Creating and Loading a Spatial Database

1. Install psql and postGIS

- **Mac**

Postgres.app

- **Linux**

- PostgreSQL
- PostGIS

2. **Create a database and connect to it**

```
~> createdb --owner lucia --password nyc
[ createdb -O lucia -W nyc ]


~> psql --dbname=nyc
[ Or \c nyc from psql prompt ]
[ \l to list all ]
```

3. **Enable spatial support**

```
=# CREATE EXTENSION postgis;

=# SELECT postgis_full_version();
```

4. Create sql load commands from shapefiles

```
~> mkdir sqlloads


~> shp2pgsql -I -s 26918 data/nyc_census_blocks.shp nyc_census_blocks
> sqlloads/nyc_census_blocks.sql


~> shp2pgsql -I -s 26918 data/nyc_neighborhoods.shp nyc_neighborhoods
> sqlloads/nyc_neighborhoods.sql


~> shp2pgsql -I -s 26918 data/nyc_streets.shp nyc_streets >
sqlloads/nyc_streets.sql


~> shp2pgsql -I -s 26918 data/nyc_subway_stations.shp
nyc_subway_stations > sqlloads/nyc_subway_stations.sql
```

Wait, what?

A **shapefile** is a vector data storage format for storing the location, shape, and attributes of geographic features.

It’s actually a collection of files:

- .shp → shape (geometry)
- .shx → index
- .dbf → attributes
- [.prj] → projection

Wait, what? (2)

SRID [Spatial Reference System Identifier] is a unique value that unambiguously specifies the projection and coordinates used to arrive to the given geometries

Two geometries with different SRIDs cannot be compared

SRID 26918 is a projection optimized for North America -78°W to 72°W, which in particular includes NYC. [http://spatialreference.org/ref/epsg/nad83-utm-zone-18n/]

SRID 4326 corresponds to the World Geodetic System → standard coordinate system for the Earth (in lat/lon) with a standard spheroidal reference surface and origin at the Earth's center of mass. The error is believed to be less than 2cm

5. **Load spatial data into db**

```
~> psql -U lucia -d nyc -f sqlloads/nyc_census_blocks.sql

~> psql -U lucia -d nyc -f sqlloads/nyc_neighborhoods.sql

~> psql -U lucia -d nyc -f sqlloads/nyc_streets.sql

~> psql -U lucia -d nyc -f sqlloads/nyc_subway_stations.sql

~> psql -U lucia -d nyc -f data/nyc_census_sociodata.sql
```