IBM COURSERA CAPSTONE PROJECT

RENT PROPERTIES ANALYSIS IN ROTTERDAM, THE NETHERLANDS

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BUSINESS PROBLEM

- Rotterdam is the 2nd largest city in the Netherlands. It is a major logistic and economic center and Europe's largest seaport.

- Rooms, houses, apartments in the Rotterdam are growing and very competitive. Hence, it is very difficult for new players who want to do their business in properties due to many offers are on the market.

AIMS OF THE STUDY

- Analyze the rented properties in the Rotterdam

- How many groups of rented properties?

- What are the main features that tenants are looking for?

DATA

- Properties data in the Rotterdam
  - Source: Kaggle, https://www.kaggle.com/juangesino/netherlands-rent-properties

- Close-by venues around the properties area
  - Foursquare API

PROPERTIES DATA

- Main selected features are size of the properties, furnished/unfurnished/uncarpeted, internet, room capacity and rental price.
  - Column 'furnish' ==> Unfurnished(0), Furnished(1), Uncarpeted(2)
  - Column 'internet' ==> No(0), Yes(1), Unknown(2)

	id	areaSqm	furnish	internet	matchCapacity	rent	latitude	longitude	postalCode
0	5d2b113b43cbfd7c77a999c4	17	1	1	1	857	51.921123	4.505328	3063ER
1	5d2b113c43cbfd7c77a99a0d	25	1	1	4	600	51.893195	4.516478	3074WL
2	5d2b115d43cbfd7c77a9a588	29	1	2	1	530	51.905459	4.453957	3024TX
3	5d2b11b343cbfd7c77a9c6e4	22	0	1	1	350	51.890358	4.475083	3083GA
4	5d2b11b443cbfd7c77a9c72e	13	1	1	1	699	51.924588	4.486010	3011KM

FOURSQUARE DATA

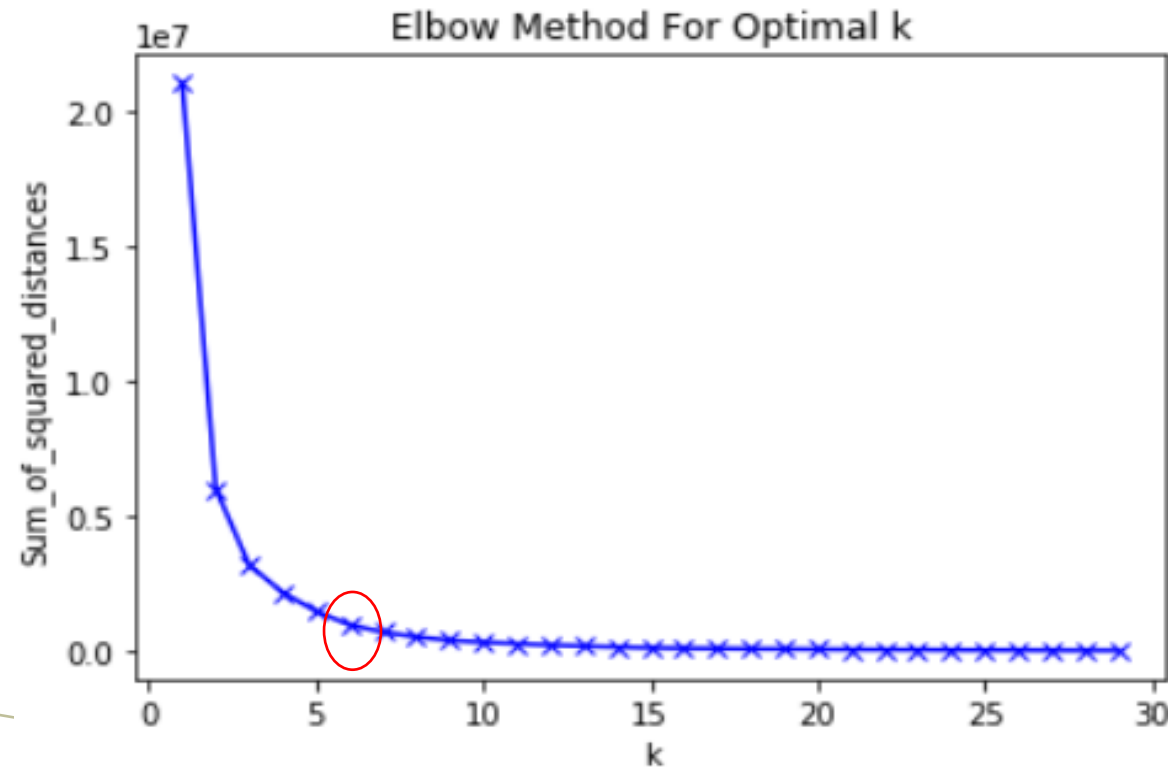- Each property has different venues nearby. With Foursquare feature, venue categories have been tagged.

	id	id Latitude	id Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	5d2b113b43cbfd7c77a999c4	51.921123	4.505328	The Student Hotel Rotterdam	51.921319	4.505519	Hotel
1	5d2b113b43cbfd7c77a999c4	51.921123	4.505328	Aloha	51.919768	4.500730	Restaurant
2	5d2b113b43cbfd7c77a999c4	51.921123	4.505328	De Hemel op Aarde	51.922789	4.500983	Tapas Restaurant
3	5d2b113b43cbfd7c77a999c4	51.921123	4.505328	Bodymentors	51.921896	4.501067	Gym
4	5d2b113b43cbfd7c77a999c4	51.921123	4.505328	Tropicana	51.919768	4.501717	Pool

METHODOLOGY

- To find similar properties in Rotterdam, we used K-means clustering to determine and segment them into the same cluster.

- We used the properties data together with common venues nearby from Foursquare API as an input of the clustering.
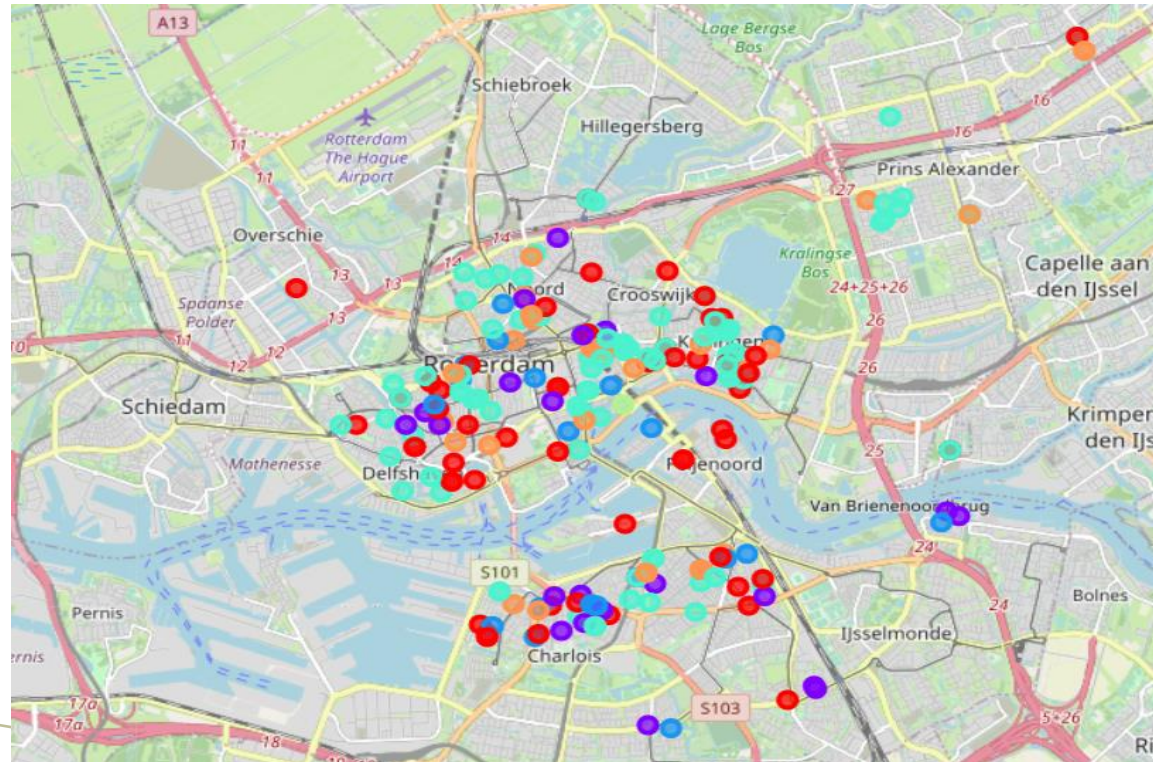
METHODOLOGY

- Define the number of clusters (K) by using elbow curve to identify the most suitable number of K, here, we select K = 6.

RESULT

- The properties in Rotterdam can be classified into 6 groups.

- 6 groups are ranked by the number of properties in that cluster.

RESULT

- 6 clusters ranked and summarized as below

  1. **Cluster 3** (90 properties):
     - Furnished room for 1 person with internet, low rental price (450-600 euros/month) and have restaurants, drug store, supermarkets, and coffee shop nearby.
  2. **Cluster 0** (56 properties):
     - Furnished/unfurnished room for 1 person with very low rental price (250-450 euros/month) and have restaurants, drug store, supermarkets, and coffee shop nearby.
  3. **Cluster 5** (36 properties):
     - Furnished room for 1-2 persons with internet, medium rental price (650-800 euros/month) and have restaurants, supermarkets, and coffee shops nearby.

RESULT

- 6 clusters ranked and summarized as below

4. **Cluster 1** (25 properties):
   - Unfurnished room for 1-2 persons (>50 m2) with medium to high rental price and have restaurants, supermarkets, drug store and coffee shops nearby.

5. **Cluster 2** (21 properties):
   - Furnished/unfurnished room for 4 persons (>45 m2) with high rental price (>1,100 euros/month) and have restaurants and public transportation nearby.

6. **Cluster 4** (2 properties):
   - Very high rental price (1,950 euros/month) and big size (>120m2)

CONCLUSION

• All 6 clusters were summarized and analyzed based on the prominent similar information within the same cluster.

• Most of rented properties are for 1 person with low rental price (450-600 euros/month) following by very low rental price (250-450 euros/month). For 1-2 persons rooms, the price is in medium to high range which is mixed between furnished and unfurnished. Lastly, the least popular properties have very high rental price and large living area.

• However, we could see that the features having big influence are the rental price, room capacity and size, respectively. Meanwhile, the venues nearby are similar across clusters. Most commons are restaurants, supermarket, drug store.

• As a result, housing companies, private rooms/apartment/house owners can use this information for their properties improvement, price adjustment, advertising, and suitable locations with nice venues.