

# Clustering Towns in Dublin City

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# Introduction to the Problem

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- This is a project **clustering the towns within Dublin**, the capital city of Ireland. This is a useful exercise as there is no readily available data set for even the location of towns within, readily available online.
- The visualisation of the towns within each postcode and the clustering of these towns gives a great insight into the city of over 1.3 million residents.

# Data Acquisition

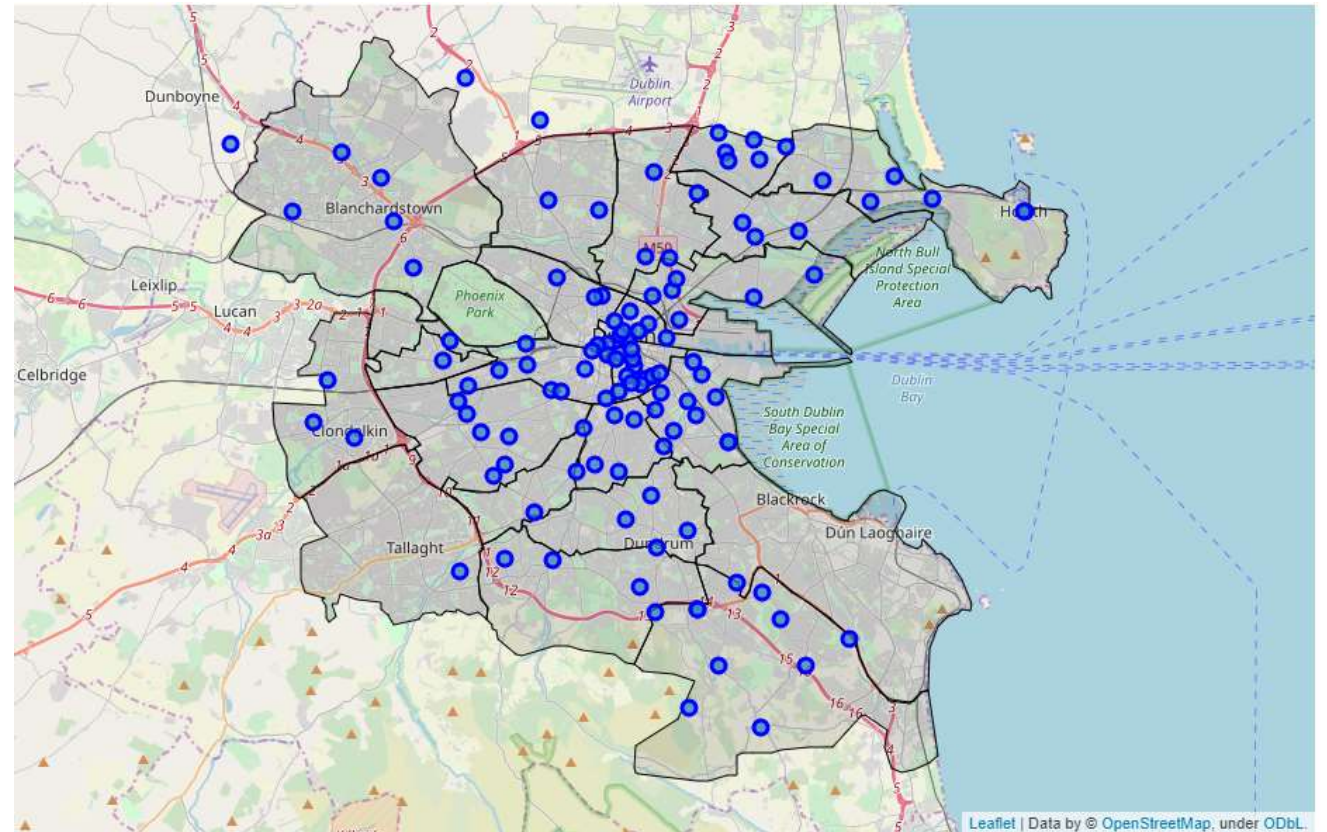
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- A list of Dublin towns, sub grouped by postcode was used from <http://www.dublinitourist.com/maps/dublin-postal-codes/> . The coordinate data was found using the imported python module Nominatim from the geopy.geocoders package.
- The Choropleth maps are created using a geojson file of the Dublin Postcodes. [https://github.com/AugmentedGeoBae/GeoCluster/blob/master/public/GeoJSON/DublinPostcodes\\_4326.geojson](https://github.com/AugmentedGeoBae/GeoCluster/blob/master/public/GeoJSON/DublinPostcodes_4326.geojson) This data split up the city of Dublin into sections bounded by the postcode.

# Visualizing Data

	Town	Area	Address	Latitude	Longitude
0	Abbey St	Dublin 1	Abbey St, Dublin 1, Ireland	53.348502	-6.258542
1	Amiens St	Dublin 1	Amiens St, Dublin 1, Ireland	53.352835	-6.248753
2	Capel St	Dublin 1	Capel St, Dublin 1, Ireland	53.347422	-6.268409
3	Henry St	Dublin 1	Henry St, Dublin 1, Ireland	53.349549	-6.261979
4	Mountjoy Sq	Dublin 1	Mountjoy Sq, Dublin 1, Ireland	53.356608	-6.257516

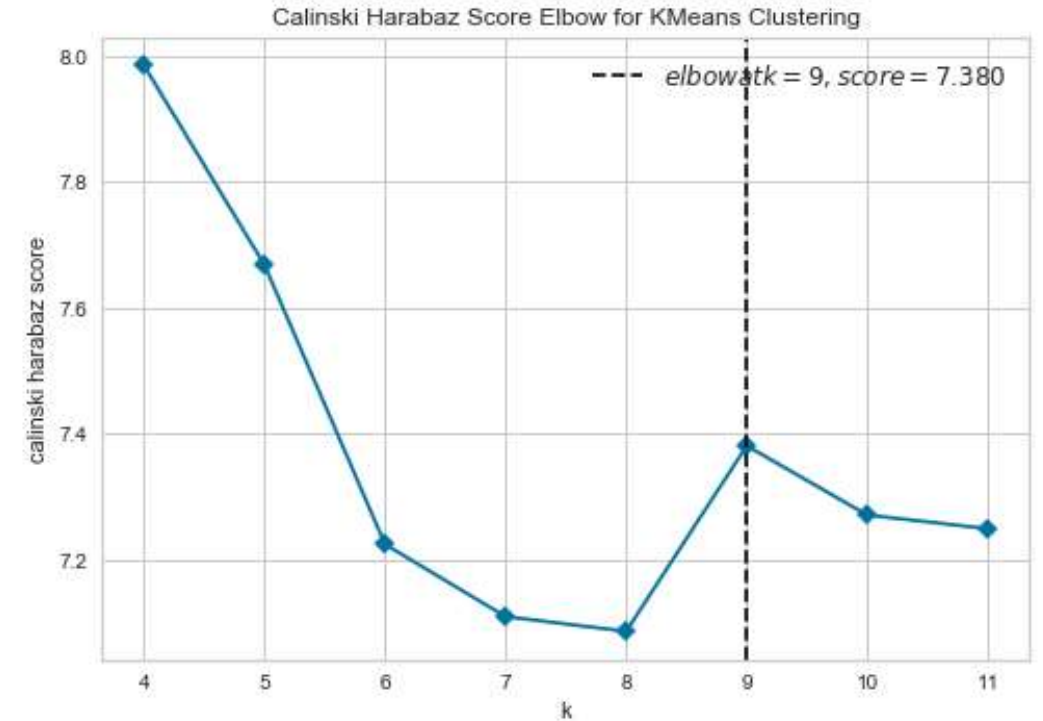
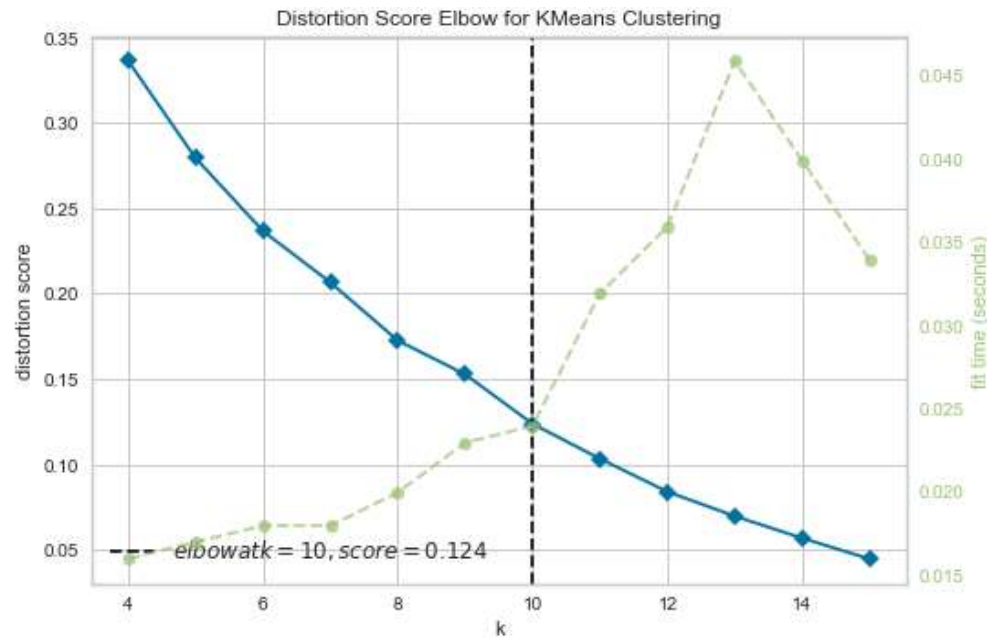
- Mapping 120 Dublin towns in 20 postcode areas



# Foursquare API Call

	Address	Area	Town	AddressLat	AddressLong	Venue	VenueLat	VenueLong	Category
0	Abbey St, Dublin 1, Ireland	Dublin 1	Abbey St	53.348502	[-6.2585416, -6.2487534, -6.2684092, -6.261978...]	Offbeat Donut Co	53.347435	-6.255535	Donut Shop
1	Abbey St, Dublin 1, Ireland	Dublin 1	Abbey St	53.348502	[-6.2585416, -6.2487534, -6.2684092, -6.261978...]	Cassidy's Bar	53.346343	-6.259035	Pub
2	Abbey St, Dublin 1, Ireland	Dublin 1	Abbey St	53.348502	[-6.2585416, -6.2487534, -6.2684092, -6.261978...]	Vice Coffee Inc.	53.347915	-6.262327	Coffee Shop
3	Abbey St, Dublin 1, Ireland	Dublin 1	Abbey St	53.348502	[-6.2585416, -6.2487534, -6.2684092, -6.261978...]	Abbey Theatre	53.348542	-6.257492	Theater
4	Abbey St, Dublin 1, Ireland	Dublin 1	Abbey St	53.348502	[-6.2585416, -6.2487534, -6.2684092, -6.261978...]	Pull&Bear	53.349533	-6.262053	Clothing Store

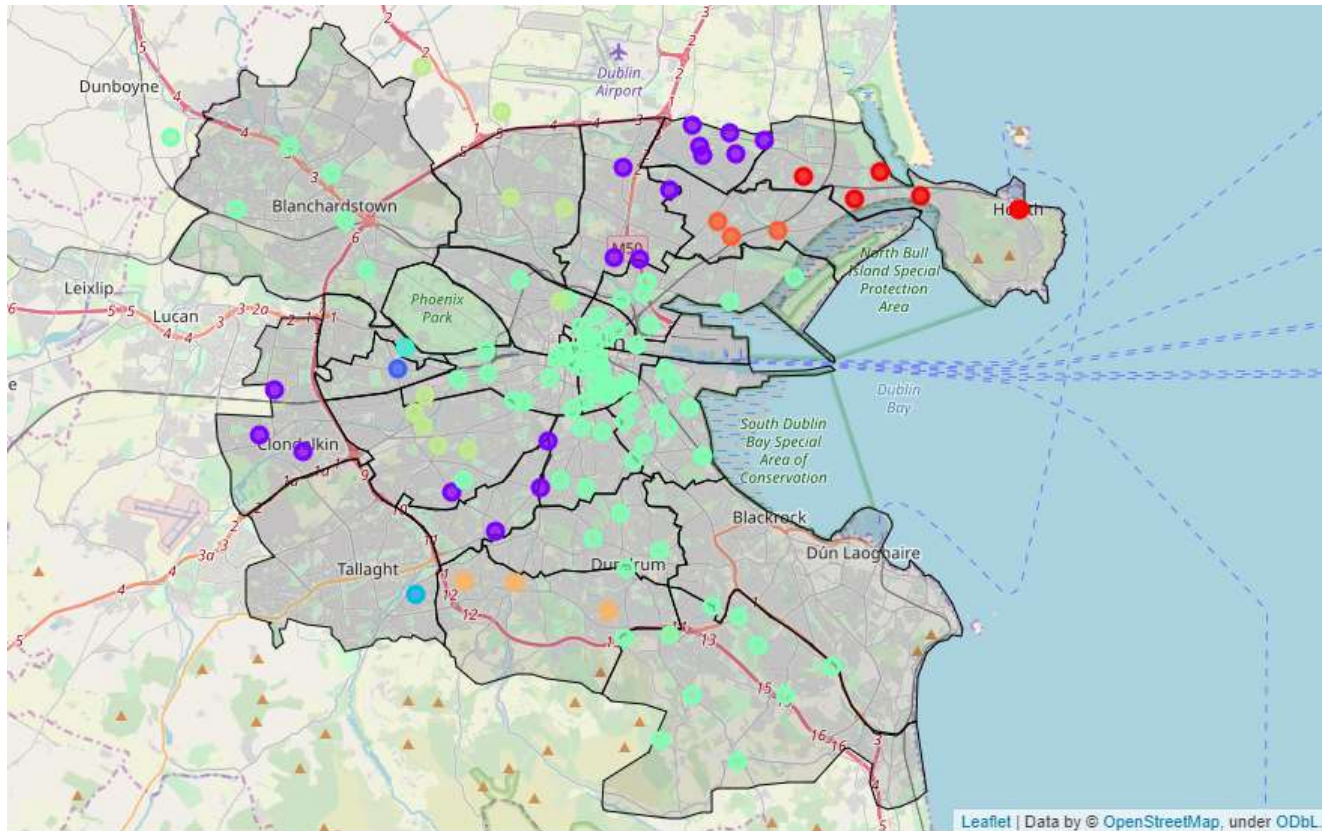
- The longitude and latitude of each town was searched in Foursquare and returns the venues near that location. A radius of 700m and a limit of 200 venues per location was used to limit the search. 3988 venue results were returned.
- There are over 220 venue category values. Each of the postcode are then grouped by category as the category is the feature we care about most.



# Using K-means to cluster Dublin



# Results – 9 Clusters



Cluster Labels	Count	Town
0	17	Harold's Cross, Templeogue, Terenure, Beaumont, Dr...
1	1	Ballyfermot
2	1	Firhouse
3	2	Chapelizod, Palmerstown
4	75	Abbey St, Amiens St, Capel St, Henry St, Mountjoy ...
5	11	Cappagh, Cremore, Dubber, Finglas, Jamestown, Kilsh...
6	4	Ballinteer, Ballyboden, Knocklyon, Sandyford
7	3	Artane, Harmonstown, Raheny
8	6	Baily, Baldoyle, Bayside, Donaghmede, Sutton, Howth

# Conclusion & Future Extensions

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- There is a massively disproportionate amount of towns seen in cluster 4. The 75 towns in this cluster are shown in light Turquoise on the map above.
- Most of these towns are within the centre of Dublin city. With a lot of retail venues such as shops and shopping centres and a large number of food venues.
- It is also seen that this large cluster seems to have two arms, reaching out to the areas of Blanchardstown in the NW of the map, and out to Dundrum in the SE of the map.
- The two largest shopping centres in Dublin are located in Blanchardstown and in Dundrum.
- Perhaps an extension to this project is to use this clustered data to build a decision tree classifier. This could be used to recommend certain areas, based on what type of facilities and venues are in that area.