

Rubric Homework 3

HW 3 Grading Rubrics (5 points)

If there are any doubts more details can be found here, do reach out to other graders and professors in email so we can collaborate and decide on how to handle those weird corner cases.

And in general, let us be somewhat liberal, rather than too strict.

Late penalty (-0.5 point / 24h, ddl: 6th April, 2020 11:59 pm PST)

Files not zipped penalty (-0.5 point, note if only the spiro files are not zipped, deduct 0.25)

KML file or files (1 point)

open it in Google earth or some KML viewer. If the entire submission is one PDF, you would have to copy and save it as a KML file to view it. (Student might use multiple files)

Note: It is expected for students to learn how to use KML files. Do not deduct here for correctness.

You can deduct in SQL section for correctness.

- It should have 15 different GPS locations in 3 different categories.
- Should have convex hull mapped (even if it's incorrect, you can award points here and deduct in the SQL section)
- Should have nearest neighbors (even if it's incorrect, you can award points here and deduct in the SQL section)
- If the convex hull and nearest neighbors are split into two separate files, it's fine.
- If either the convex hull, or 4 nearest neighbors, or 1 or more of the GPS locations are missing, deduct 0.25 points each.
- If not follow 3 categories 5 points each, deduct 0.25
- If the convex hull is not clear/only a ring instead of colored region, deduct 0.25
- If there is no expand feature, deduct 0.25

Screenshots of results (0.5 points)

No partial grading here. Deduct points if it's wrong (though not sure why it would be).

SQL file (1 point for convex hull and 1 point for nearest neighbors.)

You can use Postgres, Oracle11g or MySQL (though expect many to use Postgres). Also AWS and Google cloud platforms can be used.

There is very less chance of making a mistake here, you basically call ST_CONVEXHULL (in

postgres) and your convex hull for points is generated (unless someone is adventurous to simulate ST_CONVEXHULL function on their own). Similar function call for nearest neighbor.

Note: The queries are pretty straight forward. If you are not sure if the query is right, you can run them and see. You do not need any testing data to test it, the students are expected to provide create statements or hard code GPS points.

- **-0.5** if either the points are not hardcoded in queries or no create statements available for both queries.

- Create statements expected if points are not hardcoded for convex hull or nearest neighbor

- **-1** if convex hull generated is not convex :-) (having some points outside the boundary).

(Sometimes the convex hull might have some parallax, that is accepted)

- **-0.5** If nearest neighbors are sorted incorrectly (farthest 4 points given)

- **-1** if nearest neighbors are incorrect (random points chosen, no sorting done)

In other words, the above two items means this: 4 nearest neighbors are not what get created.

SQL Sample Solution:

```
CREATE TABLE LocationPoints (  
id SERIAL PRIMARY KEY,  
name VARCHAR(64),  
location GEOMETRY(POINT,4326));  
  
INSERT INTO LocationPoints (name, location) VALUES  
(  
'ParkingLot6', ST_GeomFromText('POINT(34.021700 -118.290094)', 4326)),  
(  
'ParkingLotB', ST_GeomFromText('POINT(34.022781 -118.282703)', 4326)),  
(  
'ParkingLotM', ST_GeomFromText('POINT(34.023784 -118.285065)', 4326)),  
(  
'JeffersonBoulevardStructure', ST_GeomFromText('POINT(34.024822 -118.289422 )', 4326)),  
(  
'GrandAvenueStructure', ST_GeomFromText('POINT(34.020019 -118.277217)', 4326)),  
(  
'LeaveyLibrary', ST_GeomFromText('POINT(34.021732 -118.282790)', 4326)),  
(  
'EdwardLDohenyJrMemorialLibrary', ST_GeomFromText('POINT(34.020059 -118.283744 )', 4326)),  
(  
'HooseLibraryofPhilosophy', ST_GeomFromText('POINT(34.018705 -118.286602)', 4326)),  
(  
'GaughanandTibertiLibrary', ST_GeomFromText('POINT(34.018630 -118.282524)', 4326)),  
(  
'WilsonDentalLibrary', ST_GeomFromText('POINT(34.023970 -118.286216)', 4326)),  
(  
'USCViterbiSchoolofEngineering', ST_GeomFromText('POINT(34.020633 -118.289328)', 4326)),  
(  
'USCDepartmentofAerospaceandMechanicalEngineering', ST_GeomFromText('POINT(34.020078
```

```

-118.287499)', 4326)),
('USCSchoolofCinematicArts', ST_GeomFromText('POINT(34.023586 -118.286513)', 4326)),
('USCDornsifeCollegeofLettersArtsandSciences',ST_GeomFromText('POINT(34.021971
-118.284728)', 4326)),
('USCGouldSchoolofLaw', ST_GeomFromText('POINT(34.018678 -118.284241)', 4326));
SELECT ST_AsText(ST_ConvexHull(
ST_Collect(location))) AS polygon
FROM LocationPoints;
SELECT id, name, ST_X(location), ST_Y(location), st_distance(location,
'SRID=4326;POINT(34.020633 -118.289328)::geometry) as d
FROM LocationPoints
WHERE name != 'USCViterbiSchoolofEngineering'
ORDER BY d
LIMIT 4;

```

Html file or CodePen/jsFiddle link (1 point)

- should be able to view 15 sampled points
- **-0.25** for missing points
- **-0.5** for not using localStorage (if the points directly get plotted, with being stored and retrieved).

Spiro.zip (0.5 point)

If not zipped, deduct **0.25**

Full marks if all the 4 are present.

-0 point for wrong result.

-If result is correct but file missing, deduct **0.25** each.

- Screenshot of the shapefile data visualized using ArcGIS Online.
- KML file (pasted in PDF, is fine)
- shapefile.zip
- Code to generate spirograph curve. Starter code in JavaScript is given. You might want to run it once and check if you doubt the code (unless they have written it in a weird language that you can't compile and run). You can use <https://www.codechef.com/ide> (or other online IDEs) to run it and see if you don't have a particular compiler or interpreter.

Allowed corner cases:

- If students haven't played with the r, R and other params, it would go into the Pacific ocean (or other oceans for DEN students :D)
- If the curve in KML above the ground by some distance

