

Identification of Ideal Locations for Student Accommodation

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Outline

- 1 Business Problem
- 2 Data Wrangling
- 3 Exploratory Data Analysis
- 4 Results
- 5 Conclusions and improvements

Identify best areas around Nottingham Trent University for student accommodation

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How do we quantify best locations for accommodation business?

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 - Nottingham Crime data (12 features, 12,592 entries) - June 2021
 - NTU info - postcode

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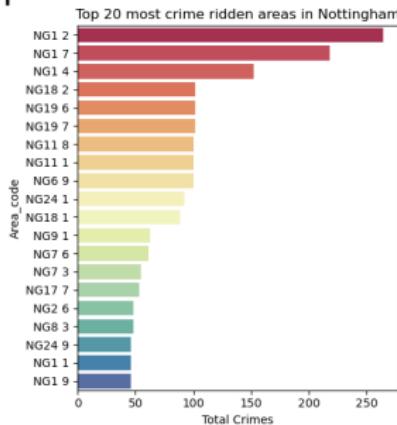
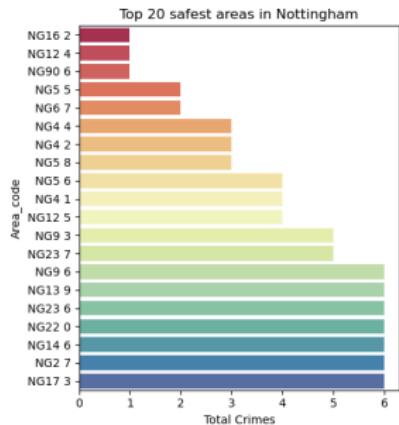
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 - Area code from postcode(eg. NG1 4)
 - Aggregating total crimes
 - Crime scores

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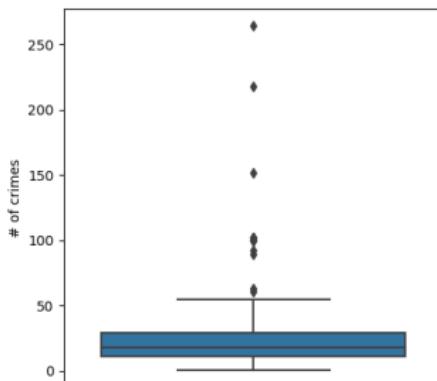
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- Cleaned and merged data (13 features, 59 entries - 59 area codes)

Reported crimes in Nottingham

Top 20 best and the worst areas based on crimes reported

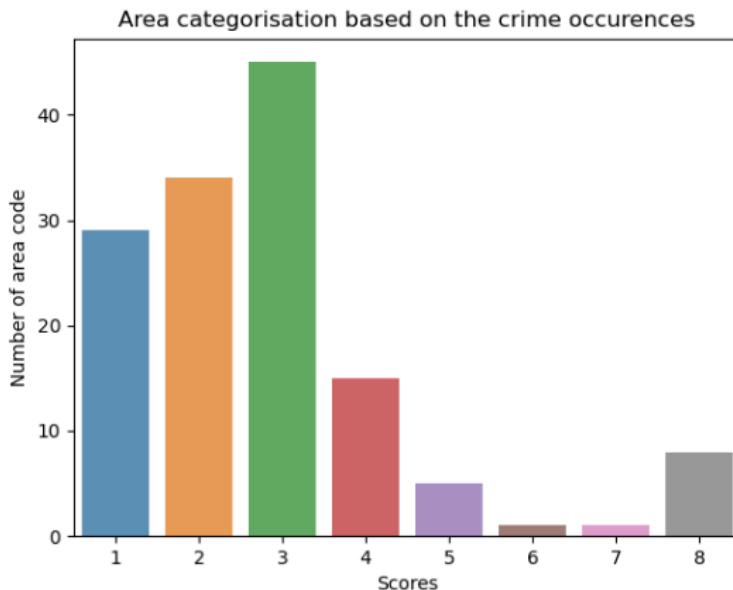


Distribution of crimes reported in Nottingham areas



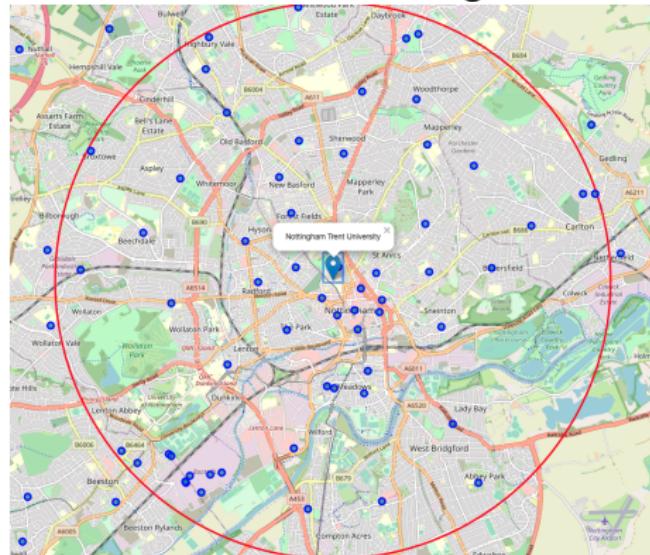
Area categorisation based on the engineered ‘Crime score’

- Engineered crime scores

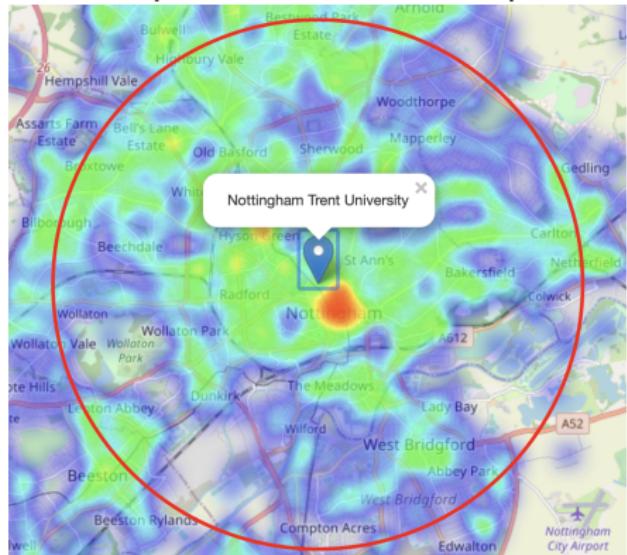


Geospatial visualisation

Area codes in Nottingham



Heatmap based on crimes reported



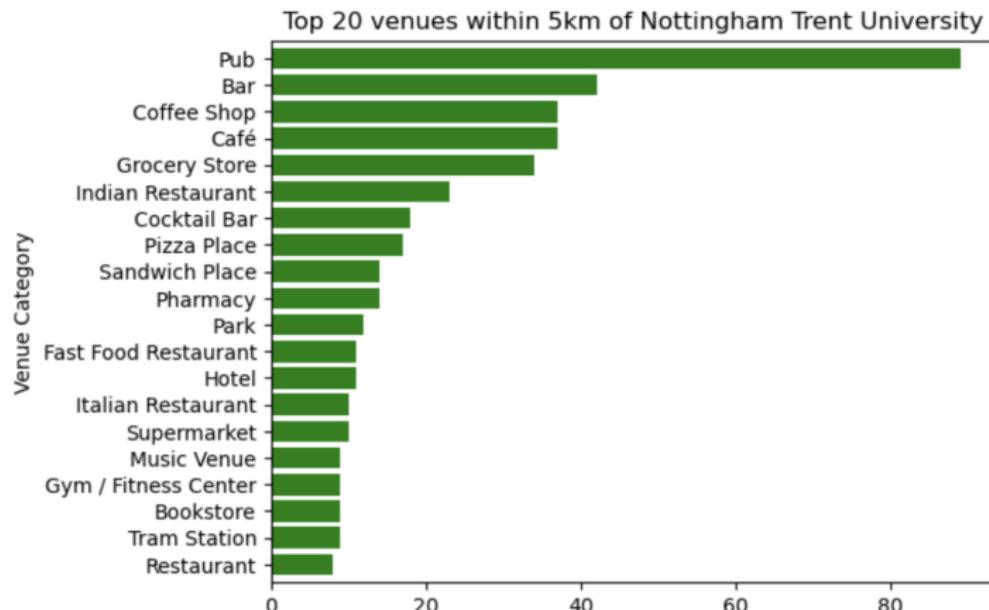
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- Foursquare API to get nearby venues.
Returns: {Venue, co-ordinates, category}
- Venues indicate a wide array of amenities available around NTU which is desirable.



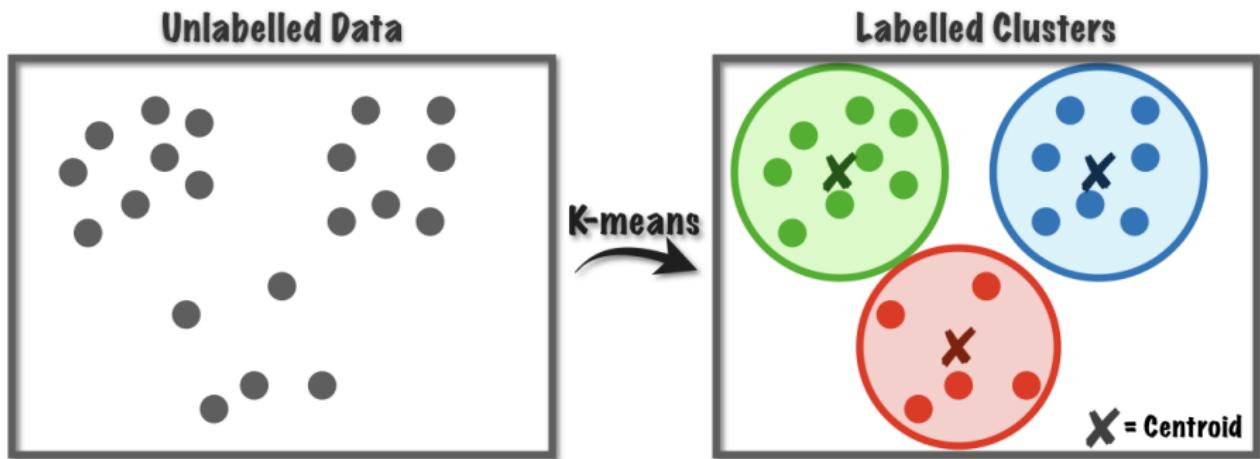
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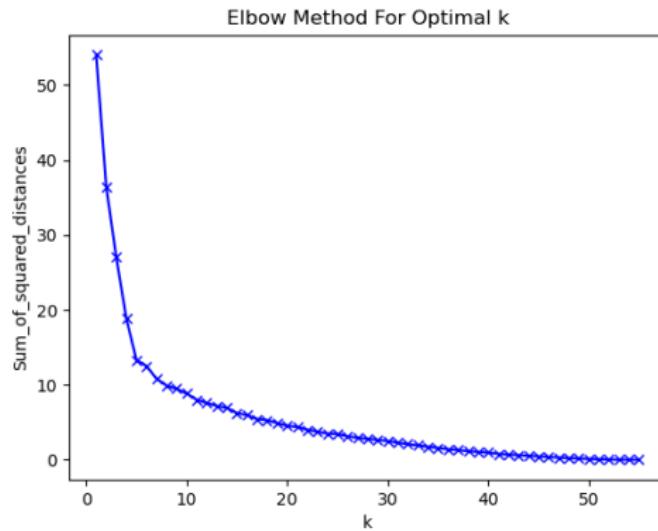
Source: <https://towardsdatascience.com/k-means-a-complete-introduction-1702af9cd8c>

Cluster analysis

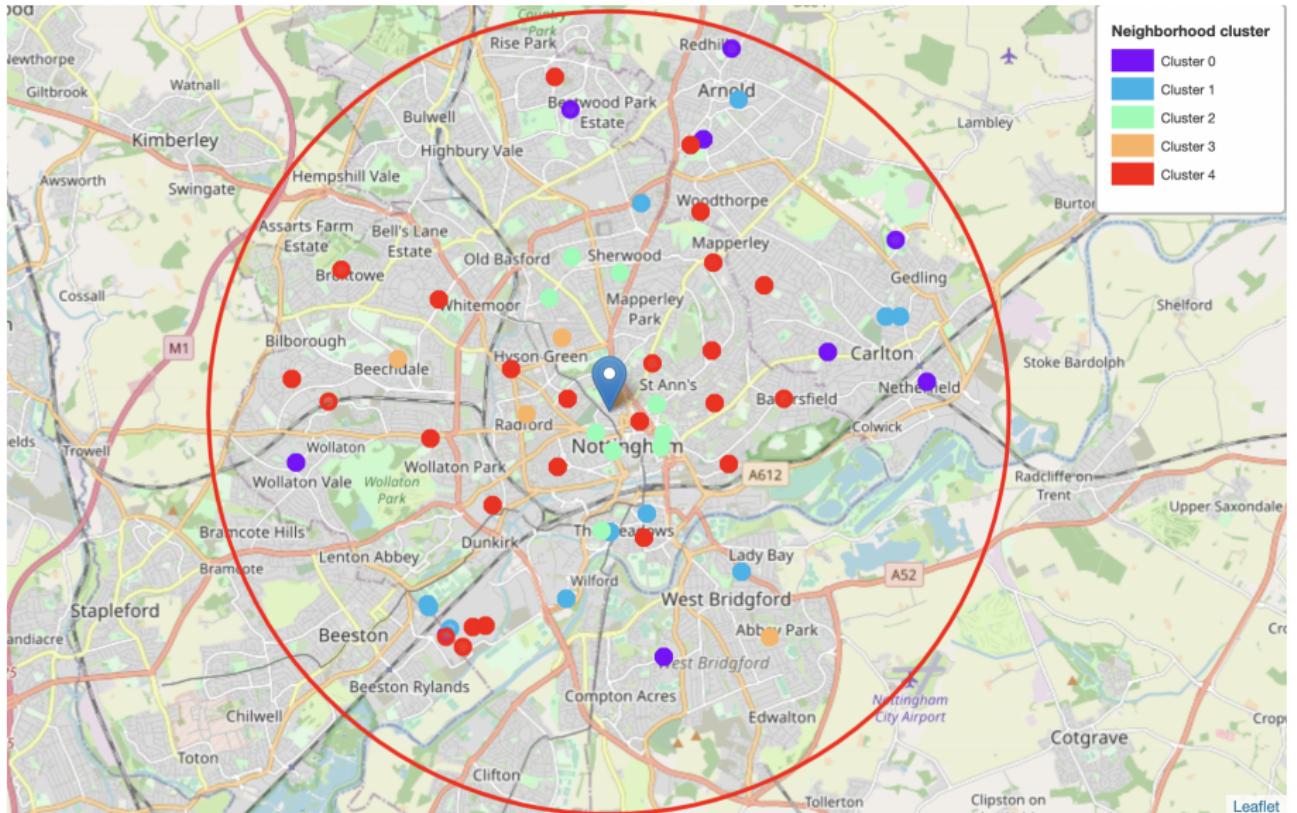
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Cluster analysis

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

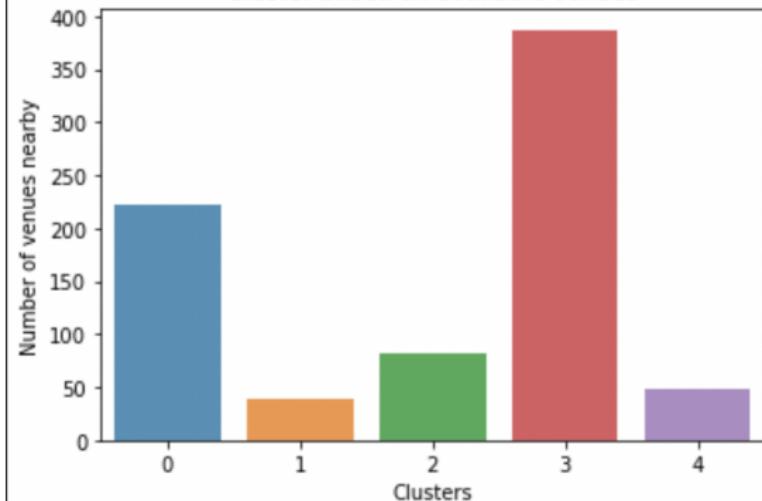


Cluster visualisation



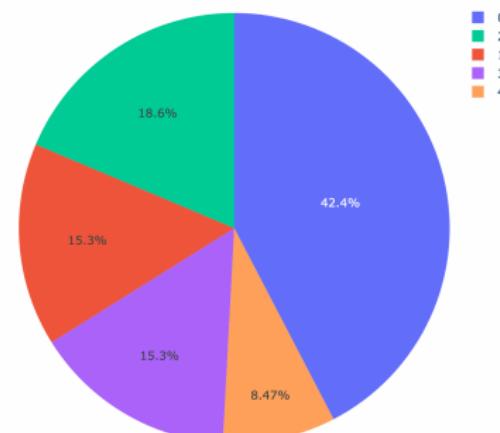
Clusters 1 and 3 offer best facilities of amenities.

Cluster based on available venues



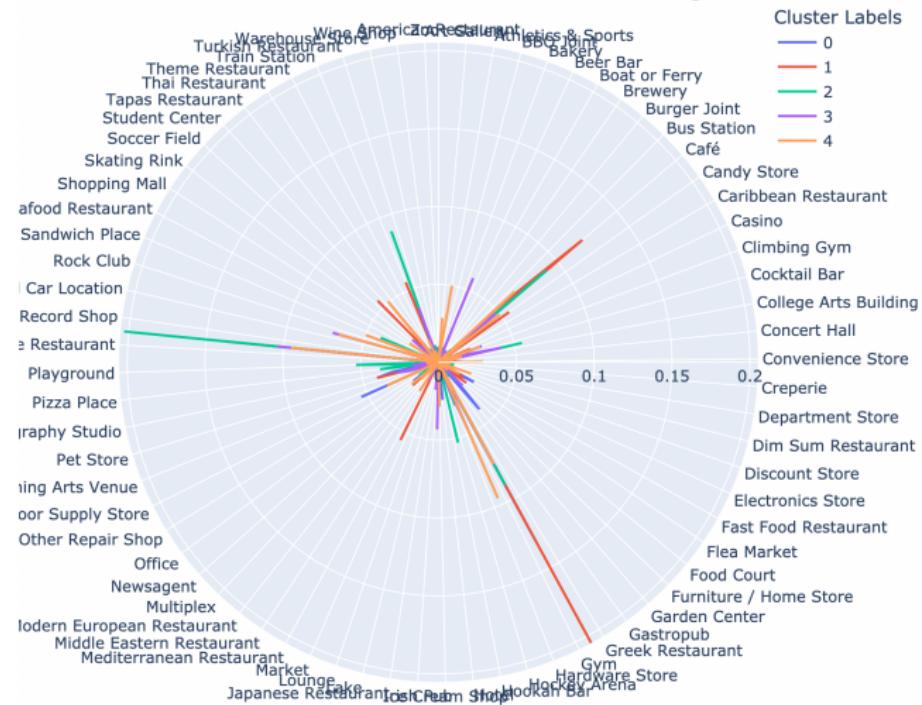
Number of neighborhoods in each cluster

Neighborhoods in each cluster



Visualisation of high dimensional data

Number of dimensions for clustering - 144



Best areas that provide maximum connectivity and safety

| Area codes in the best two clusters | |
|---|--|
| Cluster 0 | Cluster 3 |
| <code>['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']</code> | <code>['NG1 1' 'NG1 9' 'NG1 5' 'NG1 6' 'NG7 7' 'NG3 1' 'NG2 1' 'NG5 2' 'NG5 1']</code> |

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.
 - Reduce dimensionality(PCA) and then cluster.

Thank You