

Instructions

**“And what happened then? Well, in Whoville they say
That the Grinch’s small heart grew three sizes that day!”**

Dr. Seuss - How the Grinch Stole Christmas!

Purpose:

As you probably know, the town of Whoville (made popular by Dr. Seuss books) is located on a snowflake, which is basically a flat surface (i.e. no SRID). When pressed to describe the town of Whoville, Dr. Seuss drew a diagram of the town centre which can be found as an attachment below.

Using the sketch as a guide and the `creWhovillePoints.sql` script create the necessary table structure for a Whoville database and write the queries requested below.

Submissions:

For this assignment you will submit 2 files:

1. SQL script named `creWhovilleTbls.sql` for your table structure.
2. SQL script named `whovilleQueries.sql` for your queries.

Instructions:

Part A - Database Creation:

1. Create a new database named **Whoville**.
2. Add the `postgis` extension to the Whoville database.
3. From within the Whoville database open the `creWhovillePoints.sql` file found in the attachments section of this assignment and run the script.
 - The script will create a new table called `whopoints` and populate that table with points you will need to complete Part B below. The points make up the polygons and lines of Whoville.

Part B - Script #1 Table Structure:

From within your Whoville database create a new script and name it **`creWhovilleTbls.sql`**. Write the following table structure logic in this script:

1. Create a new table named **`whoplace`** with the following fields:
 - `id` (serial Primary Key), `name` (text), `geom` (`geometry(POINT)`)

2. Create a new table named **whoroad** with the following fields:
 - id (serial Primary Key), name (text), geom (geometry(LINESTRING))
3. Create a new table named **whodistrict** with the following fields:
 - id (serial Primary Key), name (text), geom (geometry(POLYGON))
4. Using the points from the whopoints table populate your whoroad table with the correct road segments (use the town centre diagram as reference).
5. Using the points from the whopoints table populate your whodistrict table with the correct polygons (use the town centre diagram as reference).
6. Insert into the whoplace table the locations (points) in the town centre diagram. Use the grid in the diagram to derive the correct coordinates.

Use the town centre diagram as reference to ensure your geometries are correctly inserted into all three tables.

Part C – Spatial Queries

After populating the tables, create the following SQL spatial queries on the Whoville tables.

1. Calculate the area of all the Whoville districts, listing from largest to smallest areas showing one decimal place for the area column.
2. Determine the total length of all roads in Whoville that the snowplough will have to clear. Show two decimal places for the length total.
3. Determine the distance between Cindy Lou's House and the Town Christmas Tree. Note: The “Lou’s” string can be tricky to search.
4. Determine what Whoplaces are located within the Sandwich Corner district.