Locating best alternatives for client moving to Melbourne
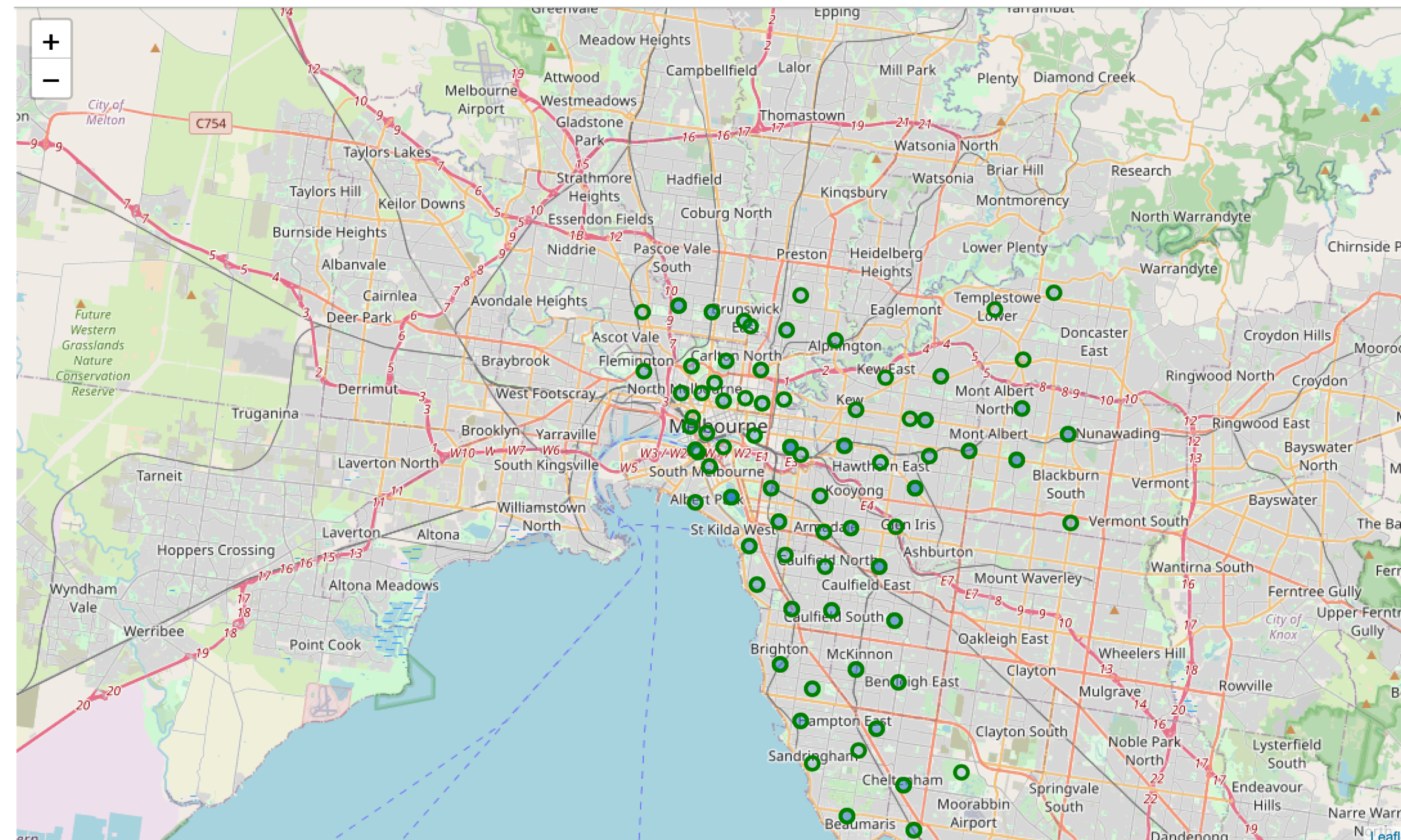
Problem Statement

- My client will move to Melbourne soon. He likes Doncaster and its neighbourhood. However, he does not have a lot of budget and he would like to see if there are suburbs like Doncaster with lower house price. He is flexible with property type.

Data
Melbourne Suburb (neighbourhood) data

- The data include i) state, ii) borough, iii) locality (neighborhood), iv) longitude and latitude, v) postcode

- Data messaging was done to unify the name and data type, e.g. postcode is converted to int then string.

- This data will be used to find all the neighborhood in Melbourne. From the data, we see Greater Melbourne includes a lot of borough and we filter Inner Melbourne as the research base. Neighborhood information is plotted in map for better visualisation

Data
Suburb (neighbourhood) venue

- https://developer.foursquare.com/

- We take the neighborhood longitude and latitude and use the Foursquare API to pull nearby venues. The venues are then grouped by type and measure the frequency using one hot encoding. This will later be used to form k-mean cluster.

	index	Dist from Target	Neighborhood	PostCode	Long	Lat	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue
0	1	637.309802	ALBERT PARK	3206	144.950860	-37.846534	5	Café	Beach	Tram Station	Breakfast Spot	Asian Restaurant	Fishing Spot	Playground	Fast Food Restaurant
1	28	637.309802	BRIGHTON	3186	144.996329	-37.915066	5	Café	Supermarket	Bakery	Movie Theater	Sushi Restaurant	Chinese Restaurant	Restaurant	Italian Restaurant
2	12	822.833747	BALWYN NORTH	3104	145.081714	-37.793695	5	Tram Station	Gym	Shopping Mall	Deli / Bodega	Zoo Exhibit	Event Service	Eye Doctor	Falafel Restaurant
3	40	909.407981	BURWOOD EAST	3151	145.151119	-37.855230	5	Café	Supermarket	Burger Joint	Shopping Mall	Sandwich Place	Portuguese Restaurant	Bus Stop	Gym
4	78	NaN	DONCASTER	3108	145.125797	-37.786429	5	Café	Department Store	Dessert Shop	Multiplex	Coffee Shop	Sandwich Place	Electronics Store	Clothing Store

Data
Property Sold Price

- https://developer.domain.com.au/

- As house sold price is the key concern of my client who want to find lower cost alternatives, we have identified the data source from Australia largest estate agency domain.com.au and use their API on suburb performance statistic (https://api.domain.com.au/v2/suburbPerformanceStatistics/). The API will return median sold price, highest and lowest sold price. We have taken the .data in 2020 and house price with 3 rooms as a benchmark.

- We have used Live API Browser to understand the request and response details.
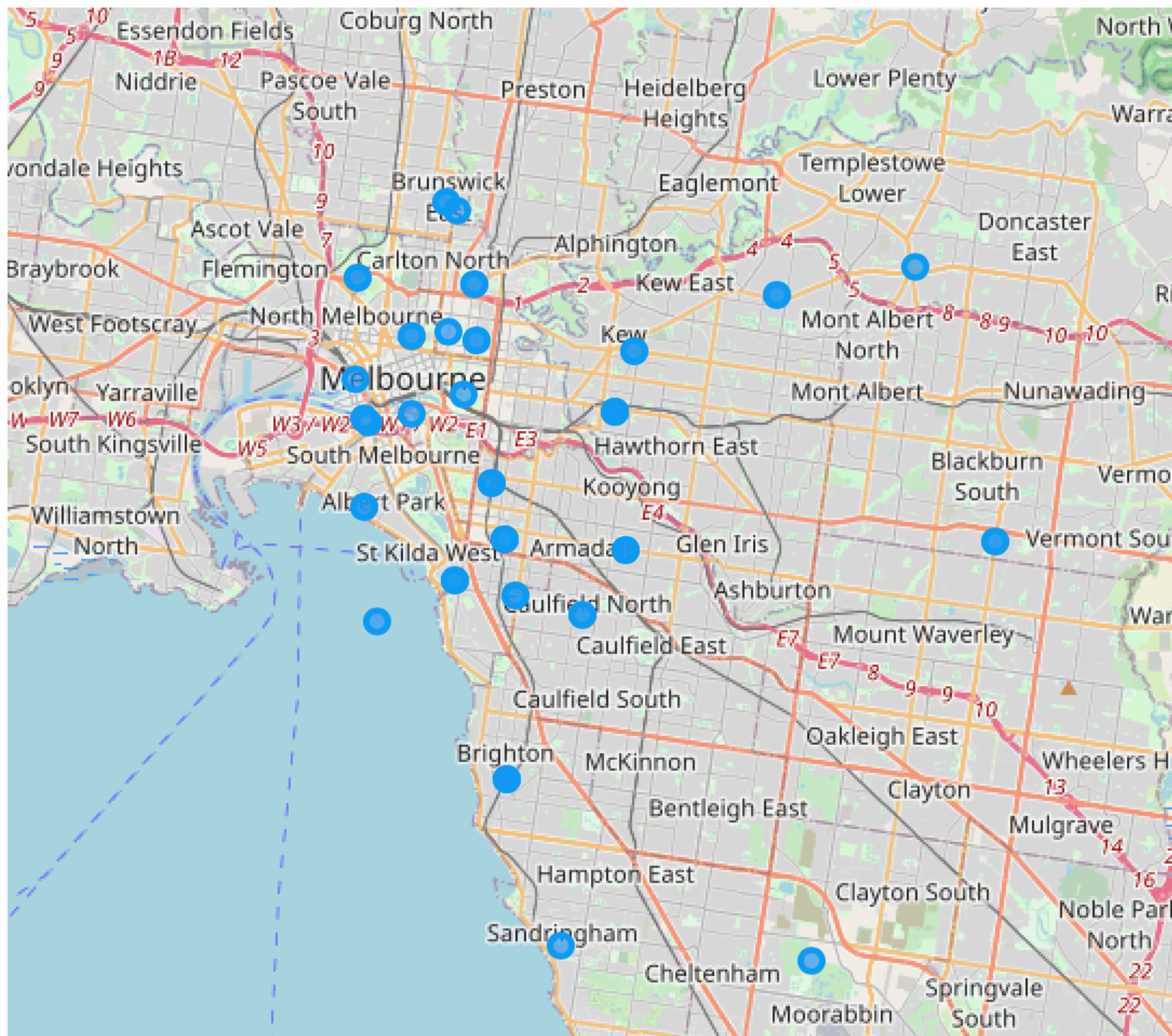
Methodology

How do we come up with our suggestions

- The client like the suburb Doncaster for the venues and facilities

- Use k-mean cluster to find suburbs that are similar to Doncaster

- Find suburbs that are close to Doncaster

- Present the median sold price in the suburbs and suggest alternatives

Results

- 54 suburbs found similar to Doncaster (using k = 20)

- Burwood East is the best option closet to Doncaster

	Neighborhood	Longtitude	Latitude	MedianSoldPrice	NumberSold	HighestSoldPrice	LowestSoldPrice
3	BURWOOD EAST	145.151119	-37.855230	992000	55	1801000	791000
4	DONCASTER	145.125797	-37.786429	1050000	49	1745000	595000
2	BALWYN NORTH	145.081714	-37.793695	1645000	60	2850000	1045000
0	ALBERT PARK	144.950860	-37.846534	2133000	38	7250000	1000000
1	BRIGHTON	144.996329	-37.915066	2143000	69	9750000	1085000