The importance of urban green spaces in terms of environmental benefits and public health is well documented. In Berlin, urban planning initiatives aim to ensure equitable access to these important resources. The goal of this project is to analyze the distribution of urban green spaces.

Use the terminal to navigated to the project directory on the local machine (cd "/Users/binghui/Desktop/2024 SP/IDCE376 DATABASE/UrbanGreenSpacesProject")

Imported the OSM data into a PostgreSQL database using the osm2pgsql tool.( osm2pgsql -H localhost -P 5433 -d urban\_green\_spaces -U postgres -W “/Users/binghui/Desktop/2024 SP/IDCE376 DATABASE/UrbanGreenSpacesProject/berlin.osm.pbf”)

Created a new table green\_spaces to store the green space data extracted from the OpenStreetMap dataset. The structure of the table includes an ID, name, geographic location, and area in square meters:

CREATE TABLE green\_spaces (

id SERIAL PRIMARY KEY,

name VARCHAR(255),

location GEOMETRY(Point, 4326),

area\_sq\_m NUMERIC

);

After setting up the table, we populate the data by selecting relevant fields from the Planet\_osm\_polygon table.

INSERT INTO green\_spaces (name, location, area\_sq\_m)

SELECT name, ST\_Transform(ST\_Centroid(way), 4326) as locn, ST\_Area(way)

FROM planet\_osm\_polygon

WHERE leisure = 'park';

To get an initial idea of the distribution of green space within the city, we performed several aggregate functions to calculate

SELECT COUNT(\*) AS total\_parks FROM green\_spaces;

SELECT SUM(area\_sq\_m) AS total\_area FROM green\_spaces;

SELECT AVG(area\_sq\_m) AS average\_area FROM green\_spaces;

SELECT SUM(ST\_Area(way)) as total\_green\_space\_area

FROM planet\_osm\_polygon

WHERE leisure = 'park';

Finally, we got the result. From SQL Query Example 1, the total area of green spaces in the city is approximately 11.5 square kilometers." From SQL Query Example 2, the query lists the top 5 largest green spaces by name and area,

Volkspark Rehberge 1.76 sq km

Schlosspark Charlottenburg 1.25 sq km

Volkspark Humboldthain 0.68 sq km

Park am Plötzensee 0.51 sq km

Schillerpark 0.39 sq km

图表, 散点图

描述已自动生成

(Figure 1. QGIS visualization)

Distribution of Green Spaces with Top 5 Largest Parks Highlighted. The top five largest parks, as identified by our analysis, are represented by graduated symbols and are labeled with their names.