

Abstract geometric lines in black on a white background, forming various polygons and intersecting lines, primarily located in the upper left and center of the page.

# OPEN STREET MAP I POSTGIS PROJEKAT

Ana Milenković 1524

# SADRŽAJ

Opis projekta

Podaci

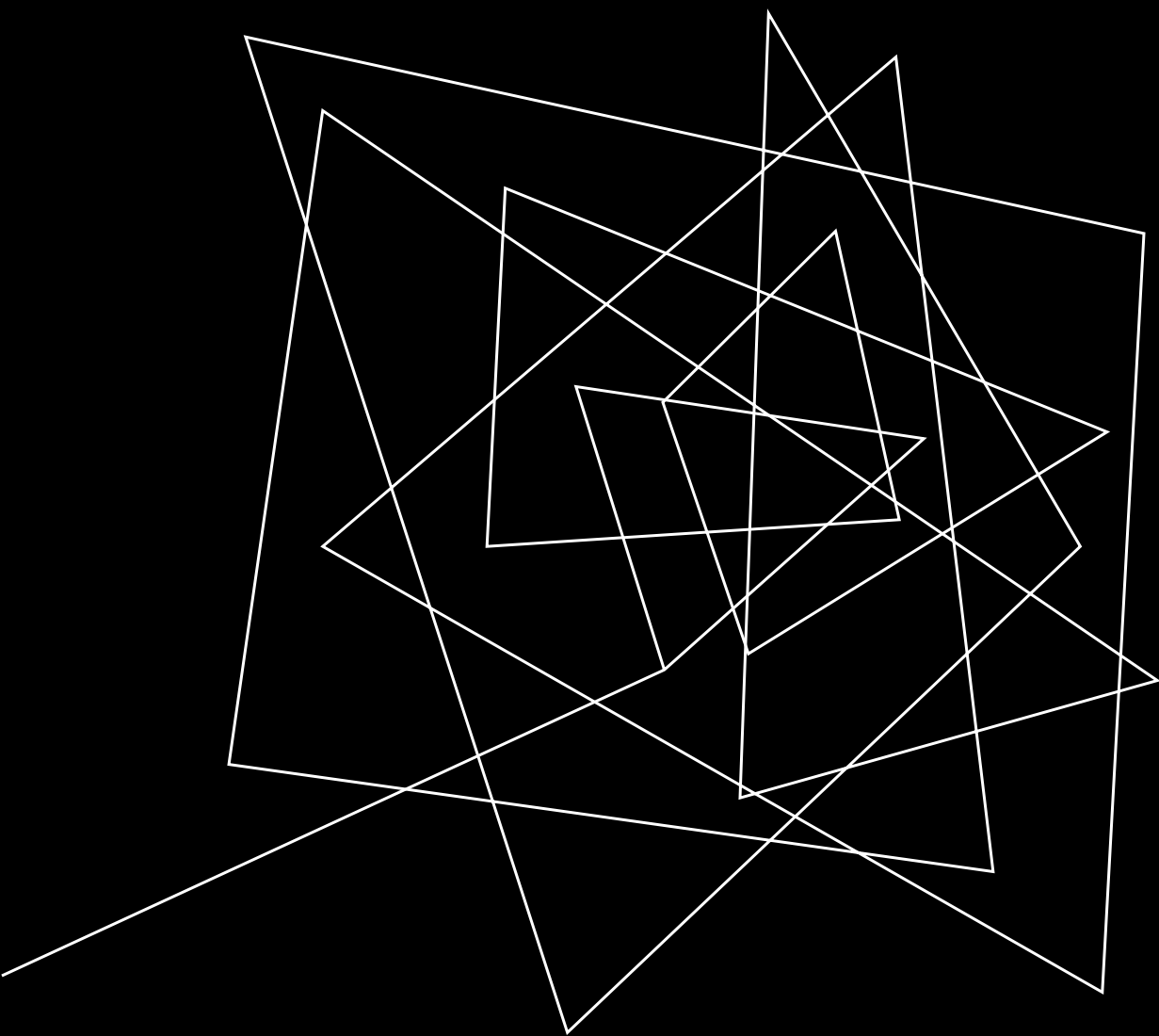
QGIS

Upiti

# OPIS PROJEKTA

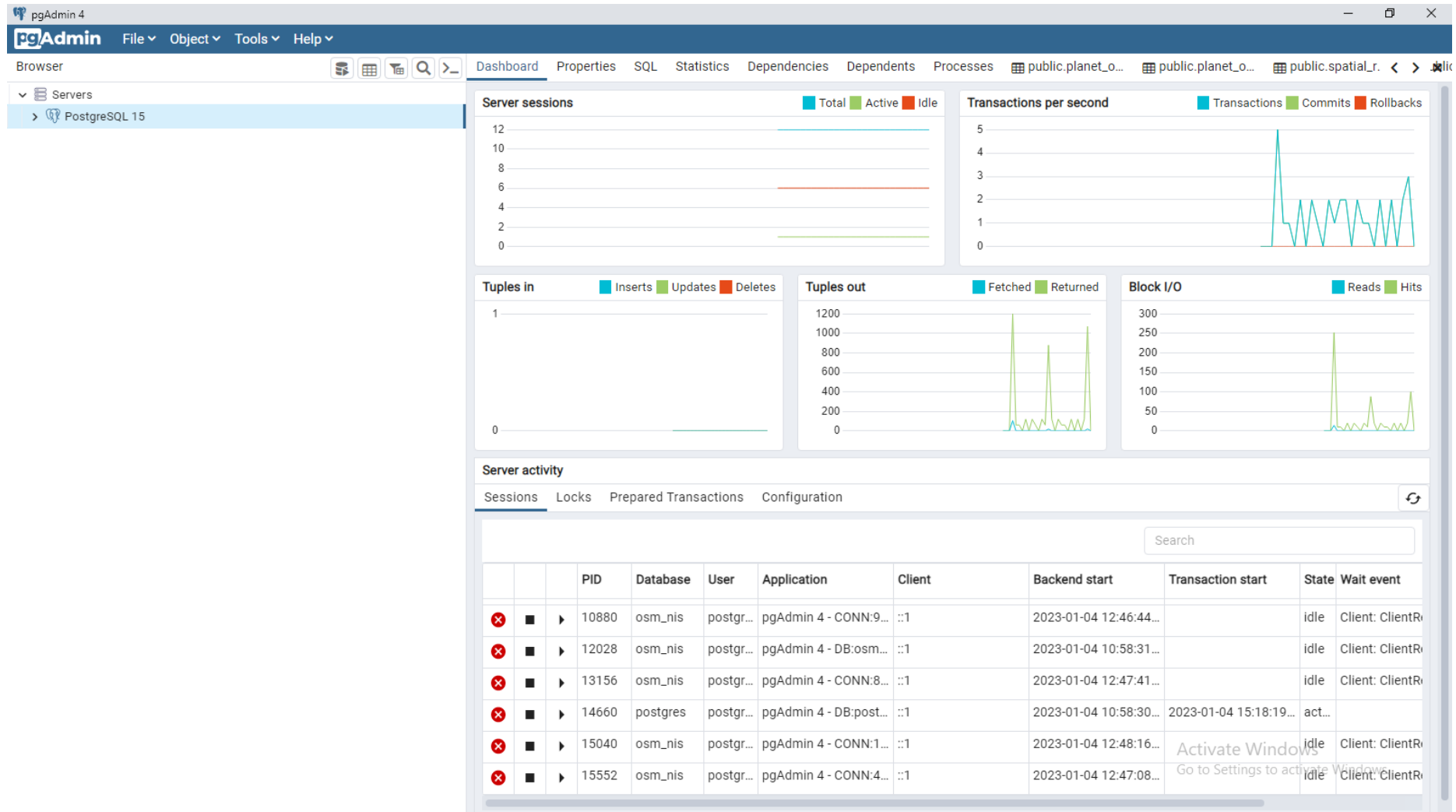
U okviru projekta, odrađeno je sledeće:

- Instaliran QGIS
- Instaliran PostgreSQL
- Dodati PostGIS, osm2pgsql, shp2pgsql-gui
- Eksport-ovani podaci u shp i osm.pbf formatu sa odgovarajućih online alata
- Isti ti podaci import-ovani u PostgreSQL
- Izvršeni upiti nad bazom



ALATI I DODACI

# POSTGRESQL





# POSTGRESQL

PostgreSQL je relacionalna baza korišćena za čuvanje geoprostornih podataka. Za pristup bazi i izvršenje akcija nad njom (kao što je kreiranje nove baze, novih korisnika, podešavanja) korišćen je pgAdmin 4 grafički interfejs.

# POSTGIS

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## Compiling from Source

PostGIS has many packaged installations, but if you are more adventurous and want to compile your own, refer to our source download and compilation instructions:

- [Source Download and Compile Instructions](#)

## Binary Installers

Binary distributions of PostGIS are available for various operating systems.

### Docker

PostGIS has a community [docker-postgis](#) project. Production ready PostGIS Docker builds can be pulled from [PostGIS docker hub](#)

### Windows

## Getting Started

In order to use PostGIS you first need to [install the binaries](#). You can install these via package managers or compile PostGIS yourself.

### Enabling PostGIS

PostGIS is an optional extension that must be enabled in each database you want to use it in before you can use it. Installing the software is just the first step. DO NOT INSTALL it in the database called `postgres`.

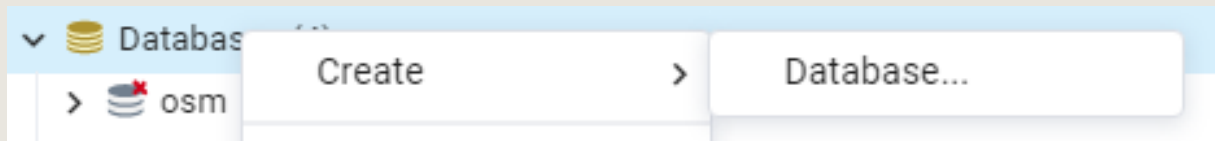
Connect to your database with `psql` or PgAdmin. Run the following SQL. You need only install the features you want:

```
-- Enable PostGIS (as of 3.0 contains just geometry/geography)
CREATE EXTENSION postgis;
-- enable raster support (for 3+)
CREATE EXTENSION postgis_raster;
```

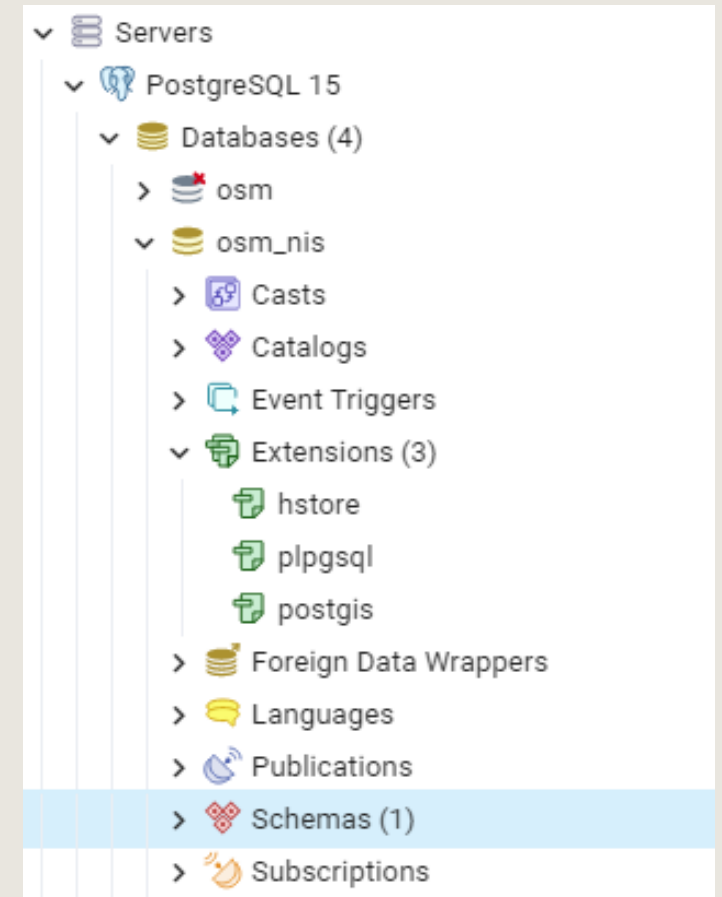
POSTGRES

# BAZA

Za potrebe projekta, u pgAdmin-u kreirana je baza osm\_nis

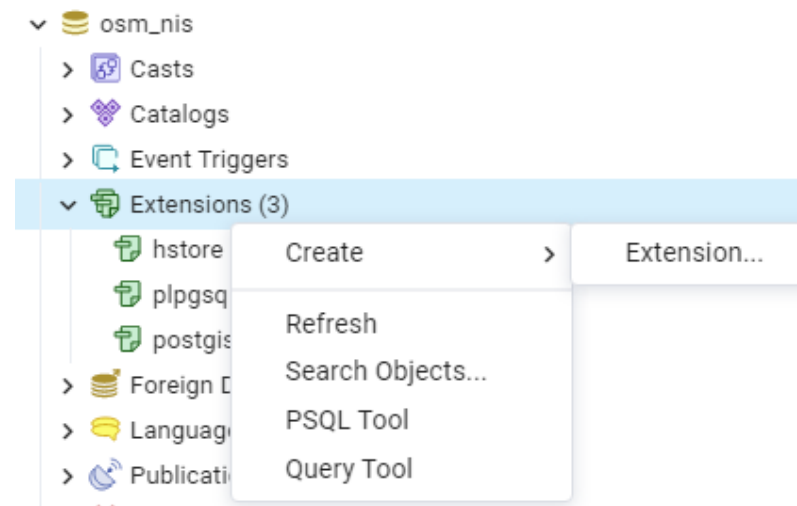


## osm\_nis





Dodate su ekstenzije: postgis i hstore



Create - Extension

General Definition SQL

Name postgis

Comment

Create - Extension

General Definition SQL

Name hstore

Comment

# OSM2PGSQL DODATAK

Osm2pgsql omogućava import-ovanje .osm.pbf podataka u PostgreSQL

osm2pgsql

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## OSM2PGSQL

### About

Osm2pgsql imports  $\rightarrow$  OpenStreetMap (OSM) data into a PostgreSQL/PostGIS database. It is an essential part of many rendering toolchains, the Nominatim geocoder and other applications processing OSM data.

### News

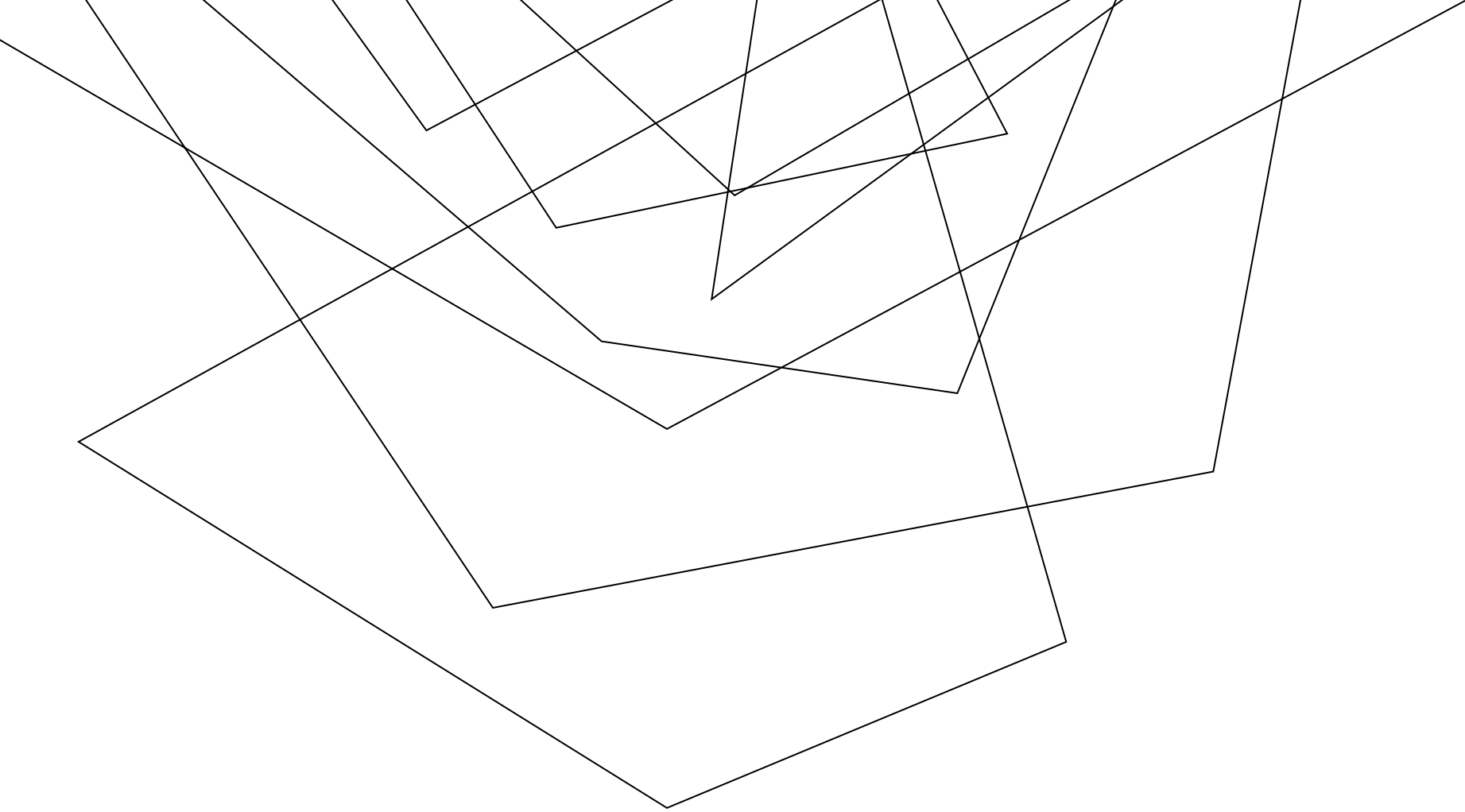


10 Nov 2022: [Release 1.7.2](#)

23 Oct 2022: [Timings and sizes](#)

05 Oct 2022: [Release 1.7.1](#)

04 Oct 2022: [Book release](#)







PODACI


# EKSPORTOVANJE PODATAKA – OSM.PBF


Bbbike.org


en de fr ru - intro - about



Format   
Protocolbuffer (PBF)  1,126 km<sup>2</sup>


Name of area to extract  or search  ~2 MB  
City of Niš, Nisava Administrative District, Central Ser

Your email address   
ana.milenkovic@elfak.rs 2 min

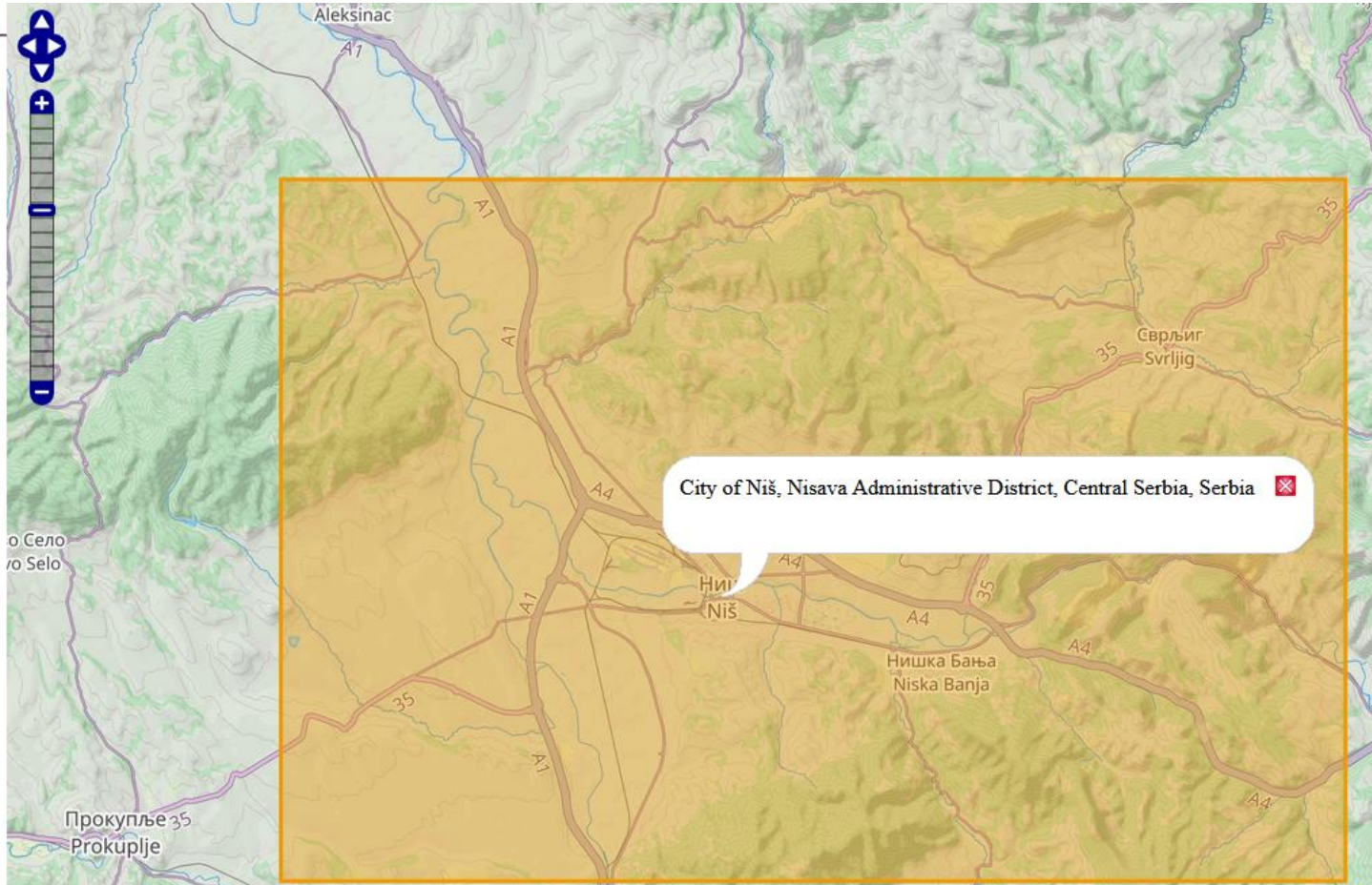
Select a different area 




☐ add points to polygon  

☒ resize or drag polygon 

To change the polygon, you have to first click on it and then you can move, resize or extend it. Please press the extract button after you are done with polygone creation.



# EKSPORTOVANJE PODATAKA - SHP

 **EXPORT TOOL**

CreateExportsConfigsAboutLearnSupportEnglishLog Out

Nis\_Serbia\_Test

Description:

Id:acc2d945-76dd-482c-97b0-bae78993c03b

Project:

Area:210 sq km

Created at:Tuesday, January 3rd 2023, 3:21 pm

Created by:ana\_faks

Published:Yes

Export formats:Shapefile.shp

OSM Analytics:[View this area](#)

FeaturesRe-RunCloneDelete

Tuesday, January 3rd 2023, 3:22 pm

Status:COMPLETED

ID:3d0a1317-f91b-4b7f-bdcf-057e04053450

Finished:Tuesday, January 3rd 2023, 3:22 pm

Duration:a few seconds

Shapefile.shpNis-Serbia-Test\_shp.zip(2.79 MB)

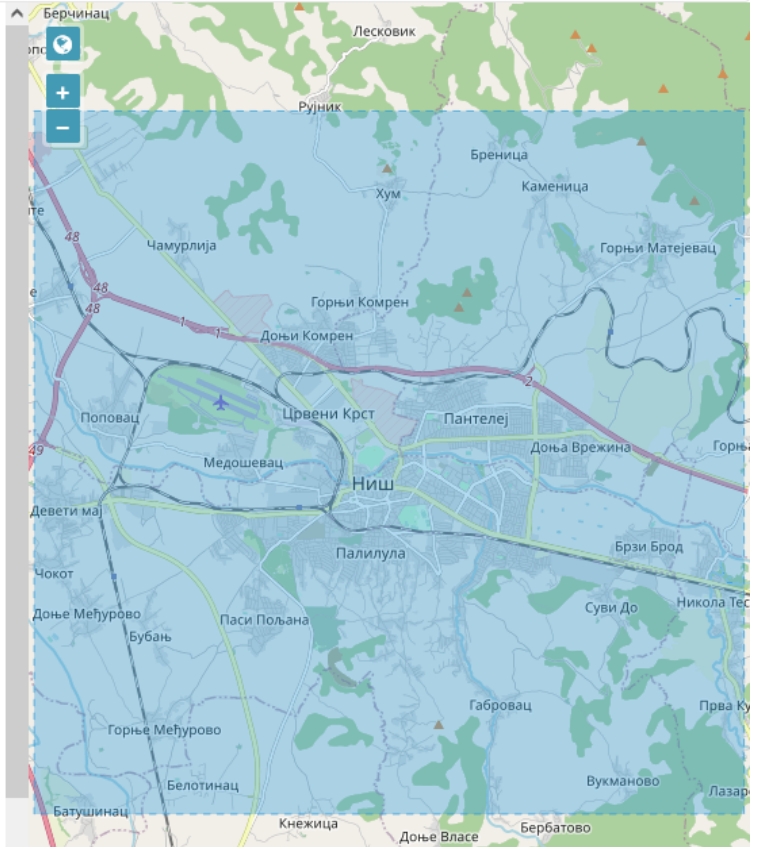
Tuesday, January 3rd 2023, 3:21 pm

Status:COMPLETED

ID:901c27bb-fa0b-4d78-858c-c3fadc3a4cda

Finished:Tuesday, January 3rd 2023, 3:21 pm

Duration:a few seconds



13

# IZABRANI PODACI



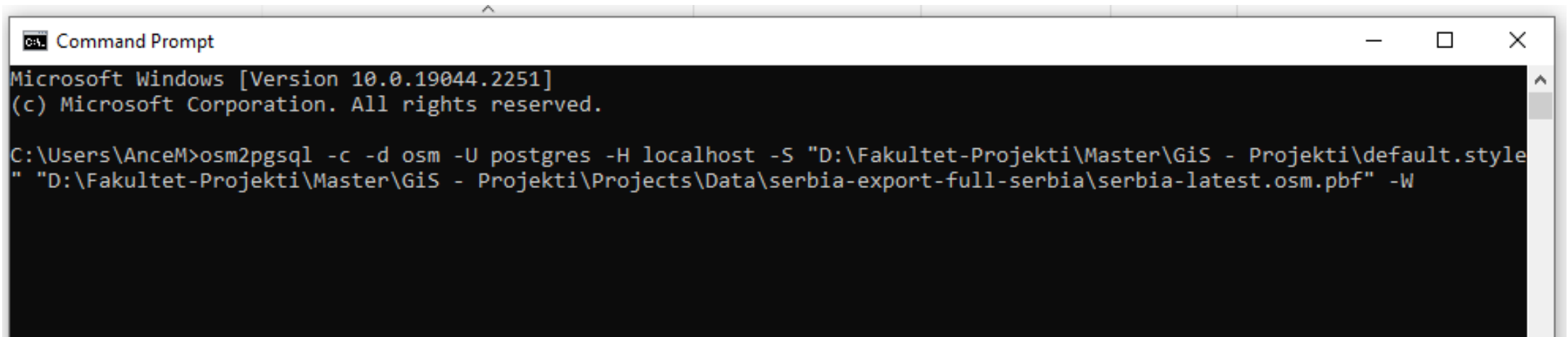
## Feature Selection



```
planet_osm_polygon:
  types:
    - polygons
  select:
    - amenity
    - beds
    - blockage
    - building
    - capacity
    - covered
    - depth
    - diameter
    - 'isced:level'
    - landuse
    - layer
    - man_made
    - name
    - natural
    - opening_hours
    - pump
    - rooms
    - shop
    - tourism
    - tunnel
    - water
    - waterway
    - width
  where:
    - boundary='administrative'
    - 'shop IS NOT NULL OR tourism IS NOT NULL OR amenity IN (''marketplace'', ''
    - 'amenity IN (''kindergarten'', ''school'', ''college'', ''university'', ''
    - 'waterway IS NOT NULL OR water=''reservoir'' OR natural=''water'' OR land
```

# IMPORTOVANJE .OSM.PBF PODATAKA

CLI komanda za importovanje podataka sa osm2pgsql

A screenshot of a Windows Command Prompt window. The title bar reads "Command Prompt". The window content shows the following text: "Microsoft Windows [Version 10.0.19044.2251] (c) Microsoft Corporation. All rights reserved. C:\Users\AnceM>osm2pgsql -c -d osm -U postgres -H localhost -S "D:\Fakultet-Projekti\Master\GiS - Projekti\default.style" "D:\Fakultet-Projekti\Master\GiS - Projekti\Projects\Data\serbia-export-full-serbia\serbia-latest.osm.pbf" -W". The command is used to import OSM PBF data into a PostgreSQL database using osm2pgsql.

```
Microsoft Windows [Version 10.0.19044.2251]
(c) Microsoft Corporation. All rights reserved.

C:\Users\AnceM>osm2pgsql -c -d osm -U postgres -H localhost -S "D:\Fakultet-Projekti\Master\GiS - Projekti\default.style" "D:\Fakultet-Projekti\Master\GiS - Projekti\Projects\Data\serbia-export-full-serbia\serbia-latest.osm.pbf" -W
```

Pre pokretanja, neophodno je kreirati default.style fajl



# DEFAULT.STYLE

```
1 # This is the default osm2pgsql .style file that comes with osm2pgsql.
2 #
3 # A .style file has 4 columns that define how OSM objects end up in tables in
4 # the database and what columns are created. It interacts with the command-line
5 # hstore options.
6 #
7 # Columns
8 # =====
9 #
10 # OsmType: This is either "node", "way" or "node,way" and indicates if this tag
11 # applies to nodes, ways, or both.
12 #
13 # Tag: The tag
14 #
15 # DataType: The type of the column to be created. Normally "text"
16 #
17 # Flags: Flags that indicate what table the OSM object is moved into.
18 #
19 # There are 5 possible flags. These flags are used both to indicate if a column
20 # should be created, and if ways with the tag are assumed to be areas. The area
21 # assumptions can be overridden with an area=yes/no tag
22 #
23 # polygon - Create a column for this tag, and objects the tag with are areas
24 #
25 # linear - Create a column for this tag
26 #
27 # phstore - Don't create a column for this tag, but objects with the tag are areas
28 #
29 # delete - Drop this tag completely and don't create a column for it. This also
30 # prevents the tag from being added to hstore columns
31 #
32 # nocache - Deprecated and does nothing
33 #
34 # If an object has a tag that indicates it is an area or has area=yes/1,
35 # osm2pgsql will try to turn it into an area. If it succeeds, it places it in
36 # the polygon table. If it fails (e.g. not a closed way) it places it in the
37 # line table.
38 #
39 # Nodes are never placed into the polygon or line table and are always placed in
40 # the point table.
41 #
42 # Hstore
43 # =====
44 #
45 # The options --hstore, --hstore-match-only, and --hstore-all interact with
46 # the .style file.
47 #
```



# DEFAULT.STYLE NASTAVAK

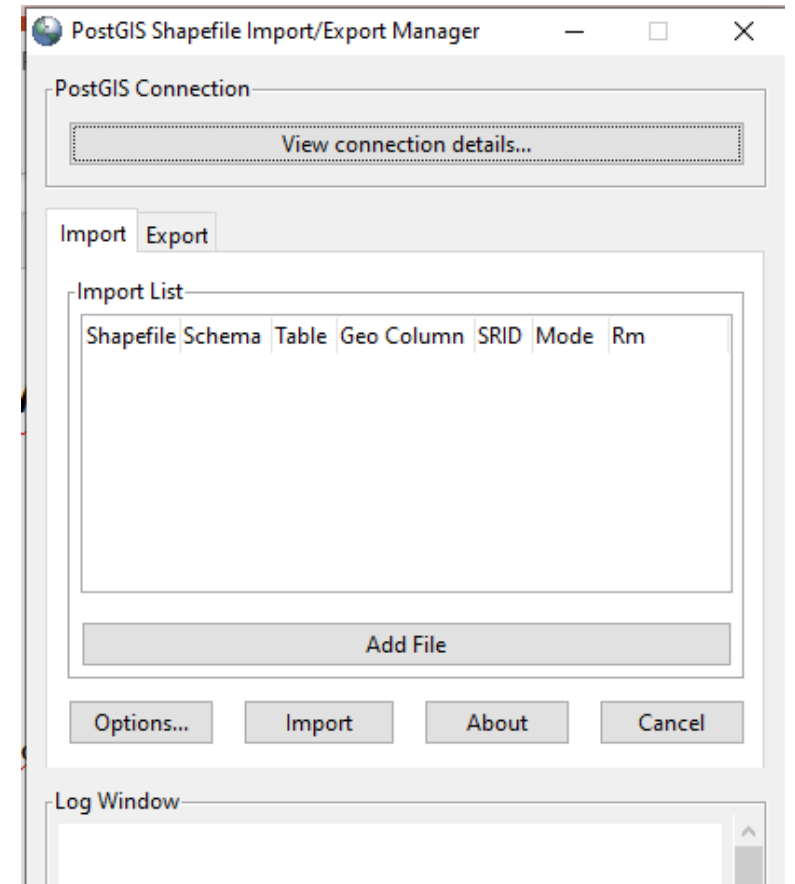
```
61 # There are some special database columns that if present in the .style file
62 # will be populated by osm2pgsql.
63 #
64 # These are
65 #
66 # z_order - datatype int4
67 #
68 # way_area - datatype real. The area of the way, in the units of the projection
69 # (e.g. square mercator meters). Only applies to areas
70 #
71 # osm_user, osm_uid, osm_version, osm_timestamp - datatype text. Used with the
72 # --extra-attributes option to include metadata in the database. If importing
73 # with both --hstore and --extra-attributes the meta-data will end up in the
74 # tags hstore column regardless of the style file.
75
76 # OsmType Tag      DataType  Flags
77 node,way access      text      linear
78 node,way addr:housename text      linear
79 node,way addr:housenumber text      linear
80 node,way addr:interpolation text      linear
81 node,way admin_level text      linear
82 node,way aerialway   text      linear
83 node,way aeroway     text      polygon
84 node,way amenity     text      polygon
85 node,way area        text      # hard coded support for area=1/yes => polygon
86 node,way barrier     text      linear
87 node,way bicycle     text
88 node,way brand       text      linear
89 node,way bridge      text      linear
90 node,way boundary    text      linear
91 node,way building    text      polygon
92 node capital        text      linear
93 node,way construction text      linear
94 node,way covered     text      linear
95 node,way culvert     text      linear
96 node,way cutting     text      linear
97 node,way denomination text      linear
98 node,way disused     text      linear
99 node ele            text      linear
100 node,way embankment  text      linear
101 node,way foot        text      linear
102 node,way generator:source text      linear
103 node,way harbour     text      polygon
104 node,way highway     text      linear
105 node,way historic    text      polygon
106 node,way horse       text      linear
107 node,way intermittent text      linear
108 node,way junction    text      linear
```

# IMPORTOVANJE .SHP FAJLOVA

Za importovanje .shp fajlova upotrebljen je shp2pgsql-gui

 shp2pgsql-gui 2.12.2022. 19:38 Application 3.065 KB

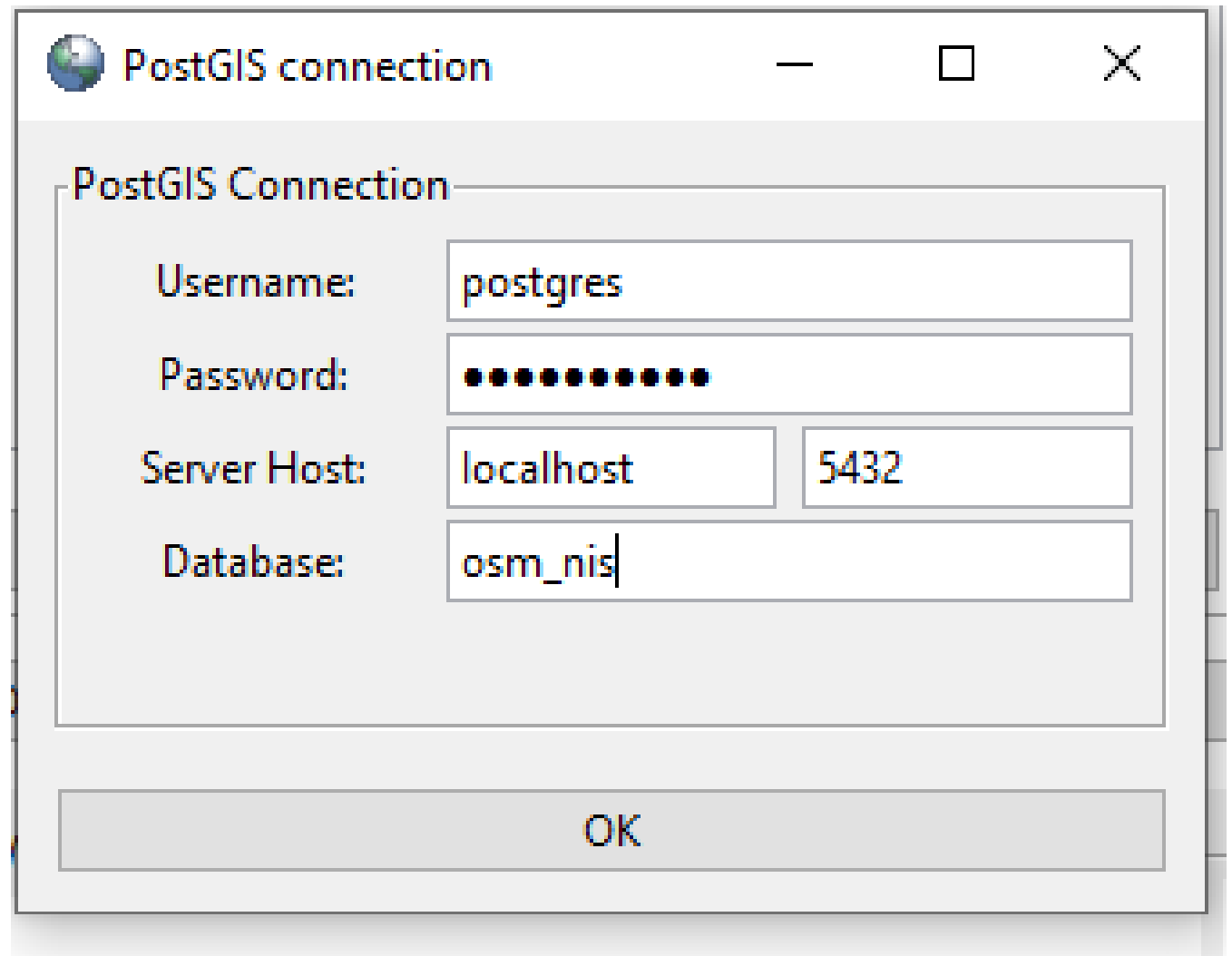
Nalazi se na lokaciji PostgreSQL instalacije, u folderu bin/postgisgui



# UNETI PODATKE O KONEKCIJI

## Log Window

Connecting: host=localhost port=5432 user=postgres  
password='\*\*\*\*\*' dbname=osm\_nis client\_encoding=UTF8  
Connection succeeded.



A screenshot of a 'PostGIS connection' dialog box. The window has a title bar with a globe icon, the text 'PostGIS connection', and standard minimize, maximize, and close buttons. The main area is titled 'PostGIS Connection' and contains four input fields: 'Username:' with the value 'postgres', 'Password:' with masked characters, 'Server Host:' with 'localhost' and a port field with '5432', and 'Database:' with 'osm\_nis'. At the bottom is a large 'OK' button.

PostGIS connection

PostGIS Connection

Username: postgres

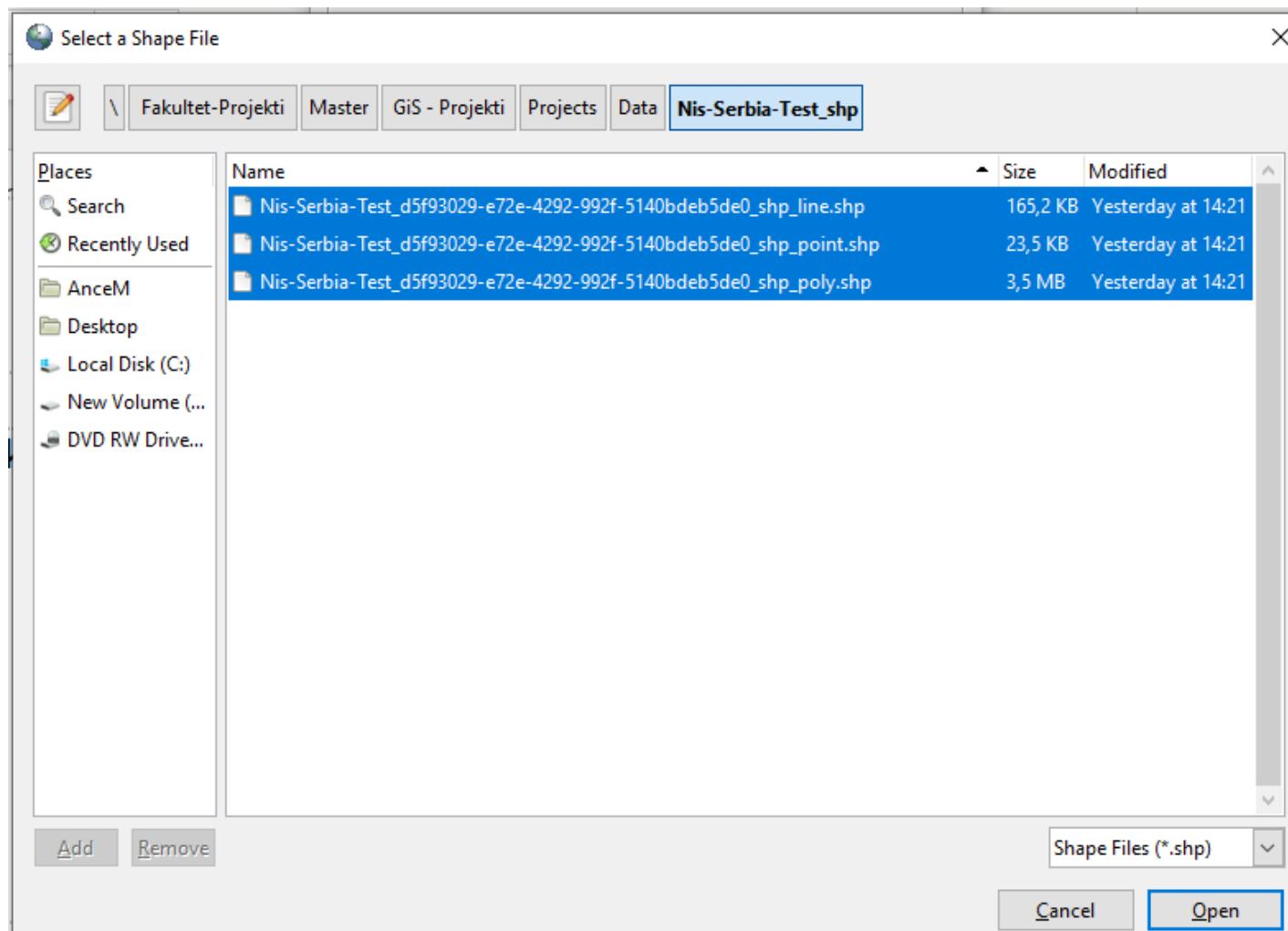
Password: ●●●●●●●●

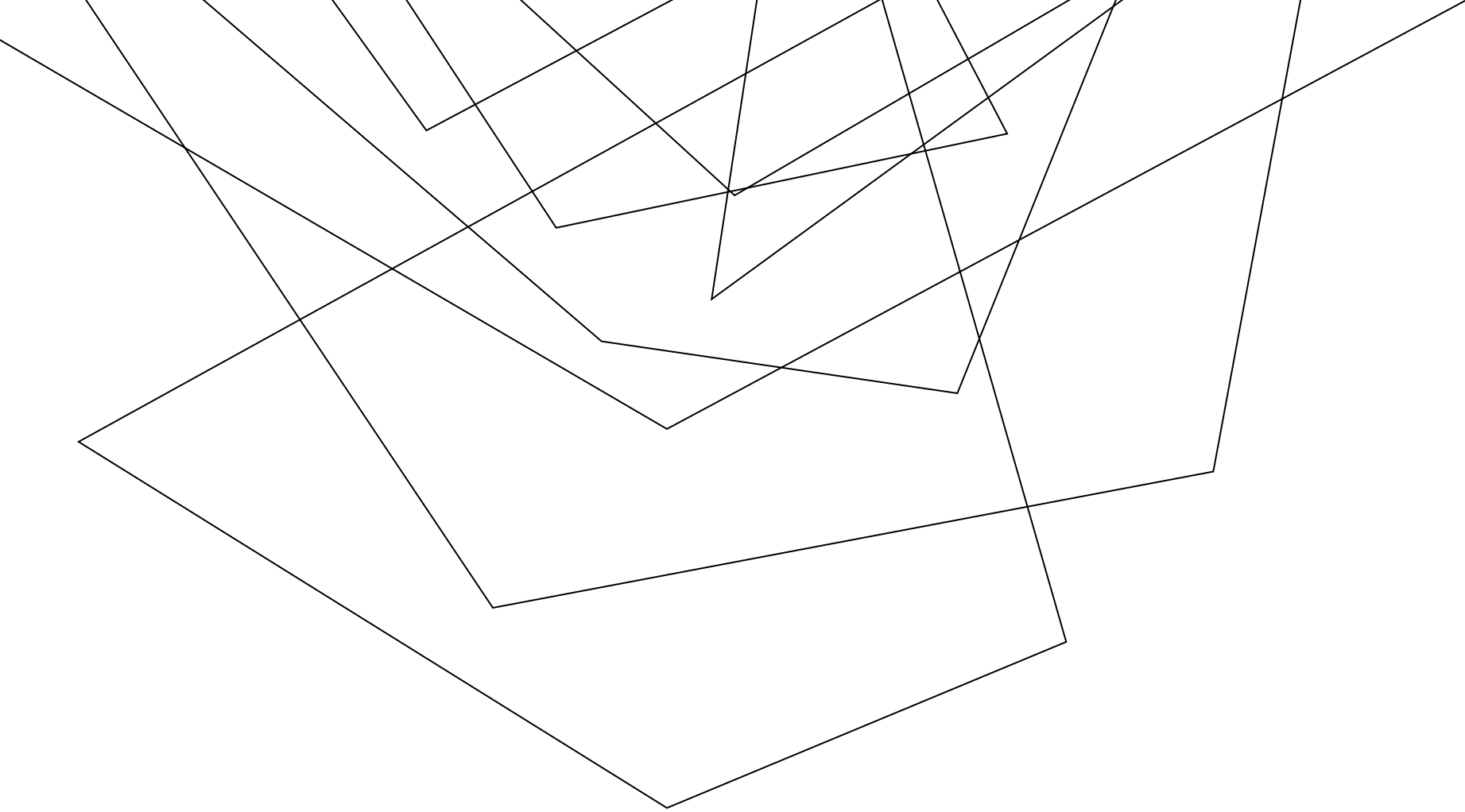
Server Host: localhost 5432

Database: osm\_nis

OK

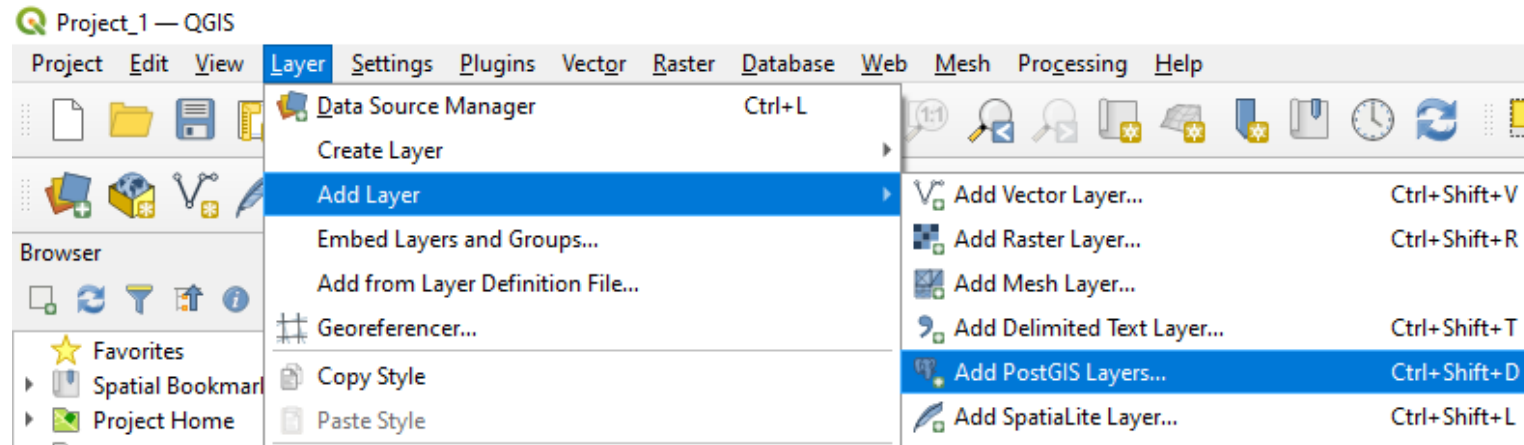
SELEKTOVATI  
ŽELJENE  
FAJLOVE I  
POKRENUTI





QGIS

# QGIS



Ubaciti PostGIS slojeve u QGIS

# QGIS

**Edit PostGIS Connection**

**Connection Information**

Name: osm\_nis\_connection

Service:

Host:

Port: 5432

Database: osm\_nis

SSL mode: disable

Session ROLE:

**Authentication**

Configurations Basic

User name: postgres ☒ Store

Password: ..... ☒ Store

Warning: credentials stored as plain text in project file.

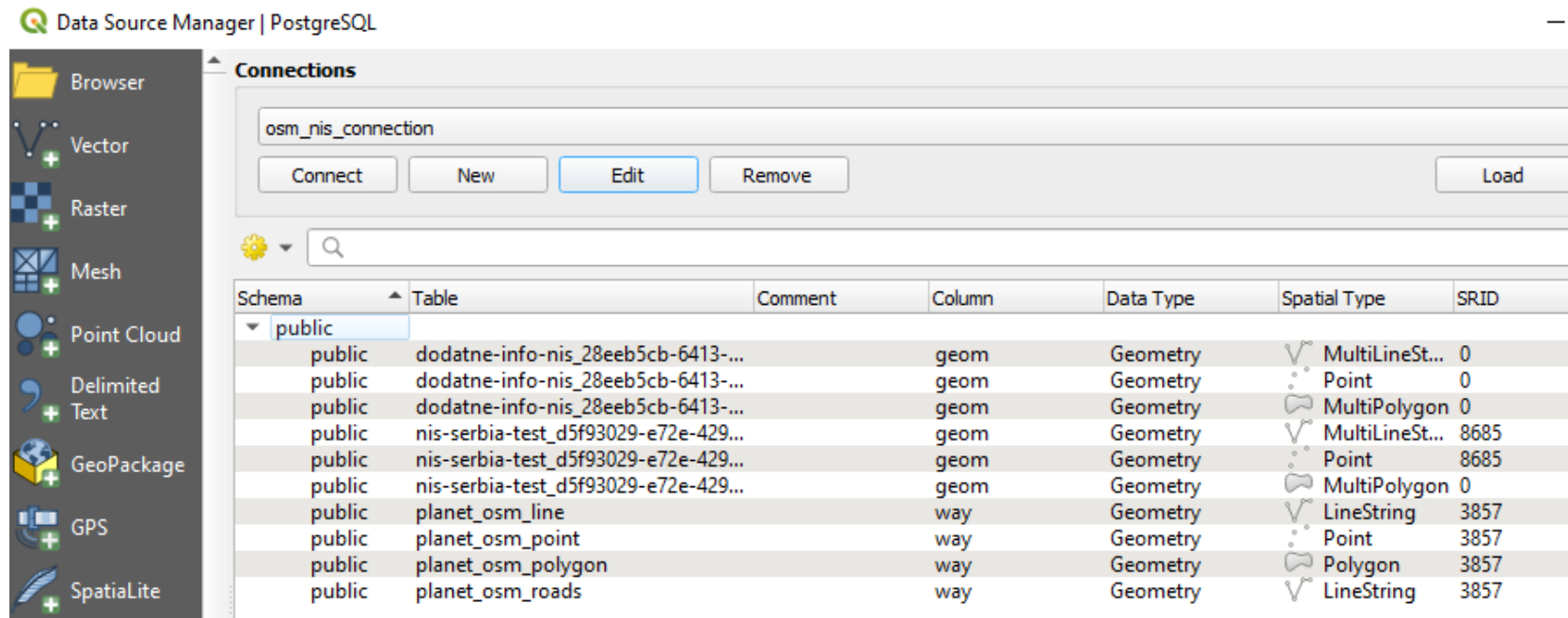
Convert to configuration

Test Connection

- Uneti podatke o konekciji i testirati konekciju
- Sačuvati podešavanja

# QGIS








Povezati se na bazu i izabrati željene podatke za importovanje

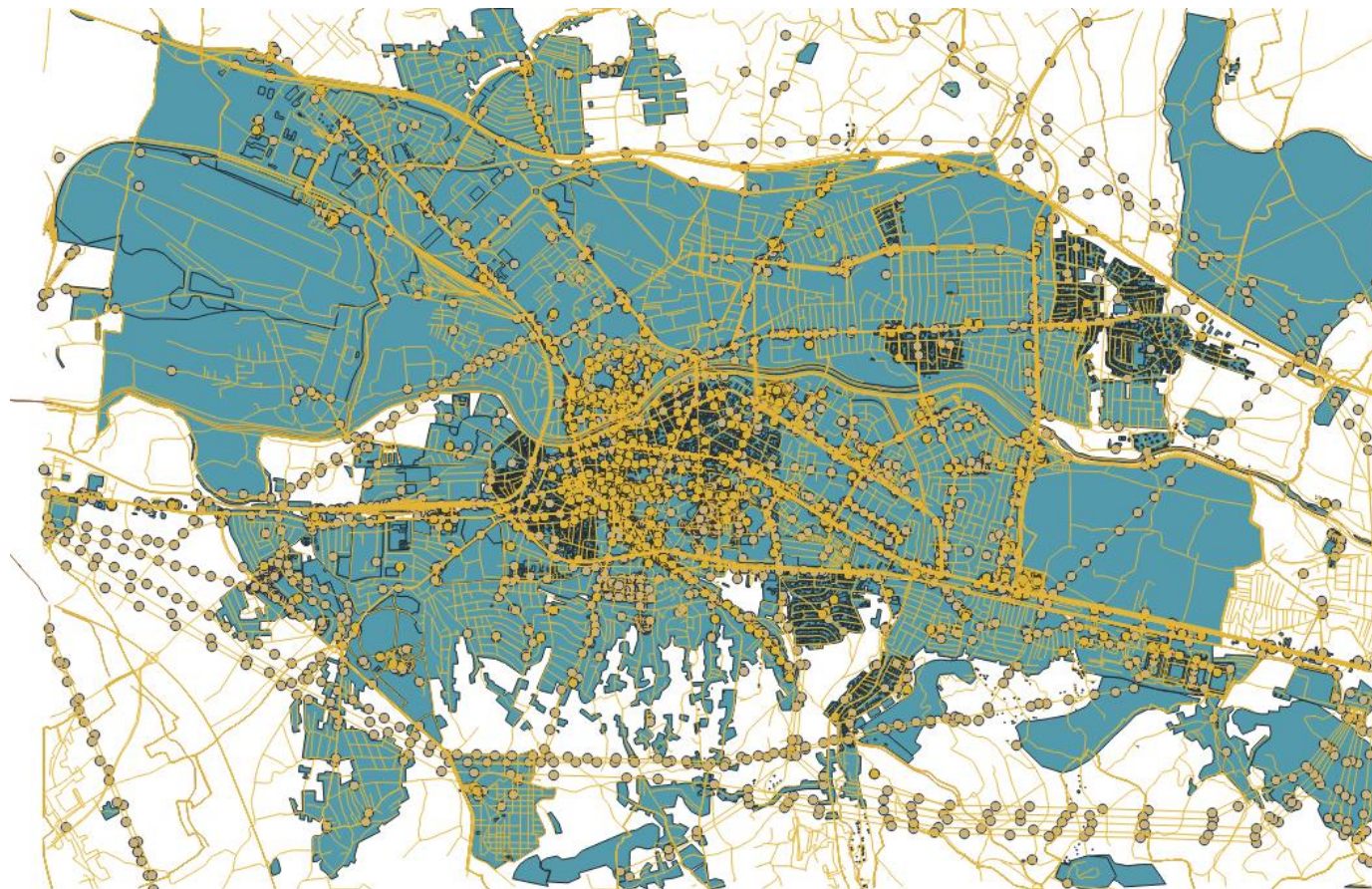


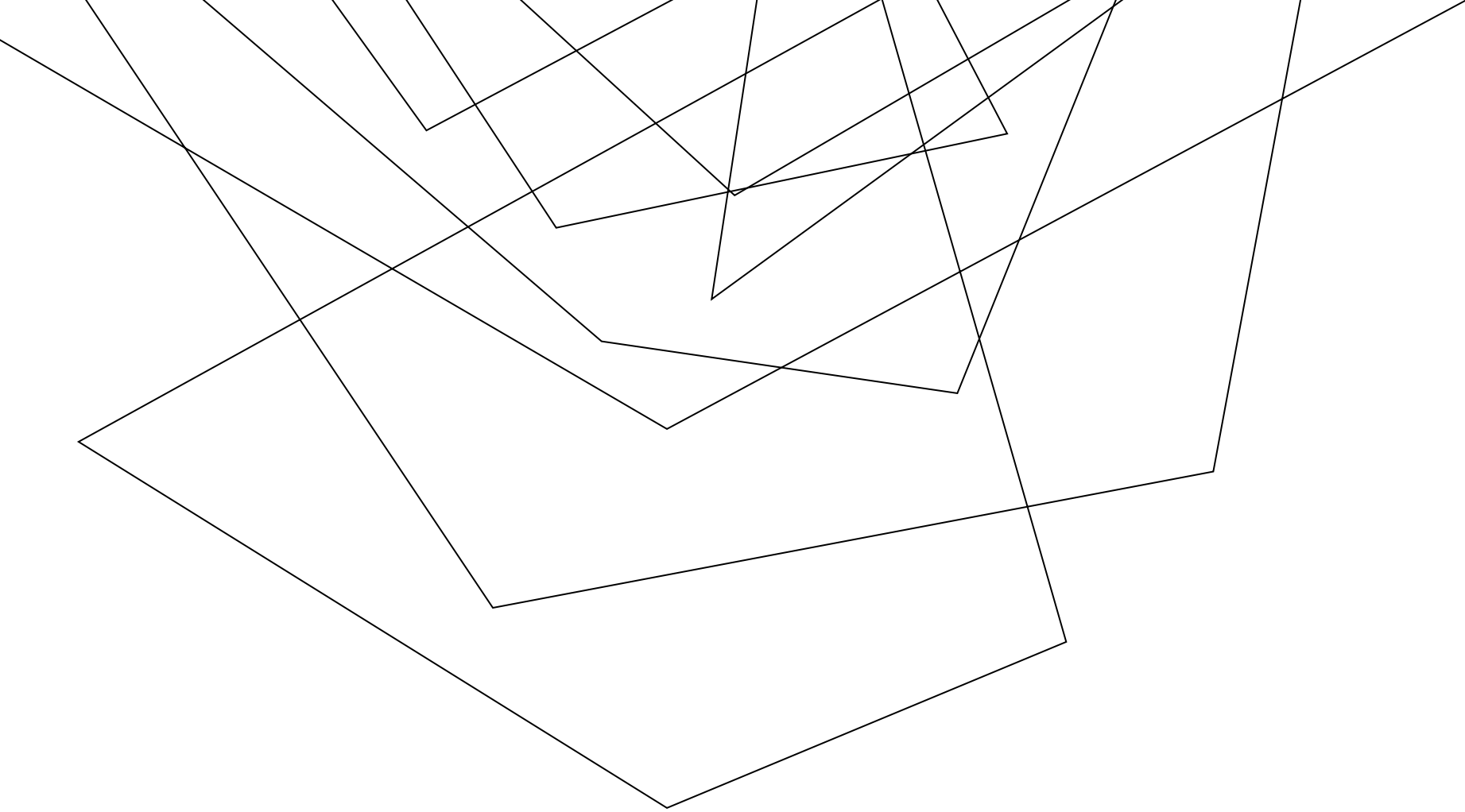


# QGIS

Prikazani su svi dodati slojevi

- ✓  dodatne-info-nis\_28eeb5cb-6413-49a2-9803-43355071454b\_shp\_line
- ✓  dodatne-info-nis\_28eeb5cb-6413-49a2-9803-43355071454b\_shp\_point
- ✓  dodatne-info-nis\_28eeb5cb-6413-49a2-9803-43355071454b\_shp\_poly
- ✓  planet\_osm\_line
- ✓  nis-serbia-test\_d5f93029-e72e-4292-992f-5140bdeb5de0\_shp\_line
- ✓  nis-serbia-test\_d5f93029-e72e-4292-992f-5140bdeb5de0\_shp\_poly
- ✓  nis-serbia-test\_d5f93029-e72e-4292-992f-5140bdeb5de0\_shp\_point
- ✓  planet\_osm\_point
- ✓  planet\_osm\_polygon
- ✓  planet\_osm\_roads





UPITI

# POINT/LINE UPIT

Primer point/line spatial upita bez indeksa

Query Query History

```
1 SELECT * FROM nis_shp_line AS line, nis_shp_point as point
2 WHERE _ST_Contains(line.geom, point.geom) AND line.waterway IS NOT NULL
```

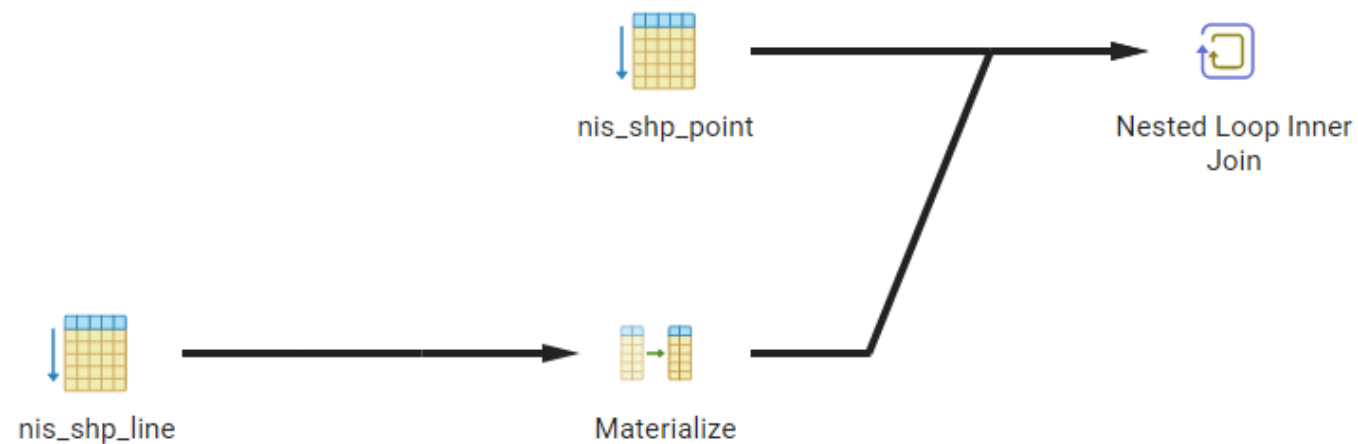
	gid integer	osm_id double precision	building character varying (80)	width character varying (80)	amenity character varying (80)	blockage character varying (80)	landuse character varying (80)	waterway character varying (80)
1	93	416526361	[null]	[null]	[null]	[null]	[null]	stream
2	39	664255899	[null]	[null]	[null]	[null]	[null]	stream

# POINT/LINE UPIT

Primer point/line spatial upita bez indeksa

Go to Settings to activate Windows.  
✓ Successfully run. Total query runtime: 1 secs 126 msec. 2 rows affected. ✕

Graphical Analysis Statistics



# POINT/LINE UPIT

Primer point/line spatial sa indeksom

Query Query History

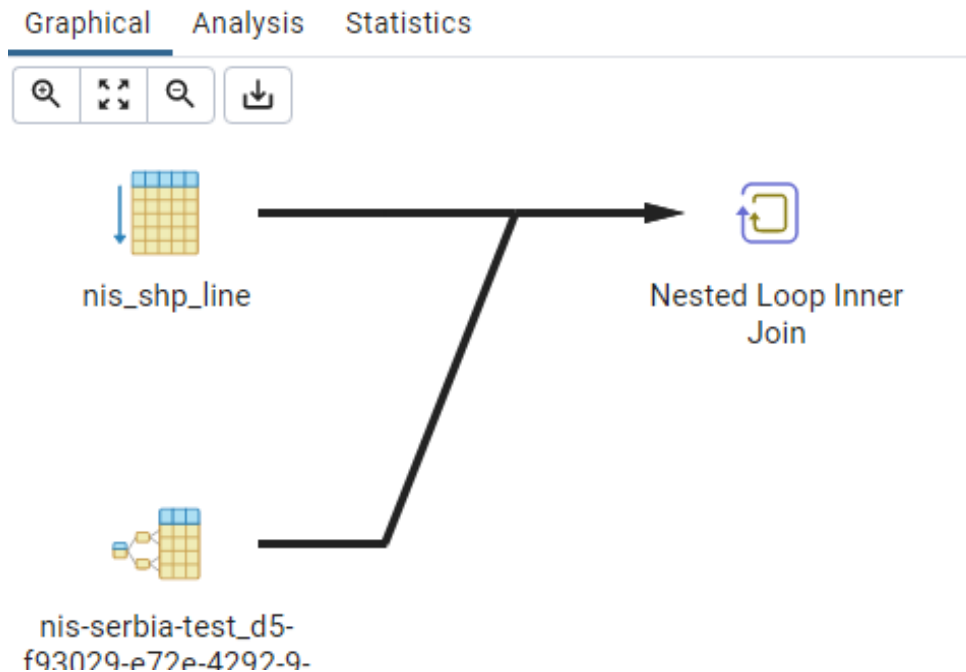
```
1 SELECT * FROM nis_shp_line AS line, nis_shp_point as point
2 WHERE ST_Contains(line.geom, point.geom) AND line.waterway IS NOT NULL
```

	gid integer	osm_id double precision	building character varying (80)	width character varying (80)	amenity character varying (80)	blockage character varying (80)	landuse character varying (80)	waterway character varying (80)
1	39	664255899	[null]	[null]	[null]	[null]	[null]	stream
2	93	416526361	[null]	[null]	[null]	[null]	[null]	stream

# POINT/LINE UPIT

Primer point/line spatial upita sa indeksom

✓ Successfully run. Total query runtime: 126 msec. 1 rows affected. ✕



# POINT/POLY UPIT

Primer point/poly spatial upita bez indeksa

Query Query History

```
1 SELECT poly.gid, poly.amenity
2 FROM nis_shp_poly_2 as poly, nis_shp_point as point
3 WHERE _ST_Contains(poly.geom, point.geom) AND poly.amenity LIKE '%school%'
```

	gid [PK] integer	amenity character varying (80)
1	130	school
2	156	school
3	156	school
4	156	school
5	151	school
6	142	school

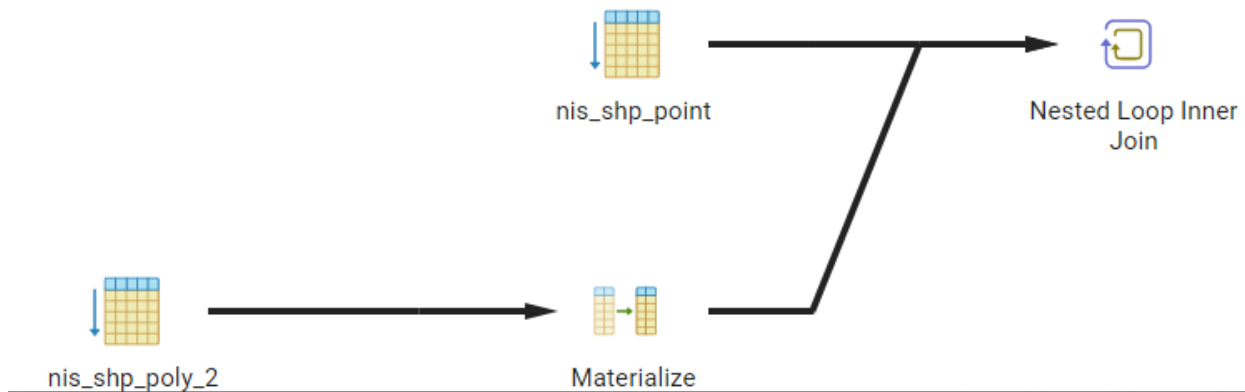
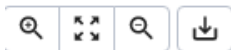
# POINT/POLY UPIT

Primer point/poly spatial upita bez indeksa

✓ Successfully run. Total query runtime: 231 msec. 1 rows affected. ✕

Ln 2, Col 75

Graphical Analysis Statistics





# POINT/POLY UPIT

Primer point/poly spatial sa indeksom

Query Query History

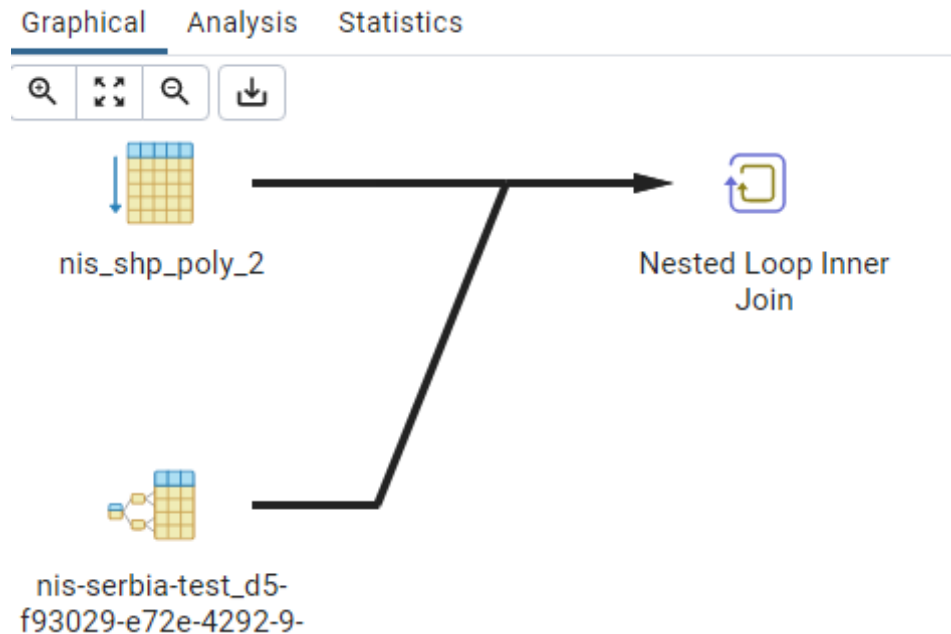
```
1 SELECT poly.gid, poly.amenity
2 FROM nis_shp_poly_2 as poly, nis_shp_point as point
3 WHERE ST_Contains(poly.geom, point.geom) AND poly.amenity LIKE '%school%'
```

	gid [PK] integer	amenity character varying (80)
1	130	school
2	142	school
3	151	school
4	156	school
5	156	school
6	156	school

# POINT/POLY UPIT

Primer point/poly spatial upita sa indeksom

✓ Successfully run. Total query runtime: 60 msec. 6 rows affected. ✕



A series of white, thin, overlapping geometric lines on a black background, forming a complex, abstract shape on the left side of the slide.

HVALA