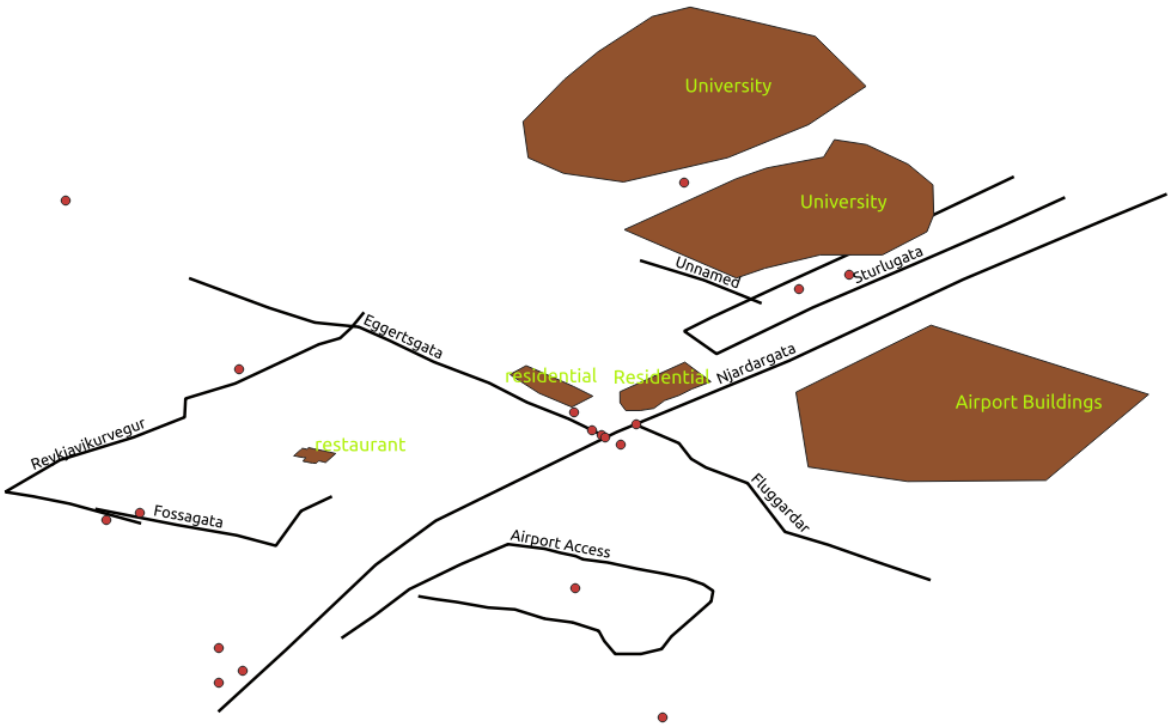
CS621 Week 9 – Self Assessment

Using Operators and writing SELF JOINS in PostgreSQL PostGIS

You have been three SQL files taking some data from OSM in the capital city of Iceland, Reykjavík. The three SQL files provide the DDL instructions for three tables: **iceland_buildings** (a collection of buildings), **iceland_roads** (a collection of linestrings representing streets in Reykjavík) and finally a point dataset called **iceland_lamposts** which gives the location of several lampost features in the city.

All of these Shapefiles are provided in EPSG:4326. A screenshot is shown of all of the three datasets in QGIS. However, for this exercise QGIS is not mandatory. Some of the questions will have answers that can be guessed by visual inspection in QGIS. However, SQL is required.

You are advised to use **EPSG:3035** for any meter-based projection calculations you are required to perform.



You should look at each of the three tables and consider the following – the column name for the geometry column, the name column (if any) and the ID field (or the primary key field).

To re-iterate – IT IS NOT NECESARY TO VISUALISE THS DATA IN QGIS.

Please note: the lampid column in the lampost dataset is a VARCHAR field.

-- Question 1
Which object has the most points in it's geometry? This may require two queries to generate the answer.

-- QUESTION 2
What is the ID of the object in the buildings dataset which is the FURTHEST DISTANCE in meters from any road? You must specify the ID of the object, rather than the distance. You must use **EPSG:3035** in any ST_Transform function.

-- QUESTION 3
Using a self-join what are the **lampid** values for the two lamposts which are FARTHEST away from each other in distance measured in meters.

-- QUESTION 4
The same query as Question 3 except you can only consider lamposts where the **lampid** field or column contains only digits.

-- QUESTION 5
Which road and single lampost are closest to each other in distance measured in meters. You should provide the **lampid** of the lampost and the name of the road. As practice for your written exam, think about how the choice of CRS and the accuracy of the coordinates of these points and lines could affect the results of this calculation.

-- QUESTION 6
Write a Self Join query to find out how unique many pairs of roads DO NOT intersect each other.

-- QUESTION 6A
Same question as Q6 but you should only consider roads where the name starts with a vowel.

-- QUESTION 7
What are the names of the two roads which are closest to each other but do not intersect each other.

-- QUESTION 8
What are the IDs of the buildings (if any) who have bounding rectangles or boxes which intersect each other? HINT - you'll need the && operator and you'll need to use the ID field to help remove duplicates.

-- QUESTION 9
What are the IDs of the buildings which are closest to each other, as measured in meters.