Project Document

For

System Integration

Comp851 Spring 2021

GitHub Link:

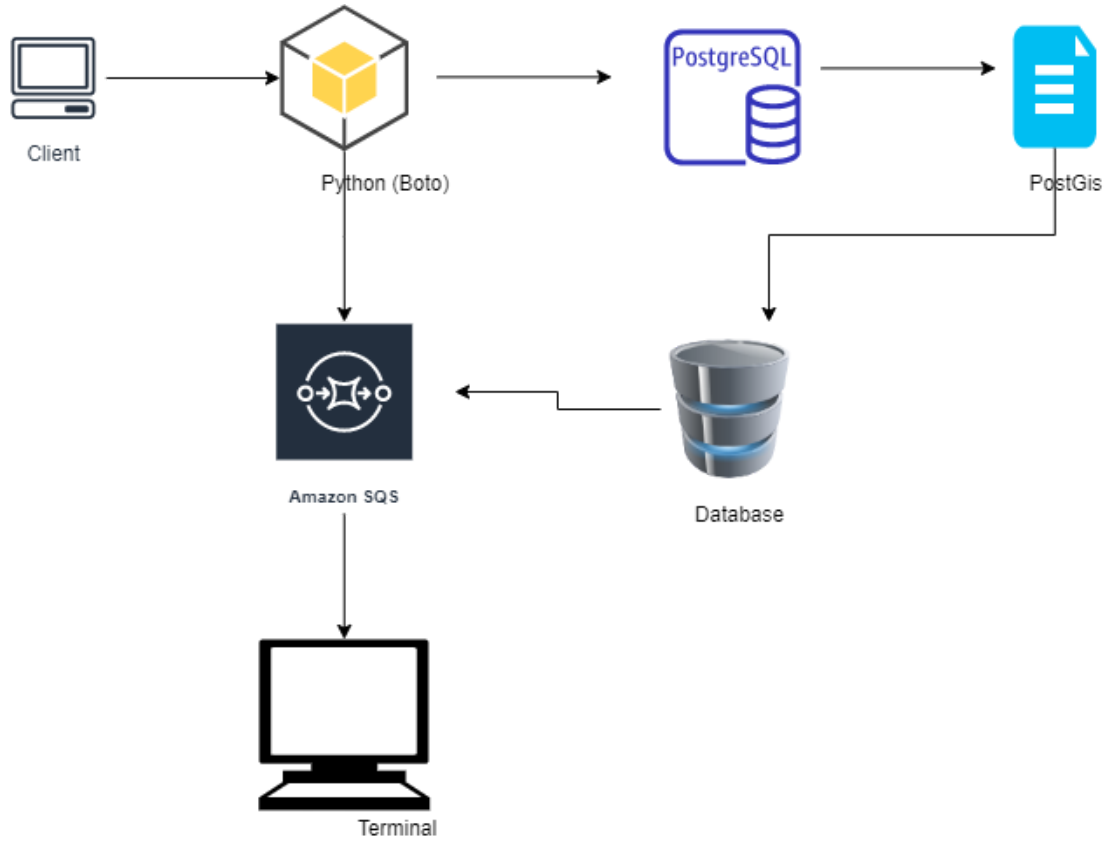
https://github.com/hb1142/Comp851_Project.git

I have chosen the second integration part for the project:

PTWC widgets expand in the field and report their GPS location. To prepare for field operations, we create a database that determines the proximity of widgets to county and township locations where field operators may or may not pass. To do this, we need to deploy a GIS database called PostGIS and get the city's latitude and longitude coordinates.

Additionally, we report and document the participation of these positions in preparation for the field manager and widget positions. We do this by using the AWS SQS and SNS / SES interfaces to send notifications and emails and finally we deposit the log entries in s3. I have used python3.

Process Flow Using the Draw.io:

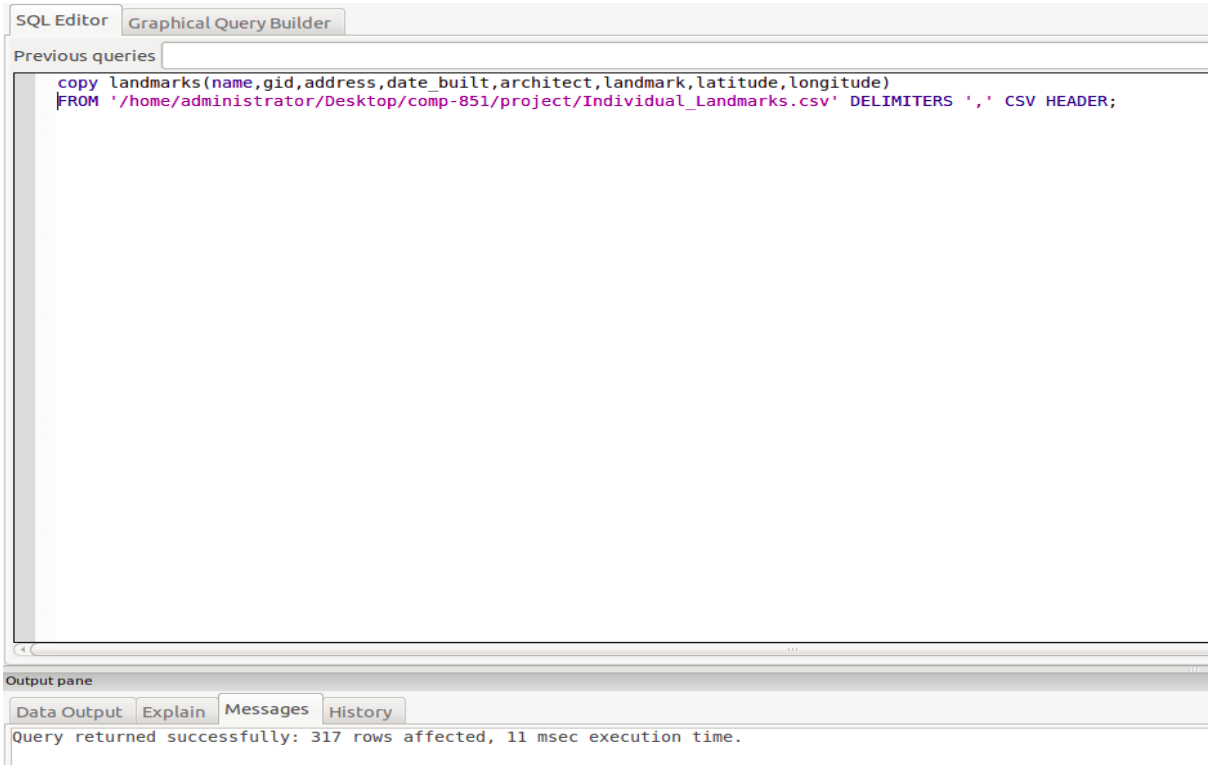


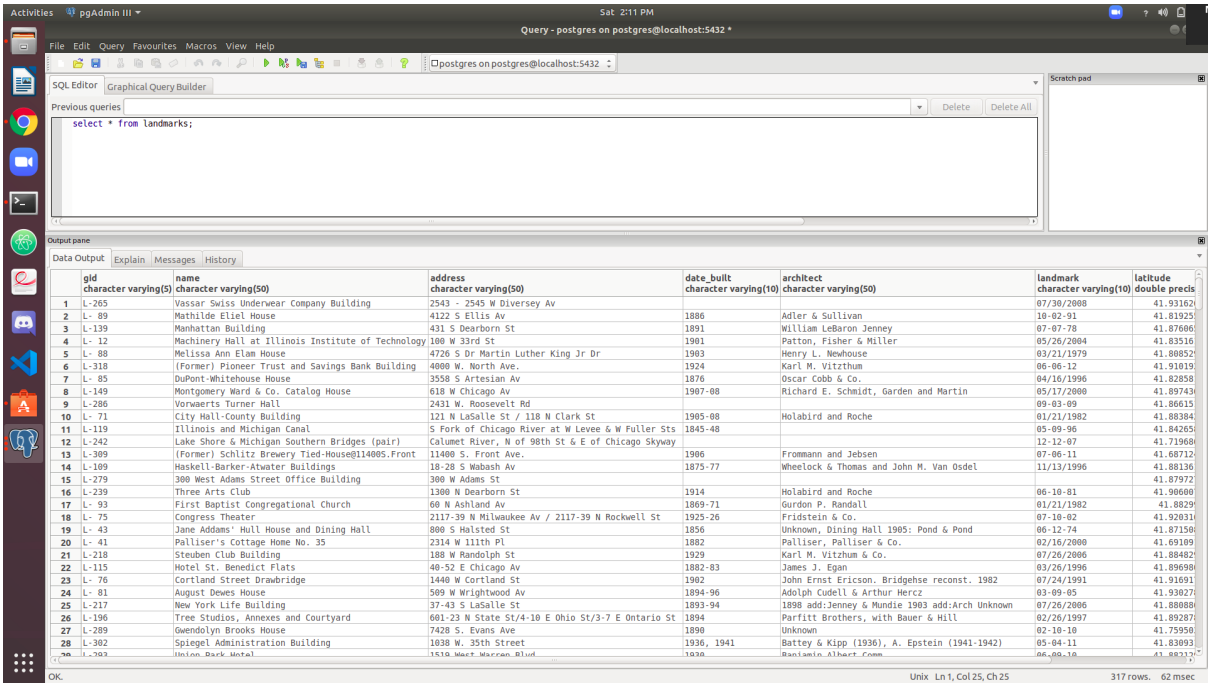
Implementation of the project using PostGres GUI:

Before implementing using python, I have decided to test the process flow using PostGres GUI and then fetching the required results.

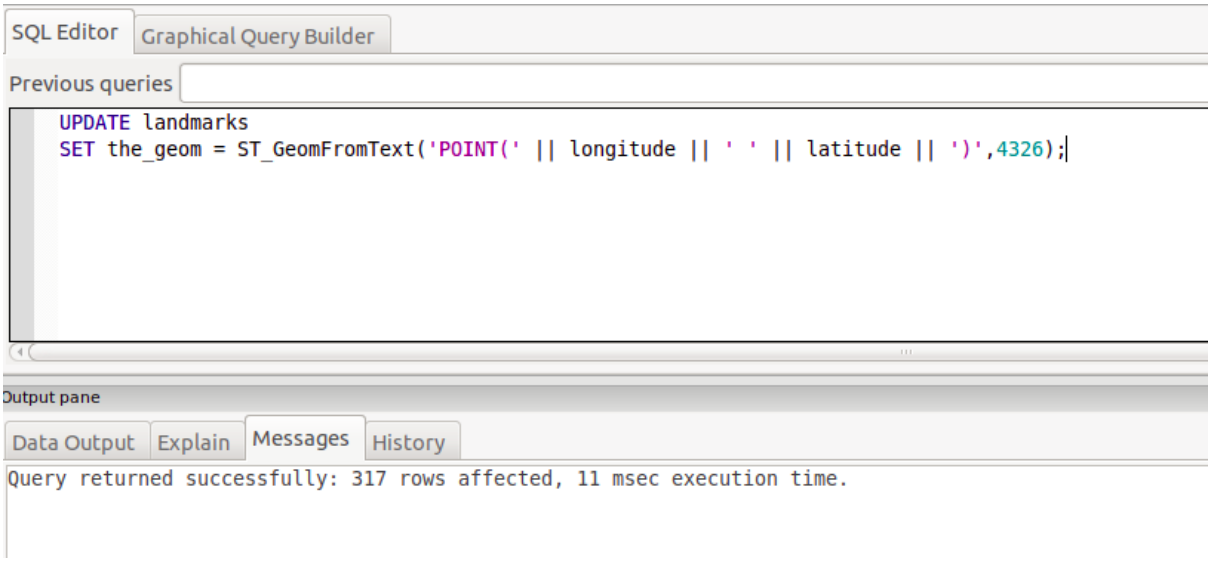
Step 1: Create Table and Index

Step 2: Import data from the CSV file





Step 3: Convert Latitude and longitude coordinates to points that are readable by Post GIS



Step 4: Write a PostGIS query to display the nearest 5 locations for the given latitude and longitude

SQL Editor | Graphical Query Builder

Previous queries

```
SELECT
ST_Distance(ST_GeomFromText('POINT(-87.6348345 41.8786207)', 4326), landmarks.the_geom) AS planar_degrees,
name,
architect
FROM landmarks
ORDER BY planar_degrees ASC
LIMIT 5;
```

Output pane

Data Output | Explain | Messages | History

	planar_degrees double precision	name character varying(50)	architect character varying(50)
1	0.0007463848779255456	Brooks Building	Holabird & Roche
2	0.0013933886958850995	300 West Adams Street Office Building	
3	0.0018793811696624153	Continental And Commercial National Bank Building	
4	0.002712009853856664	Chicago Board of Trade Building	Holabird & Root
5	0.00307102762438656	Rookery Building	Burnham & Root

Implementation of the project using Python:

I have attached python files in the zip folder in my courses.

```
(test_env) administrator@Administrator:~/Desktop/comp-851/project$ python3 project.py
5 closest landmarks to -87.6348345 41.8786207
********************
Location-1
----------
Planar_Degrees - 0.0007463848779255456
Name - Brooks Building
Architect - Holabird & Roche
Latitude - 41.87787644
Longitude - -87.63477822
********************
Location-2
----------
Planar_Degrees - 0.0013933886958850995
Name - 300 West Adams Street Office Building
Architect - None
Latitude - 41.87972743
Longitude - -87.63568107
********************
Location-3
----------
Planar_Degrees - 0.0018793811696624153
Name - Continental And Commercial National Bank Building
Architect - None
Latitude - 41.87907898
Longitude - -87.63301185
********************
Location-4
----------
Planar_Degrees - 0.002712009853856664
Name - Chicago Board of Trade Building
Architect - Holabird & Root
Latitude - 41.87773513
Longitude - -87.63227115
********************
Location-5
----------
Planar_Degrees - 0.00307102762438656
Name - Rookery Building
Architect - Burnham & Root
Latitude - 41.87907613
Longitude - -87.63179743
********************
PostgreSQL connection is closed
(test_env) administrator@Administrator:~/Desktop/comp-851/project$
```