Industrial Pattern in Ireland

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Introduction

Ireland has been very welcoming for the past three months of my stay. I love to travel and meet new people, this way I can learn more about the place and work culture. Ireland is categorized into four provinces Connacht, Leinster, Munster and Ulster. These provinces are further divided into 31 counties. For this Project, I decided to study the work pattern across Ireland for insights on the most favorable counites for different industries. Though there are numerous industries, I have categorized them into four groups as below and analyzed the leading counites in each sector: -

Type 1: - Agriculture and Forestry.
Type 2: - Building, Industrial and Manufacturing.
Type 3: - Commerce, Trade and Transport.
Type 4: - Other like Administration, Professional services, Hospitality etc.

Spatial Data Links

- *Geospatial data* and *boundary files* are downloaded from https://www.cso.ie/en/census/ and https://www.geofabrik.de/
- Color scheme for web-based choropleth map selected from http://colorbrewer2.org

Concepts Used

- Import & Visualizing Data from Excel, GeoJson and Shapefiles in QGIS & POSTGIS.
- Creating Partial Joins between the boundary file and Spatial data for analysis.
- Creating Views in POSTGIS for Visualization in QGIS.
- Using different Class Intervals, Labelling, Color scheme, Feature Selection on a map using freehand.
- Choropleth Map, Heat Map and Web Map (Point, Polygon and Choropleth) Creation.

Story of Preparation and Analysis of the Maps

- **Studying about the Counties in Ireland.**

The four provinces of Ireland are Connacht, Leinster, Munster and Ulster. These provinces are divided into 31 counties and are consistent Irish land divisions.

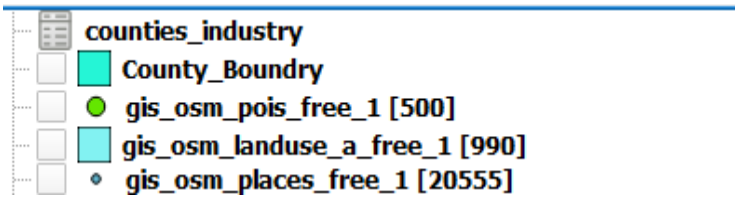
- **Examining and Refining the data using Excel.**

After removing redundant columns, four new columns are created to calculate proportions of industries in various counties across Ireland.

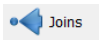
GUID	GEOGDESC	prop_type_1	prop_type_2	prop_type_3	prop_type_4
EB9428B8	Cork City	0.134655954	2.663572694	2.473472734	2.719890631
84B85B58	Clare	3.841061089	3.0830092	1.998277321	2.444970513

Ex: - prop_type_1 for first row = (D2/SUM(D2:D32)*100)

- **Importing this data along with the boundary files of counties into QGIS.**



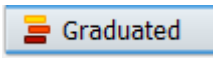
- **Loading this data into PostGIS for creating join, view and analysis.**



are then created for the boundary files with the data in.

Views are also created for better interpretation and further analysis. This data is then loaded back to QGIS.

- **Maps Creation and Visualization**

The newly added layers are re-named and using the newly added columns containing proportions, **Choropleth maps** are created via a 

scheme **with different modes**, **colours and transparency** to see the underneath OSM layer for better visualization.

- **Equal Interval, Quantile, Natural Breaks (Jenks).**
- **Labels to represent County names.**
- **Spectral, Blues, Greens, YlOrBr schemes used.**

The intervals suggest the percentage penetration of various types of industries in Ireland counties.

The top county in each category has been further analyzed and represented on Web Maps to have a closer look at them.

In Type 1, County Cork leads in terms of Agriculture and Forestry with 13% penetration in Ireland.

In Type 2, County Cork again dominates in terms of Industrial and Manufacturing with around 12% coverage.

In Type 3, Dublin City prevails dominantly in terms of Commerce, Trade and Transport with 16% sector.

In Type 4, Dublin City is the leader having industries twice that of remaining counties in sectors like Administration, Professional services, Hospitality etc. with approximately 14% coverage.

Choropleth Maps: -

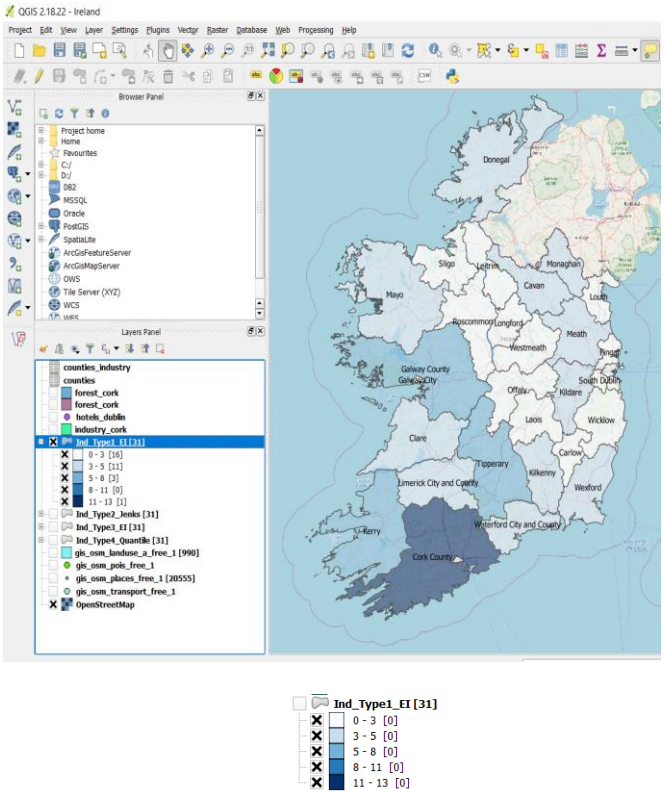


Fig 1. Type 1 Industries

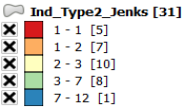


Fig 2. Type 2 Industries

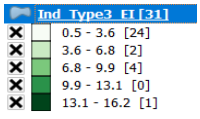
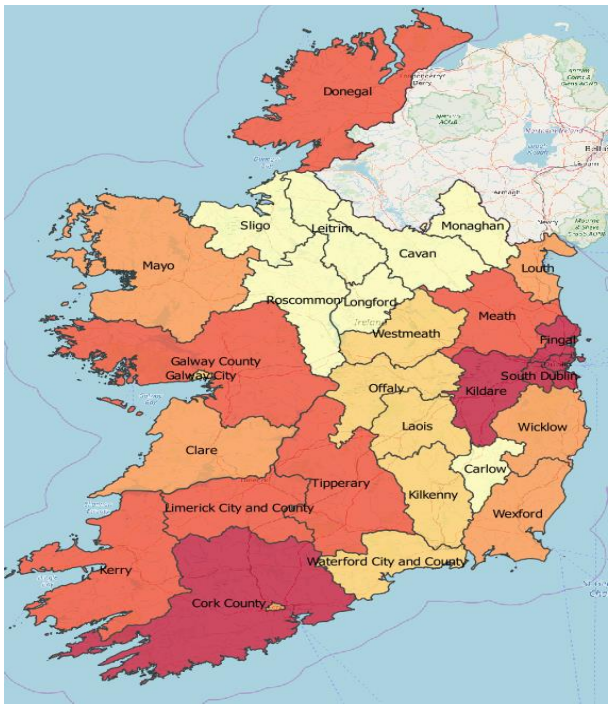


Fig 3. Type 3 Industries



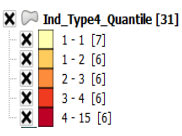


Fig 4. Type 4 Industries

Web Maps: -

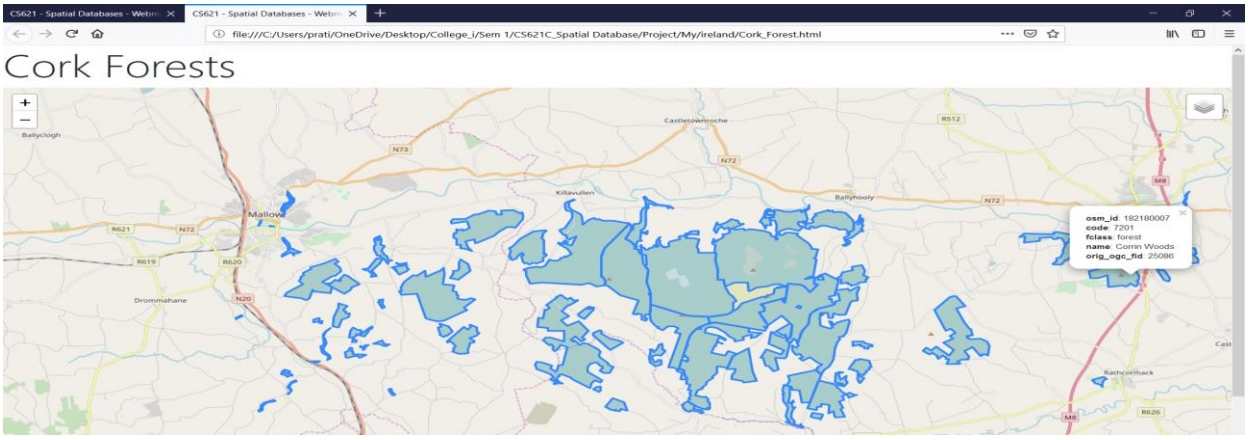


Fig 5. Web Based Map for Cork County with Forests as polygons - (Type 1 Industry)

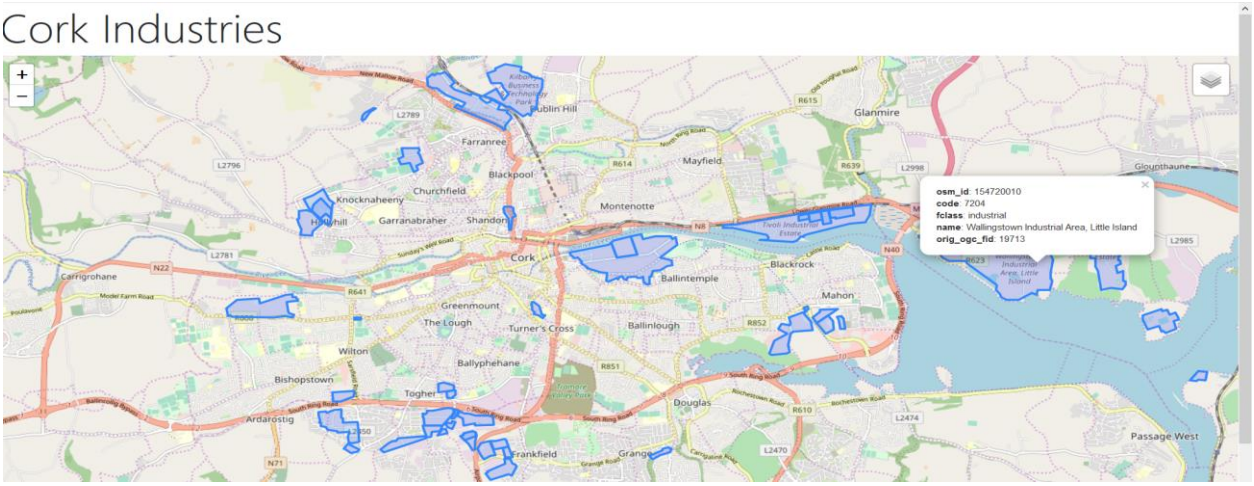


Fig 6. Web Based Map for Cork County with Industries as polygons – (Type 2 Industry)

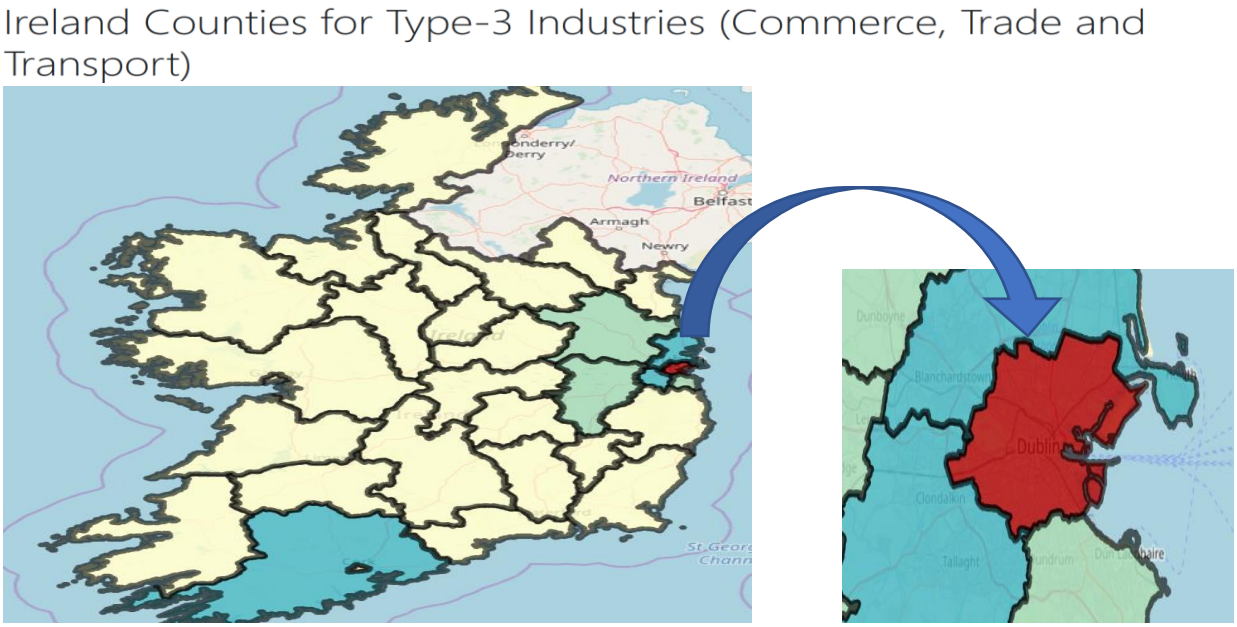


Fig 7. Web Choropleth Map for Commerce and Trade in Ireland {Dublin (Red – highest)} – (Type 3 Industries)

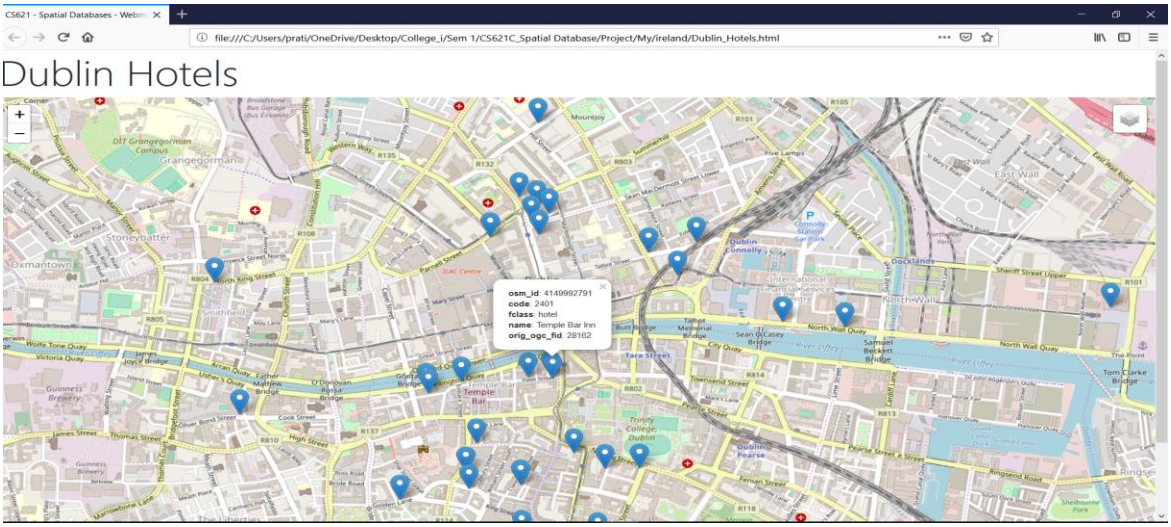


Fig 8. Web Based Map for Dublin with Hotels as Points – (Type 4 Industry)

Heat Map: -

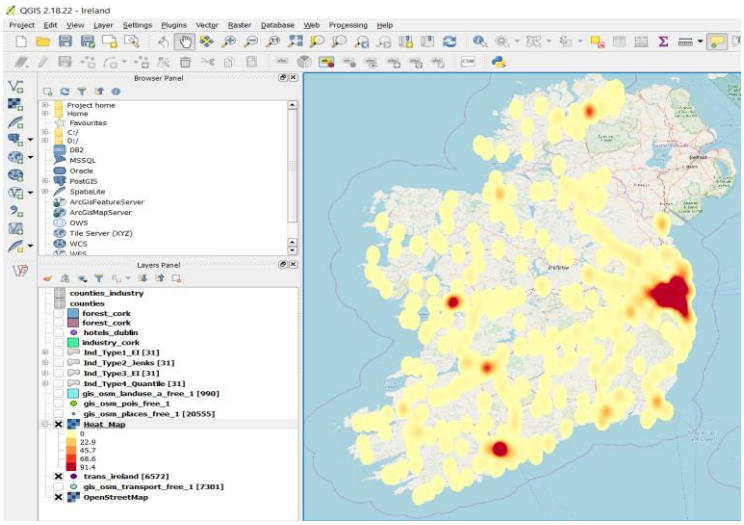


Fig 9. Heat Map of Transport Sector in Ireland {Dublin highest density} – (Type 3 Industry)

Conclusions

Results of the analysis from the spatial data shows that Dublin and Cork have dominant industries and this is precisely due to the larger population, suitable geographical location and better land area segmentation. About 35% of Ireland's population is concentrated in these areas as they are developed and cater most software companies, businesses and have some of the best educational institutes.

The classification levels in the choropleth maps with different colors depict that the second highest group of industrial penetration are in counties like Fingal, Galway, Kildare, Limerick, Kerry, Meath etc. The least developed counites like Longford, Leitrim, Sligo, Roscommon, Monaghan etc are located in the northern part of Ireland and have least number of people working in any industry. This is primarily because of the rural locality, lack of infrastructure and smaller population.

With the help of QGIS and PostGIS we were able to analyze and visualize spatial data easily. With the help of special features in QGIS, we succeeded in drawing conclusions about the industrial pattern from different maps across counties in Ireland.