, there are navigation buttons: 'Edit', 'History', and 'Export'. Below that, a search bar and a 'Go' button. The main content area is split into a left sidebar and a right map view.

Way: Falesia di Avane (215304016)

fix tag

Edited 3 months ago by Mariusz Staniszewski
Version #7 · Changeset #57255615

Tags

climbing:grade:french: max	7c+
climbing:grade:french: min	3a
climbing:rock	limestone
climbing:sport	200
name	Falesia di Avane
natural	cliff
sport	climbing

The map view shows a green area with a red line representing a climbing route. Two red arrows point from the 'natural:cliff' and 'sport:climbing' tags in the sidebar to the corresponding 'TAG' labels on the map. The map also shows a river, a road labeled 'Viale Casapieri', and a castle labeled 'Castello di Rosaiole'.

ESTRAZIONE DATI / 3 OVERPASS TURBO

ESERCIZIO: Trovare tutte le falesie di arrampicata di una zona. Da OSM interfaccia trovo una elemento come quello che cerco. **Guardo i TAG.** Uso i TAG per effettuare una query su OVERPASS.

Run Share Export Wizard Save Load Settings Help overpass turbo

```
1 /*
2 This has been generated by the overpass-turbo
3 wizard.
4 The original search was:
5 "sport=climbing"
6 */
7 [out:json][timeout:25];
8 // gather results
9 (
10 // query part for: "sport=climbing"
11 node["sport"="climbing"]({{bbox}});
12 way["sport"="climbing"]({{bbox}});
13 relation["sport"="climbing"]({{bbox}});
14 );
15 // print results
16 out body;
17 >;
18 out skel qt;
```

Loaded - nodes: 240, ways: 3, relations: 0
Displayed - pois: 184, lines: 3, polygons: 0

ESTRAZIONE DATI / 3 OVERPASS TURBO

ESERCIZIO: Trovare tutte le falesie di arrampicata di una zona. Da OSM interfaccia trovo una elemento come quello che cerco. Guardo i TAG. **Uso i TAG per effettuare una query su OVERPASS.**



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Overpass turbo/Wizard

[<](#) [Overpass turbo](#)

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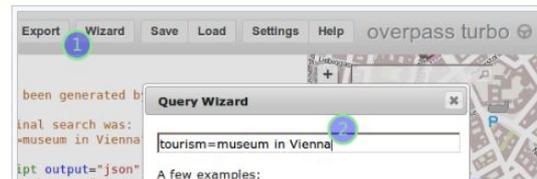
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ESTRAZIONE DATI / 3
OVERPASS TURBO

Documentazione di OVERPASS TURBO WIZARD

Import dati

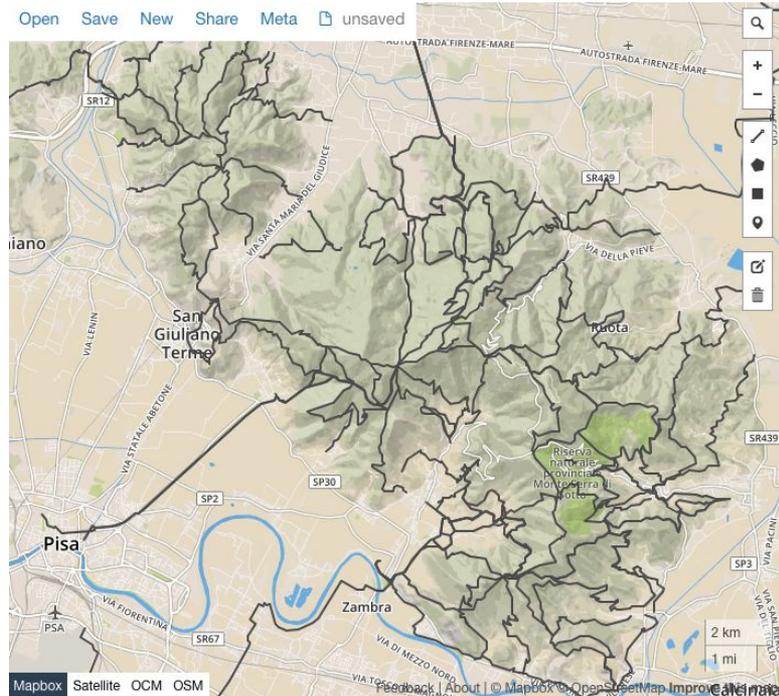
<http://geojson.io>

```
1 {  
2   "type": "FeatureCollection",  
3   "features": [  
4     {  
5       "type": "Feature",  
6       "geometry": {  
7         "type": "LineString",  
8         "coordinates": [  
9           [  
10            8.3438506,  
11            44.2124258  
12          ],  
13          [  
14            8.3438432,  
15            44.2123767  
16          ],  
17          [  
18            8.3438451,  
19            44.2123329  
20          ],  
21          [  
22            8.3438395,  
23            44.2122692  
24          ],  
25          [  
26            8.3438413,  
27            44.212236
```

IMPORT DATI / 1
<http://geojson.io>

ESERCIZIO: Importare le falesie di arrampicata. Riprendo la query di Overpass per le falesie. Uso la funzionalità export per scaricare localmente i dati. Trascino il file su geojson.io

<http://geojson.io>



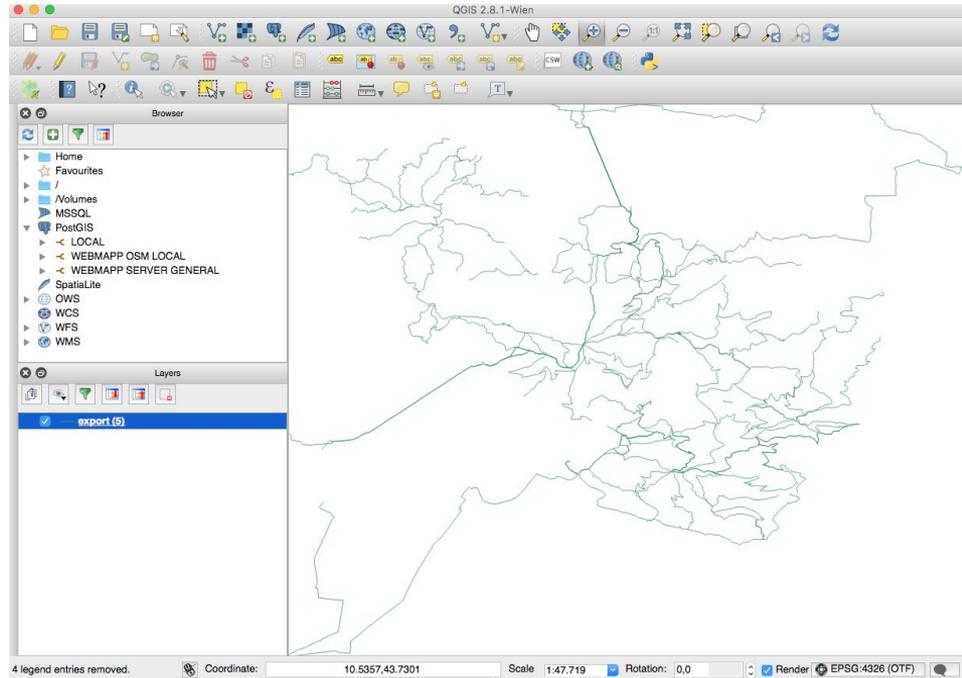
```
</> JSON Table ? Help anon | login
1 {
2   "type": "FeatureCollection",
3   "features": [
4     {
5       "type": "Feature",
6       "geometry": {
7         "type": "GeometryCollection",
8         "geometries": [
9           {
10            "type": "LineString",
11            "coordinates": [
12              [
13                10.8084655,
14                43.7291402
15              ],
16              [
17                10.8086824,
18                43.7290535
19              ],
20              [
21                10.8088381,
22                43.72898
23              ],
24              [
25                10.8089796,
26                43.7289222
27              ],

```

IMPORT DATI / 1
<http://geojson.io>

ESERCIZIO: Importare un gruppo di sentieri su geojson.io

<https://www.qgis.org/it/site/>



IMPORT DATI / 2
QGIS

ESERCIZIO: Importare un gruppo di sentieri su QGIS

<https://postgis.net/>

<https://www.gnu.org/software/wget/>

<https://wiki.openstreetmap.org/wiki/Osm2pgsql>

> **wget** -O temp.osm

<https://www.openstreetmap.org/api/0.6/map?bbox=11.2323068197,43.8077971197,11.2350047803,43.8104950803>

> **osm2pgsql** -c -d osm_lc -U webmapp -H localhost --number-processes 8 --hstore temp.osm

--style /mnt/volume-fra1-01/europaosm/openstreetmap.style

PRIMA DI INIZIARE:

> psql

> create role webmapp superuser login password '*****';

> create database osm_lc owner webmapp ;

> \connect osm_lc

> create extension postgis ;

> create extension hstore ;

> \q

IMPORT DATI / 3
POSTGIS

ESERCIZIO: Importare un file .osm Visualizzare i risultati con QGIS con una connessione a POSTGIS. Esplorare le tabelle create.

Elaborazione dati


```
[out:xml][timeout:1200];
{{geocodeArea:Firenze}}->.searchArea;
(
  node["operator"="ATAF"](area.searchArea);
  way["operator"="ATAF"](area.searchArea);
  relation["operator"="ATAF"](area.searchArea);
);
// print results
(._;>);
out meta;
```

IMPORT DATI / 3
POSTGIS

ESERCIZIO: Creare una mappa delle autolinee ATAF di Firenze con numero della linea riportato e con base CTR 10K

Grazie!



OpenStreetMap

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Geo Nerd