Identification of Ideal Locations for Student Accommodation

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Outline

Identify best areas around Nottingham Trent University for student accommodation

- University halls are limited in number, expensive and have access restrictions.
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How do we quantify best locations for accommodation business?

Data Wrangling

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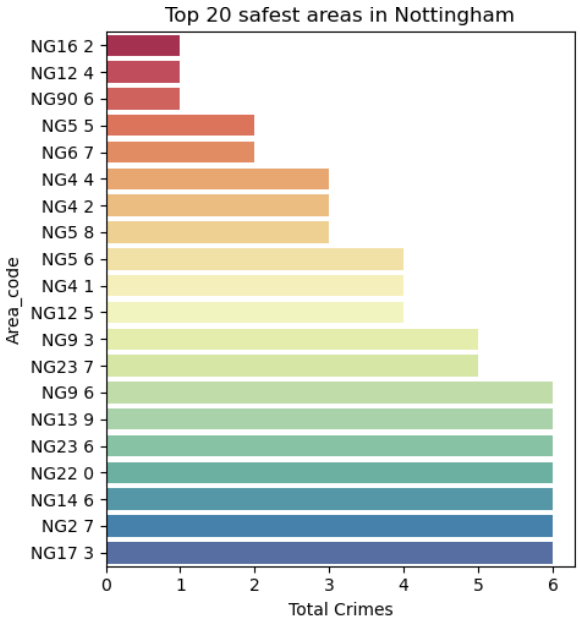
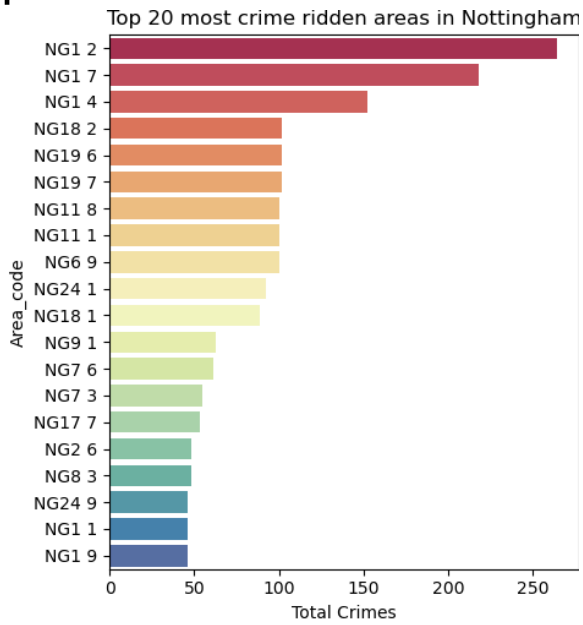
- Cleaned and merged data (13 features, 59 entries - 59 area codes)

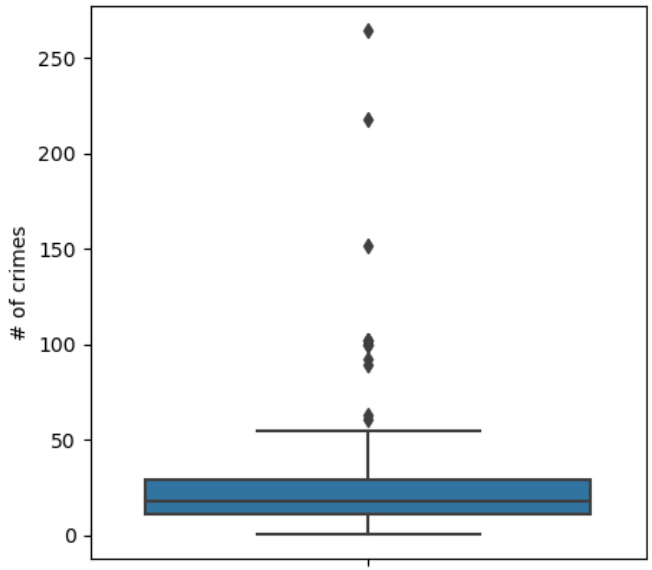
Reported crimes in Nottingham

Top 20 best and the worst areas based on crimes reported



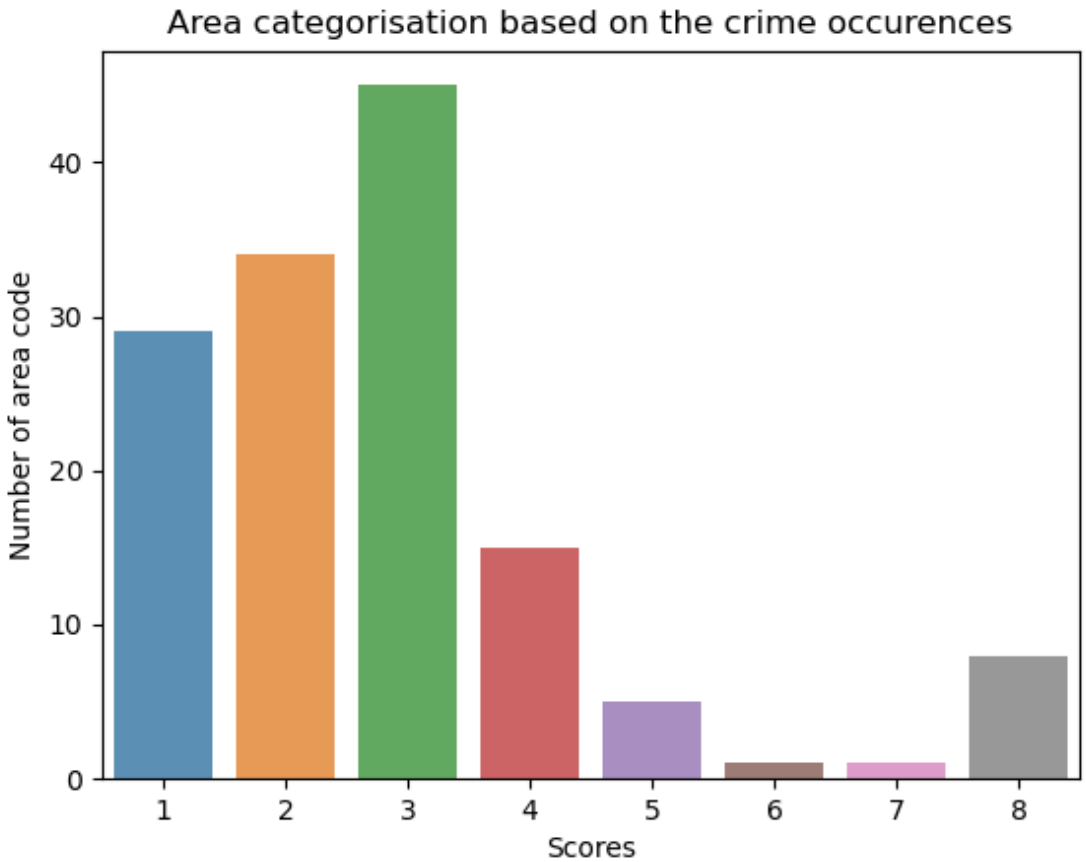


Distribution of crimes reported in Nottingham areas



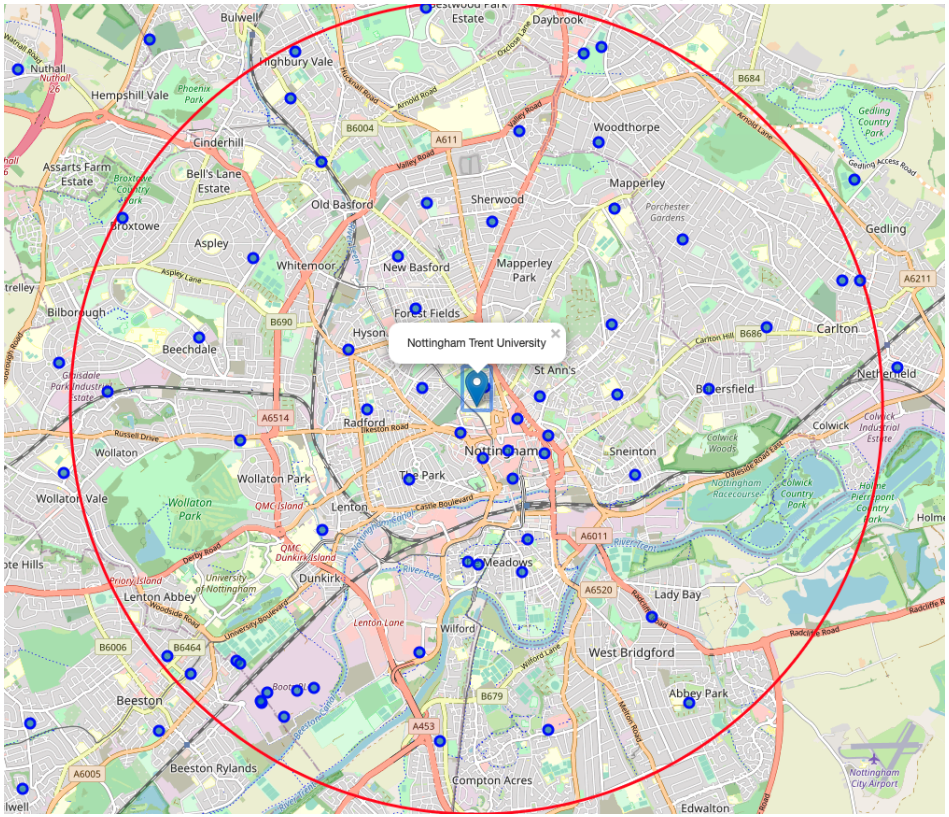
Area categorisation based on the engineered 'Crime score'

- Engineered crime scores

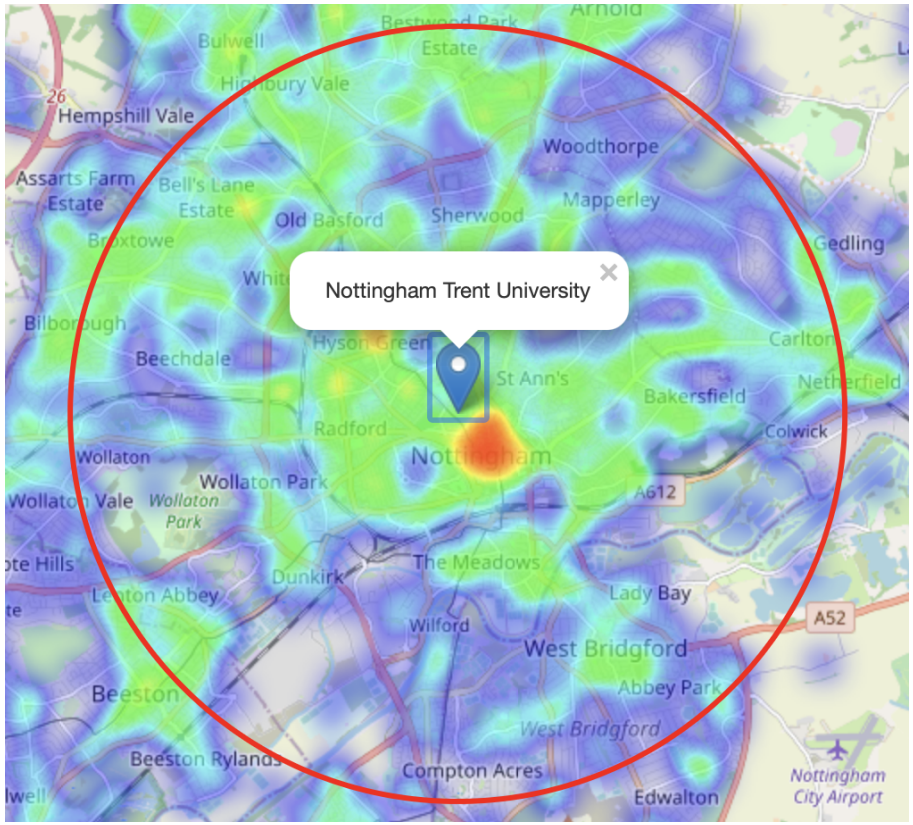


Geospatial visualisation

Area codes in Nottingham



Heatmap based on crimes reported



Top 20 venues within 5 km of NTU

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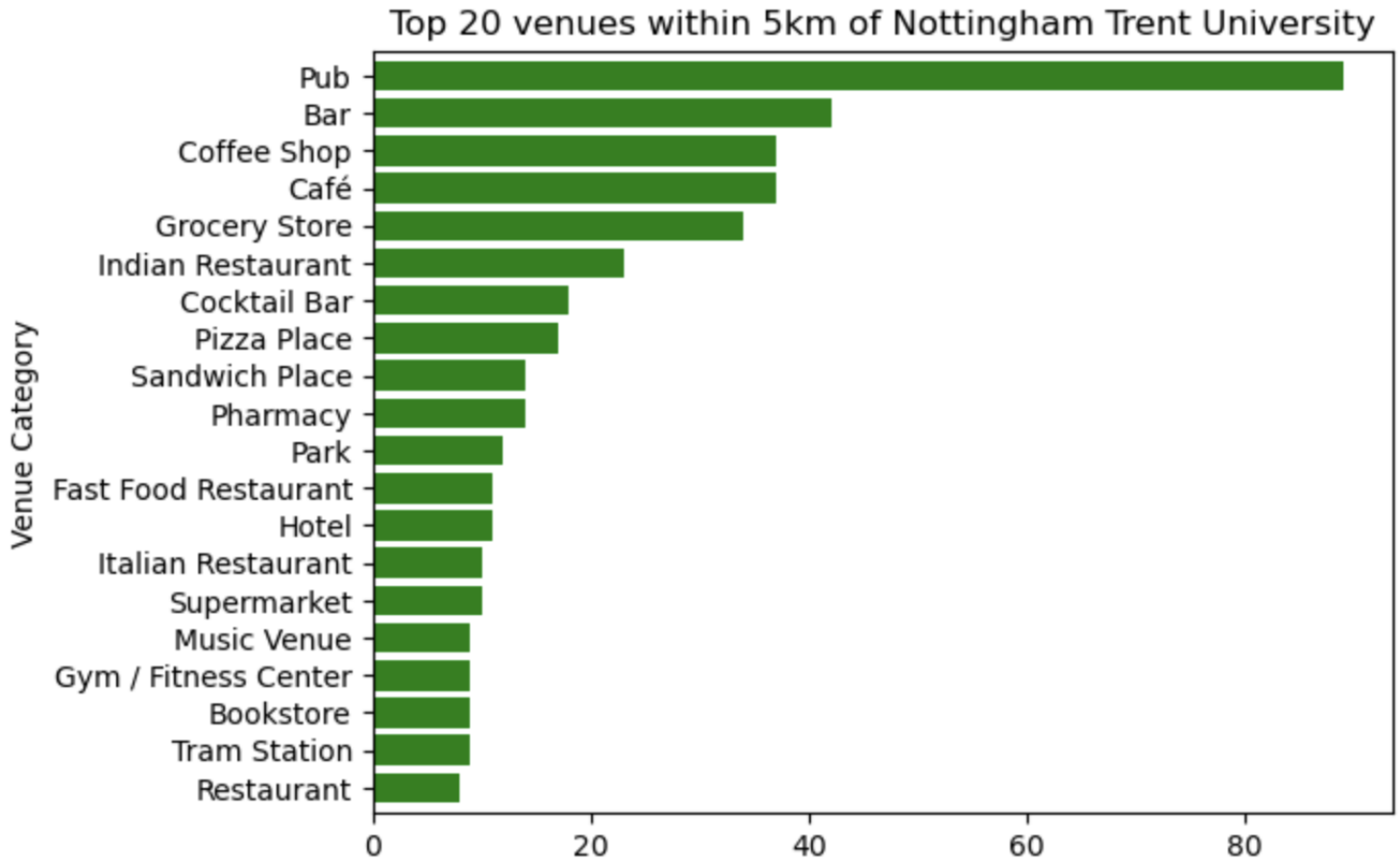
  Returns: {Venue, co-ordinates, category}
- Venues indicate a wide array of amenities available around NTU which is desirable.



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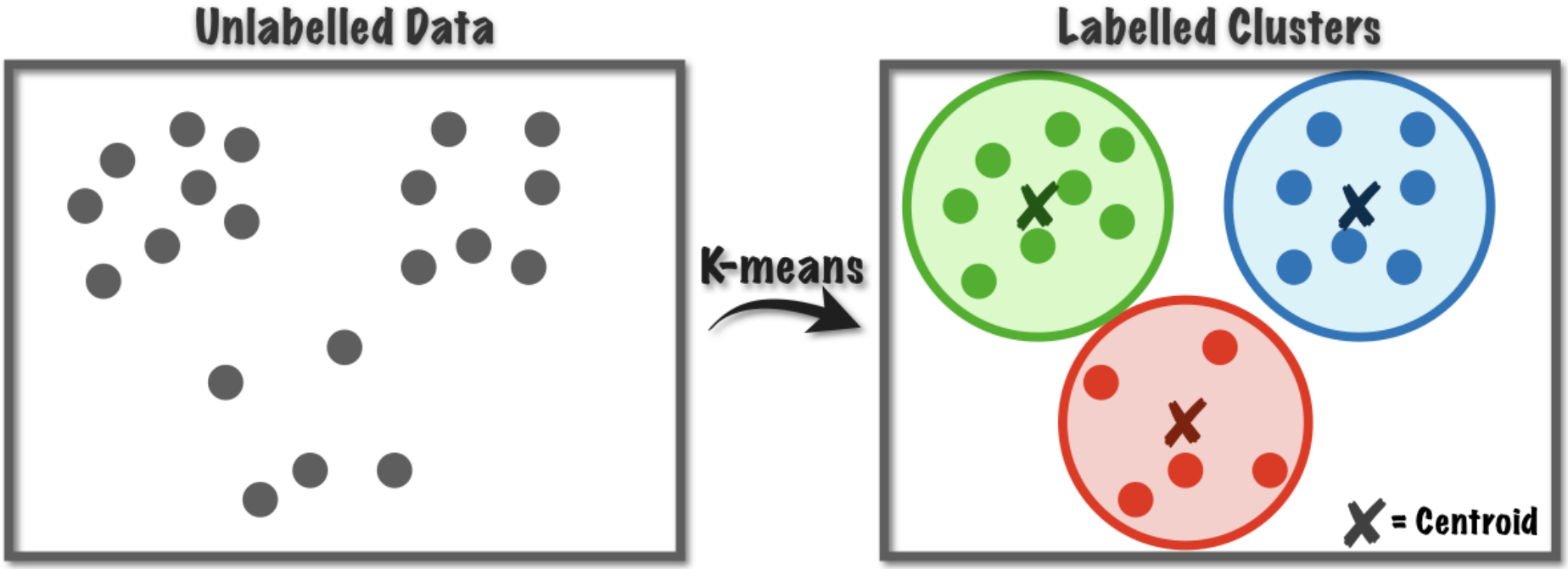

Source: https://towardsdatascience.com/k-means-a-complete-introduction-1702af9cd8c

Cluster analysis

- How to find the optimum number of cluster?

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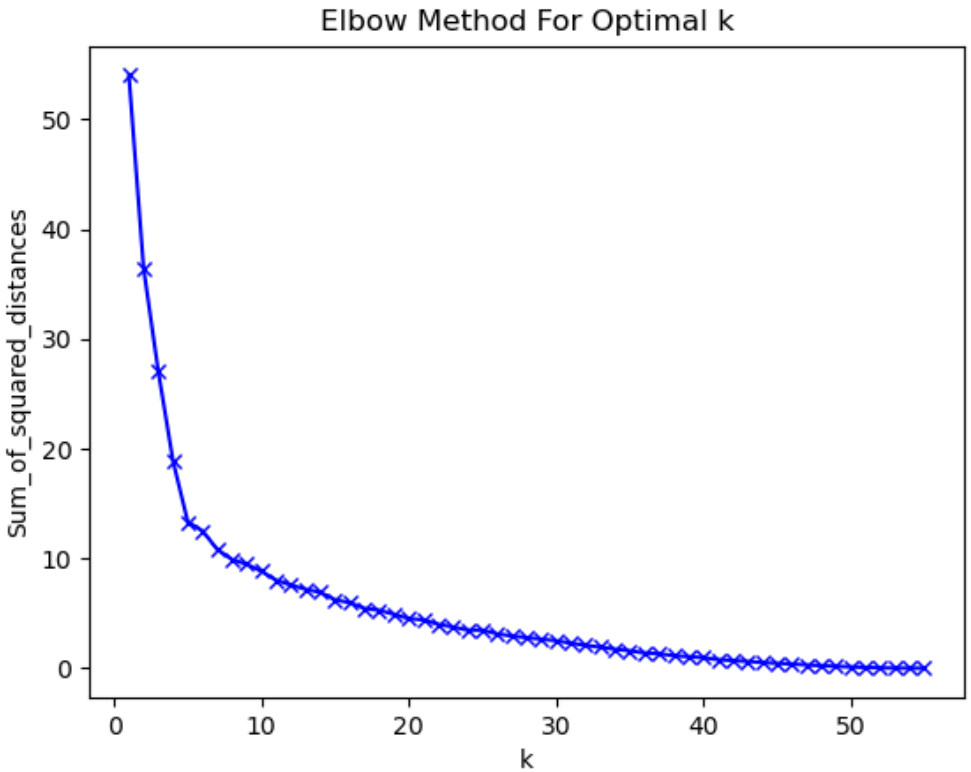
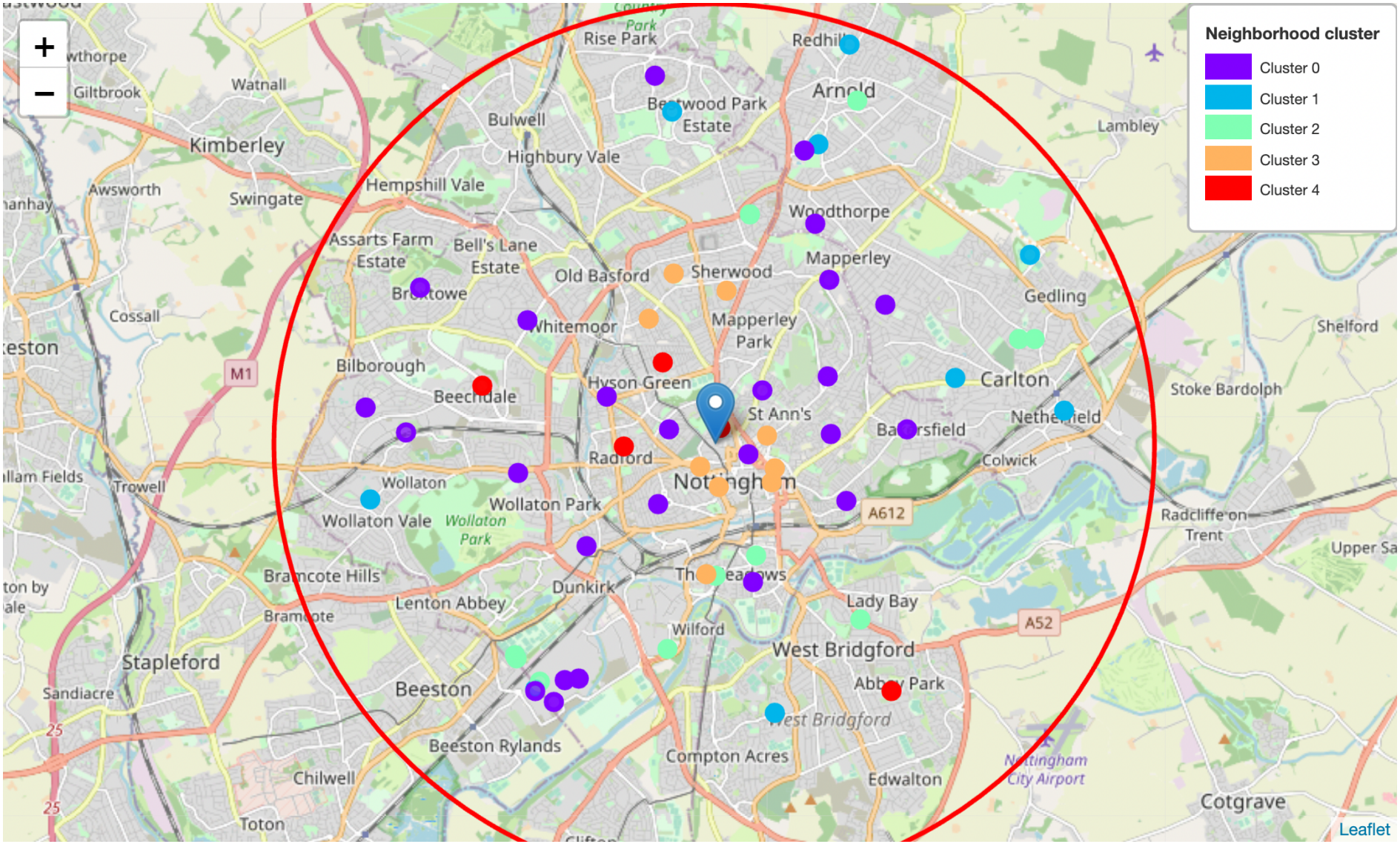
- Elbow method indicates 5 to be the optimum number of clusters.

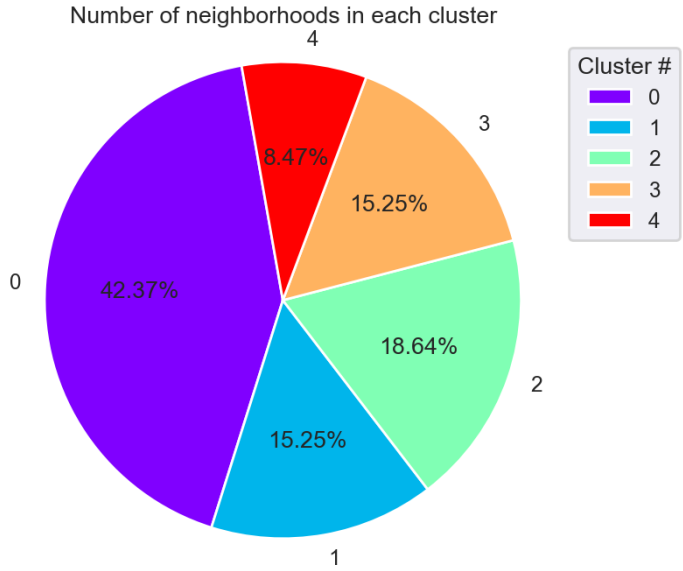


Cluster visualisation

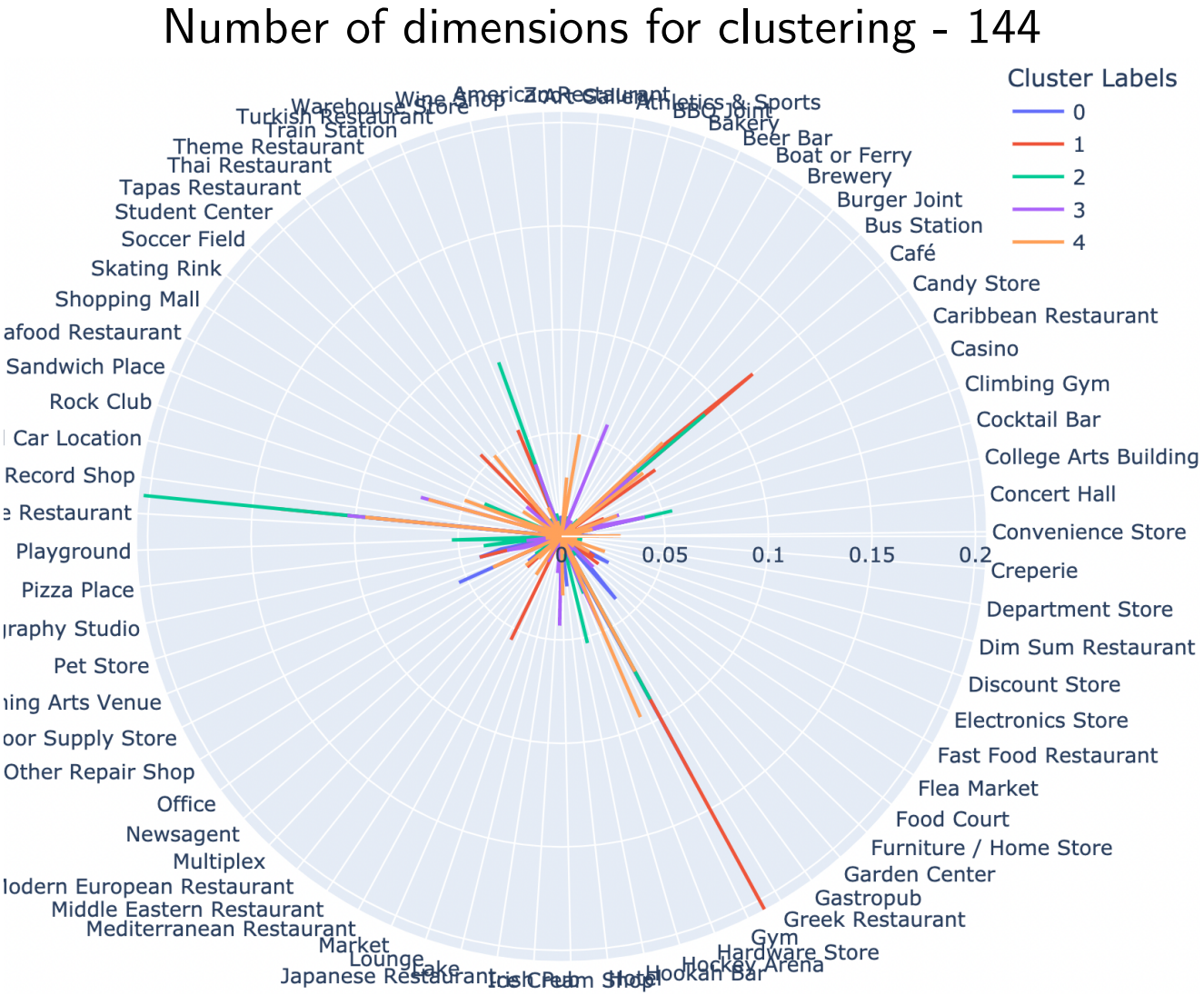


Clusters 1 and 3 offer best facilities of amenities.

Number of neighborhoods in each cluster



Visualisation of high dimensional data



Best areas that provide maximum connectivity and safety

Area codes in the best two clusters	
Cluster 0	Cluster 3
['NG1 3' 'NG7 2' 'NG7 4' 'NG7 5' 'NG7 1' 'NG3 6' 'NG3 4' 'NG3 3' 'NG3 7' 'NG3 2' 'NG3 5' 'NG2 2' 'NG2 4' 'NG8 1' 'NG8 6' 'NG8 4' 'NG8 9' 'NG8 5' 'NG90 5' 'NG90 4' 'NG90 7' 'NG5 0' 'NG5 9' 'NG5 4']	['NG1 1' 'NG1 9' 'NG1 5' 'NG1 6' 'NG7 7' 'NG3 1' 'NG2 1' 'NG5 2' 'NG5 1']

Table: Clusters and area codes within each cluster

Conclusions and future directions

- Explored Nottingham location around Nottingham Trent University and provided best areas to establish business for student accommodation.
- Identified two clusters of regions that offer best connectivity to amenities and safety.
- Further improvements:
  - Further categorise types of crimes.
  - Add transportation facilities data.
  - Add real estate values around the area data.
  - Dimensionality reduction (PCA - Principle Component Analysis)

Thank You