

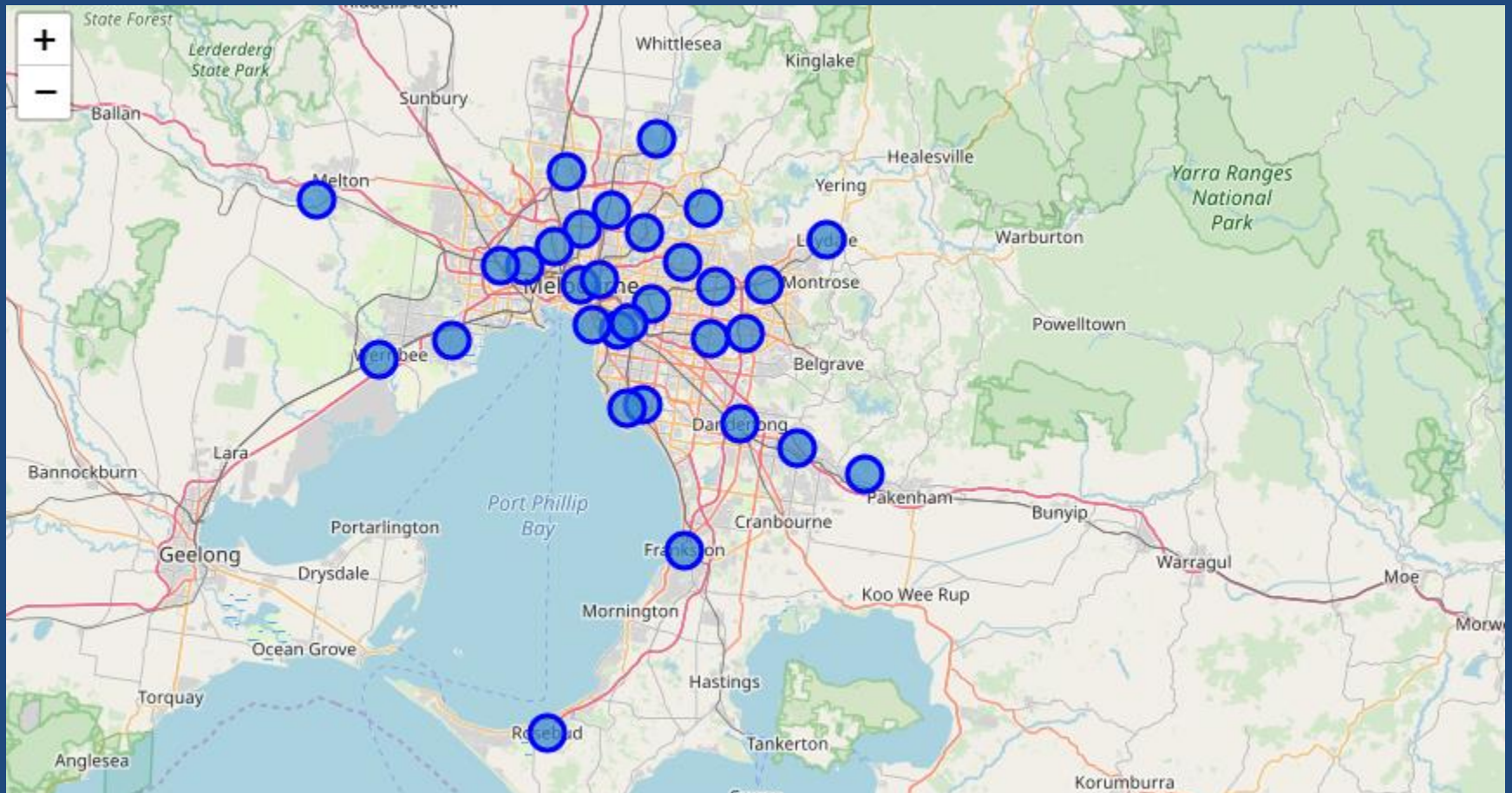


**Identifying optimal neighborhood in Melbourne , Australia  
to set up a bike service shop**

# Data

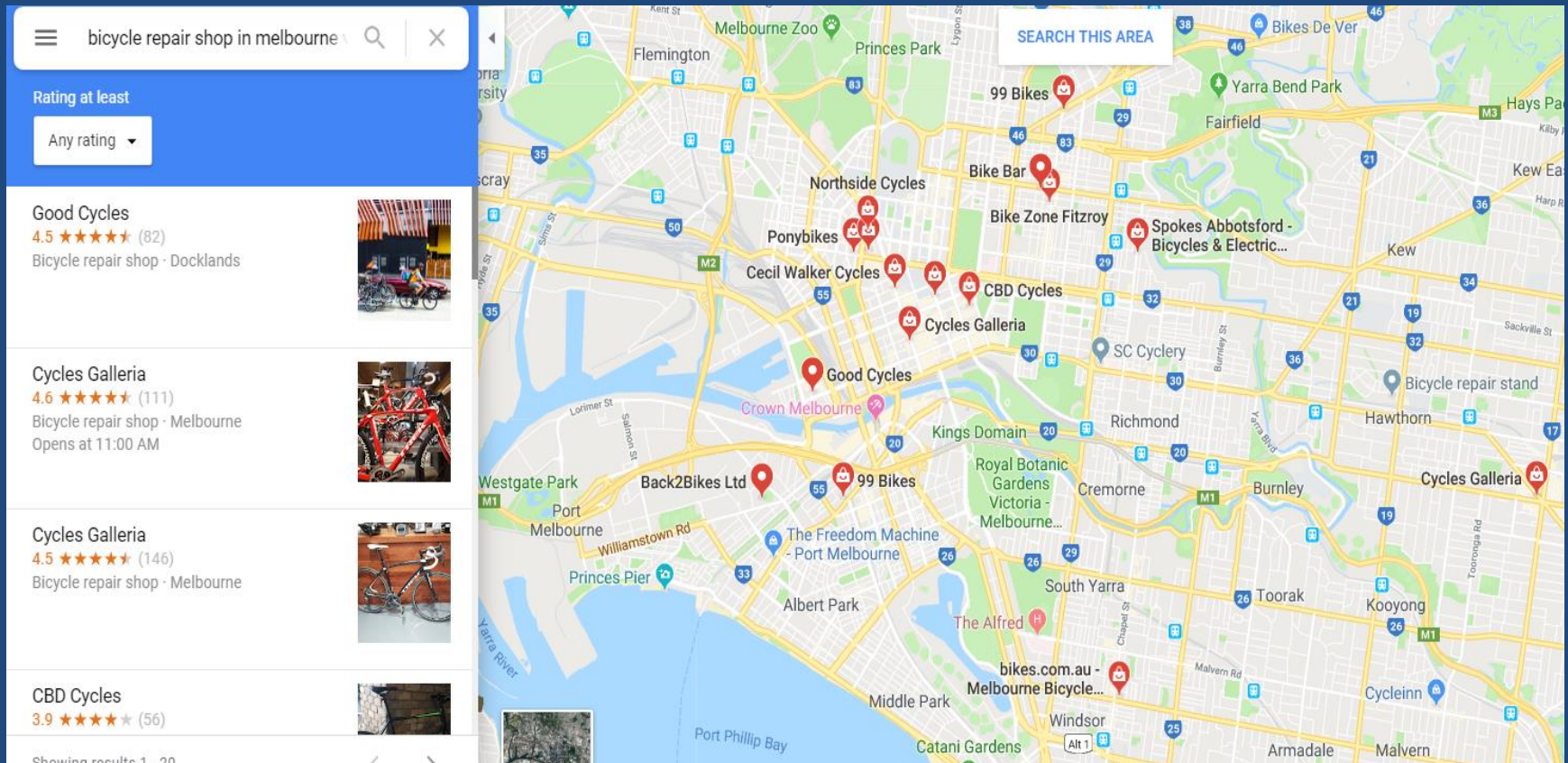
- **Wikipedia:** Where we scrape location and neighborhood data. This data will enable us to determine the number and names of neighborhoods and also provides data to proceed with mapping the neighborhoods using folium.
- **Google search:** Where we locate and get data on existing bike service shops in Melbourne area. We need to determine how many bike services shops already exist in Melbourne neighborhoods. So we need to do a search and find all the names and get their address. Once we get the address we can use geocoders to get location data and superimpose that data with neighborhood map
- **Australian Bureau of Statistics (ABS):** We will use ABS to gather population, median age, income for each neighborhood.
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- **Foursquare:** We will use Foursquare to determine venues for each neighborhood. This will be a major feature for our model.

# Map of Neighborhoods in Melbourne





# Locations for existing bike services shops



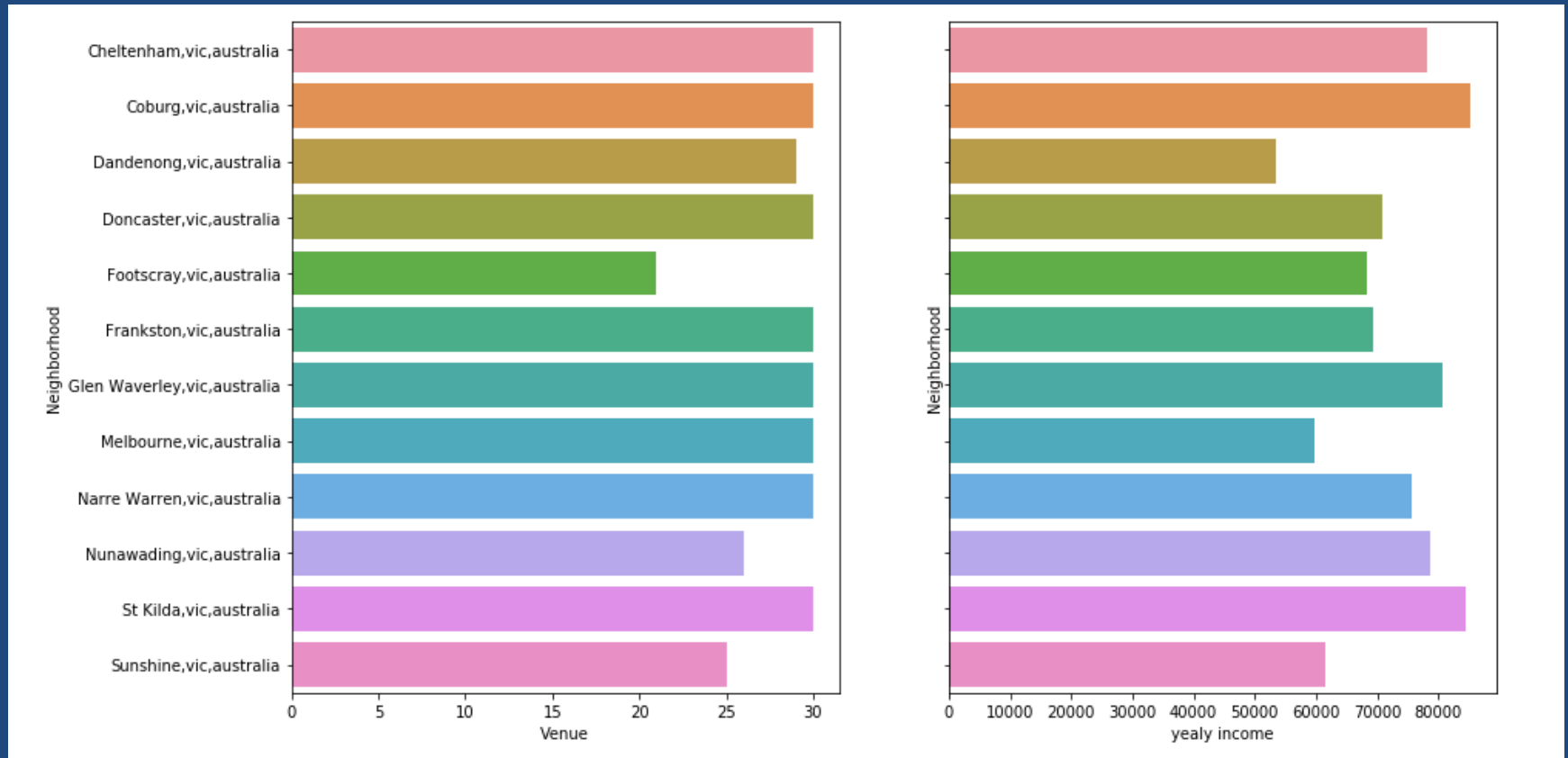
# Feature set Data Frame

|   | Neighborhood                  | Latitude   | Longitude  | population | median age | yealy income | Venue |
|---|-------------------------------|------------|------------|------------|------------|--------------|-------|
| 0 | Altona,vic,australia          | -37.883608 | 144.758616 | 12689      | 42         | 74880        | 5     |
| 1 | Broadmeadows,vic,australia    | -37.673105 | 144.940159 | 13305      | 31         | 47476        | 11    |
| 2 | Camberwell,vic,australia      | -37.838462 | 145.074077 | 21400      | 41         | 115024       | 14    |
| 3 | Caulfield North,vic,australia | -37.870828 | 145.021801 | 20967      | 34         | 99944        | 20    |
| 4 | Cheltenham,vic,australia      | -37.963418 | 145.061567 | 22291      | 40         | 78104        | 30    |

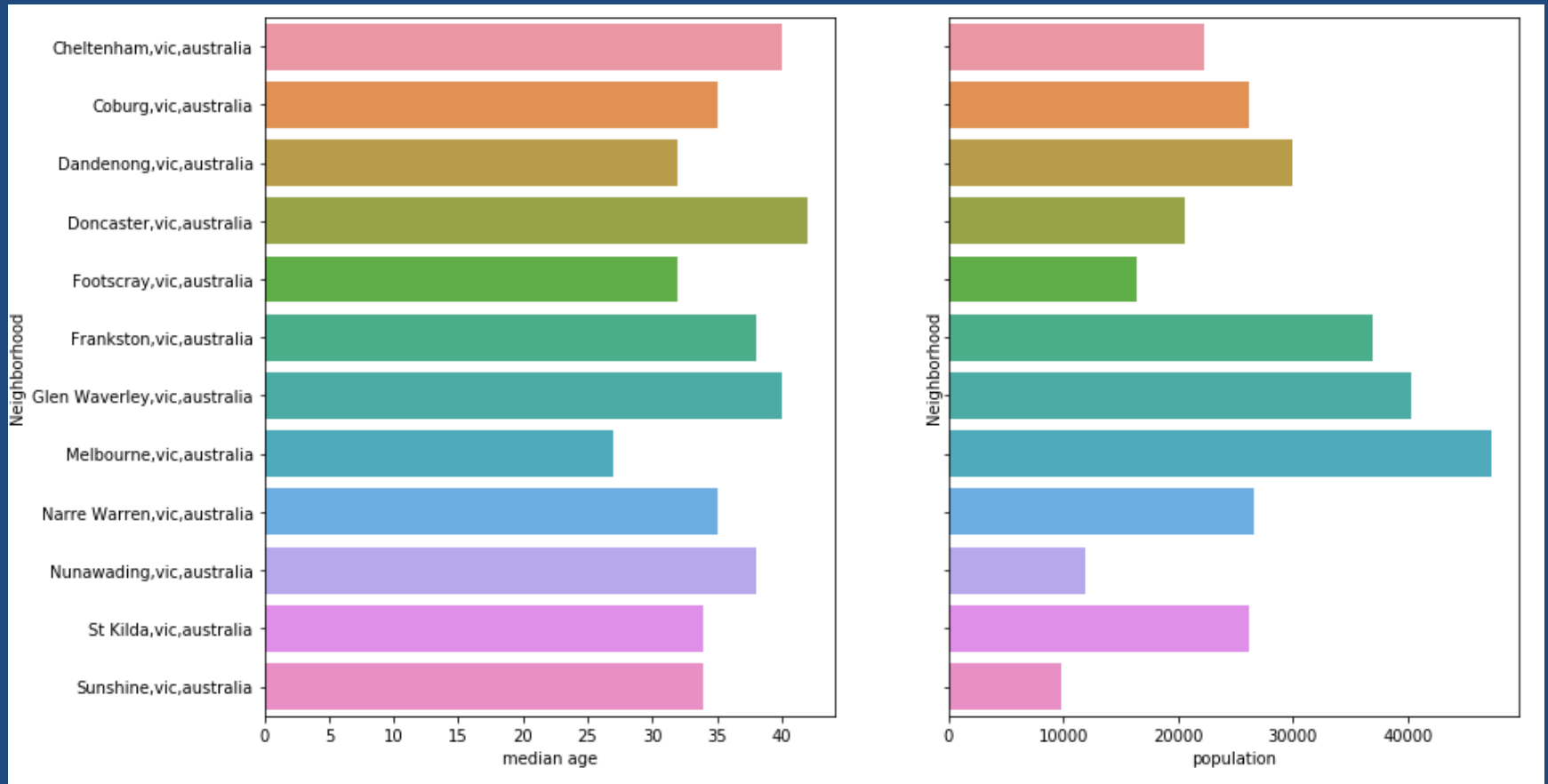
# Kmeans: Mean results per label

|        | Latitude   | Longitude  | population   | median age | yealy income  | Venue     |
|--------|------------|------------|--------------|------------|---------------|-----------|
| Labels |            |            |              |            |               |           |
| 0      | -37.800733 | 145.046198 | 16828.666667 | 38.833333  | 106903.333333 | 23.500000 |
| 1      | -37.883238 | 145.066264 | 26187.416667 | 35.583333  | 72158.666667  | 28.416667 |
| 2      | -37.870181 | 145.085983 | 13277.000000 | 37.875000  | 74061.000000  | 8.375000  |
| 3      | -37.840531 | 144.893311 | 57602.400000 | 36.600000  | 82326.400000  | 11.200000 |

# Label One – Neighborhood vs Venue and Yearly Income

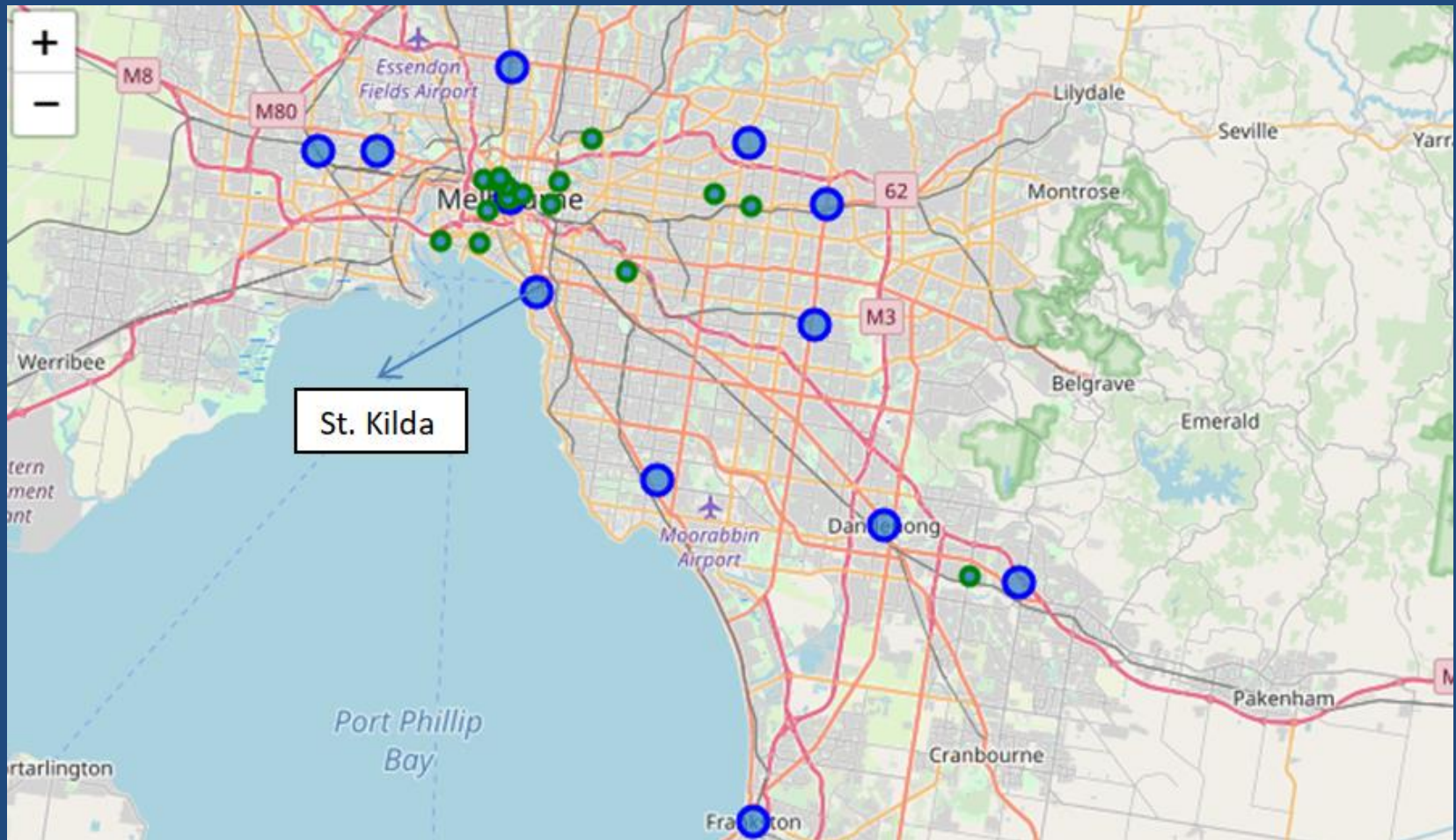


# Label One – Neighborhood vs median age and population





Cluster one results in blue with existing bike shops. The green dots in the map show where the existing bike shops are located.



# Winner is St. Kilda



|              |                        |
|--------------|------------------------|
| Neighborhood | St Kilda,vic,australia |
| Latitude     | -37.8638               |
| Longitude    | 144.982                |
| population   | 26124                  |
| median age   | 34                     |
| yealy income | 84500                  |
| Venue        | 30                     |
| Labels       | 1                      |