Coursera Capstone

Identifying real estate opportunities in Madrid, Spain

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Business Problem

- Job market, environmental and health conditions are changing the game of real estate
- The objective of this capstone is to find underpriced neighborhoods in Madrid
- Which areas could show an opportunity with the latest global changes?

Data

- Data required:
  - List of neighborhoods in Madrid. This defines the scope of this project which is confined to the city of Madrid, the capital city of the country of Spain
  - Latitude and longitude coordinates of those neighborhoods. This is required in order to plot the map and also to get the venue data
  - Venue data for the different neighborhoods, in order to see the similitude of the different areas
  - Housing prices for the different neighborhoods. We will use the price per square meter to compare economic situation of the real state sector in the different areas
  - Neighborhoods geometry and position, to be able to divide the city in its different parts

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Data

- Source:
  - Wikipedia, https://es.wikipedia.org/wiki/Anexo:Barrios_administrativos_de_Madrid
  - Geocoder package for latitude and longitude coordinates
  - Foursquare API for venue data
  - Idealista, https://www.idealista.com/sala-de-prensa/informes-precio-vivienda/venta/madrid-comunidad/madrid-provincia/madrid/
  - Madrid statistics web, https://datos.madrid.es

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Methodology

- Web scraping Wikipedia page for neighborhoods list
- Web scraping Idealista page for neighborhoods prices
- Web scraping Madrid statistics web page for neighborhoods geometries
- Get latitude and longitude coordinates using Geocoder
- Use Foursquare API to get venue data
- Group data by neighborhood and get the frequency for each venue type
- Cluster data by k-means algorithm and elbow method
- Visualize neighborhoods and prices in Folium
- Analyze data to obtain market opportunities

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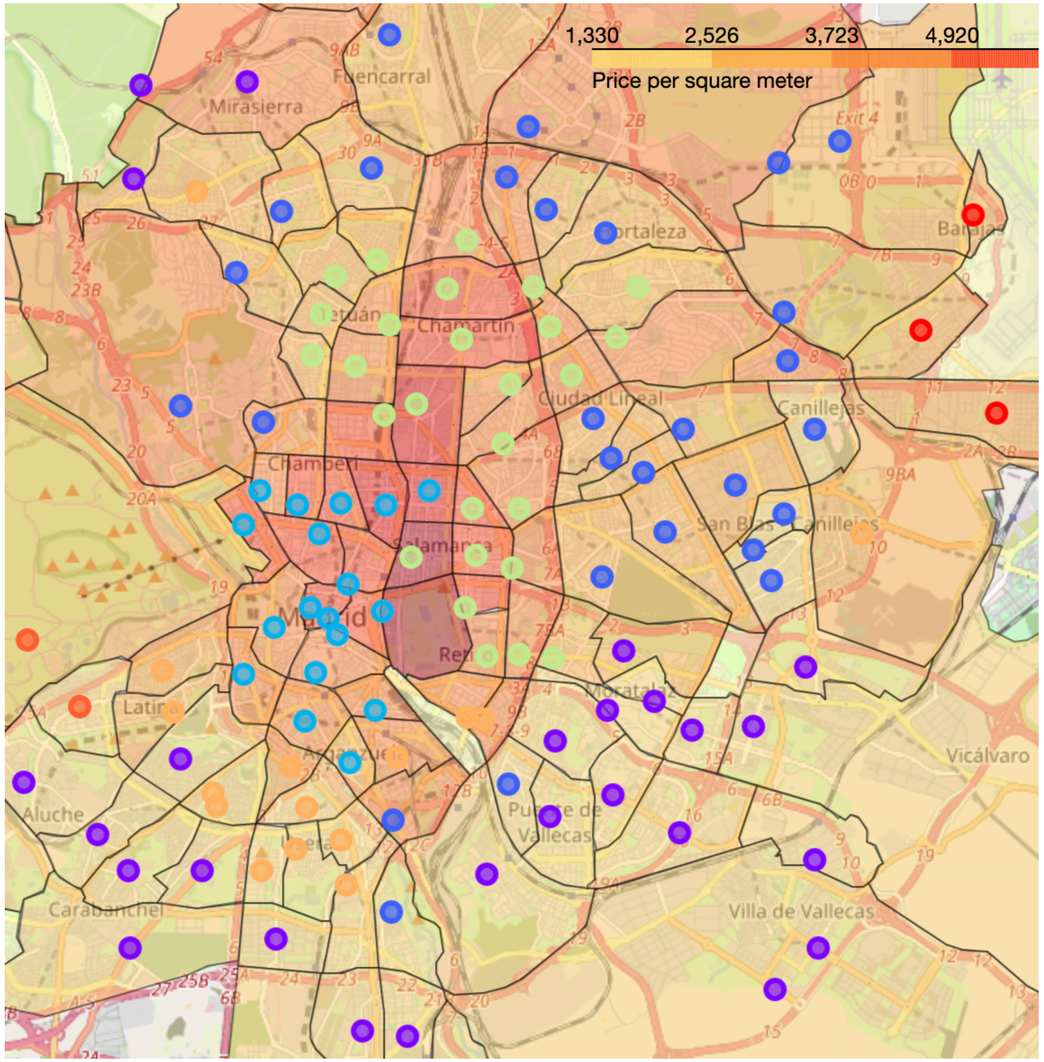
Results

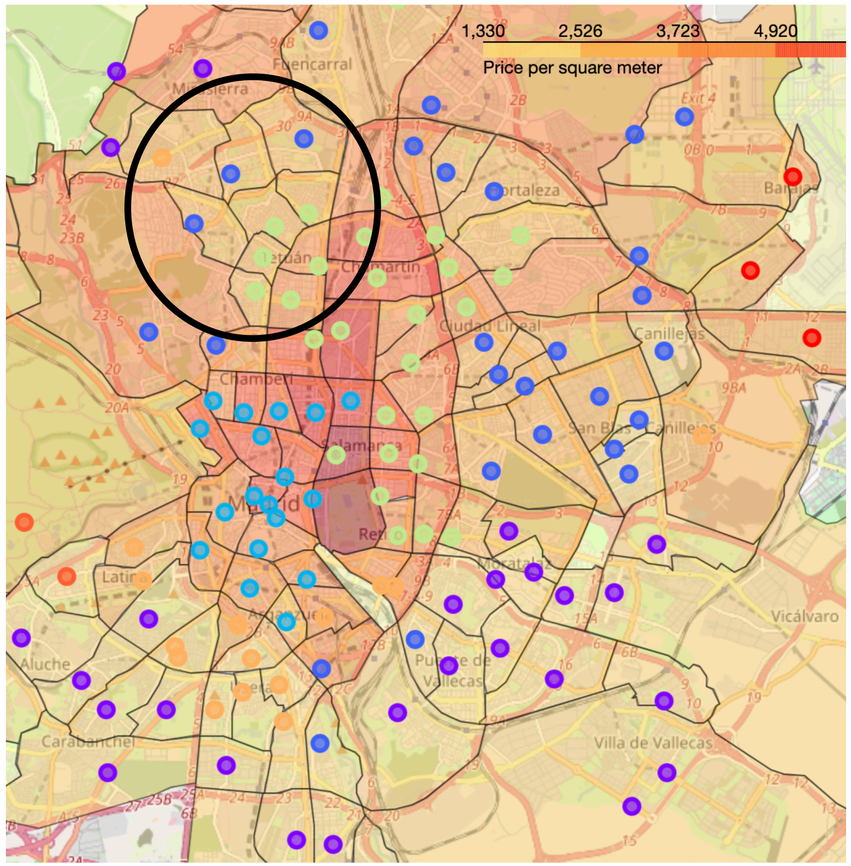
- Elbow method determined Kc=9

- Cluster 0: ‘Airport’ neighborhoods (Red in the map)
- Cluster 1: Outdoor South neighborhoods. Residential areas with a lot of grocery stores, supermarkets and bars. (Purple in the map)
- Cluster 2: Outdoor North neighborhoods. Residential areas with supermarkets, Spanish restaurants and green areas (Dark blue in the map)
- Cluster 3: Center neighborhoods. Area with a lot of hotels, restaurants and squares. (Light blue in the map)
- Cluster 4: Only one neighborhood: El Cañaveral - Los Berrocales. The algorithm made the cluster considering a lot of venues related to tolls and road businesses. (Turquoise in the map)
- Cluster 5: Only one neighborhood: Casco Histórico de Vicálvaro. The algorithm made the cluster considering a lot of venues related to tolls and the presence of the zoo. (Tourquoise-green in the map)
- Cluster 6: North neighborhoods. Area with a lot of different cuisine restaurants, cafes, and boutiques. (Light green in the map)
- Cluster 7: South neighborhoods: Area with a lot of parks, grocery stores and Spanish restaurants. (Orange in the map)
- Cluster 8: ‘Theme park neighborhoods’. Main venues related to the theme park. (Dark orange in the map)



Results

- Main opportunities found in the northwest area. Neighborhoods with prices lower than the districts surrounding them:



	Neighborhood	Cluster Labels	Price	Max	Max_period	Year change	Cluster mean price	Price/Max
2	Tres Olivos - Valverde	2	2698	2895	dic 2010	0.035	3103.000000	0.931952
3	Apóstol Santiago	2	2890	2963	mar 2020	0.008	3103.000000	0.975363
4	Pinar del Rey	2	2863	3238	nov 2010	-0.047	3103.000000	0.884188
5	Valdezarza	2	3090	3448	mar 2019	-0.075	3103.000000	0.896172
6	Las Tablas	6	4192	4324	jul 2019	0.006	4478.103448	0.969473
7	Canillas	6	3242	3692	nov 2009	0.005	4478.103448	0.878115
8	Bellas Vistas	6	3513	3688	may 2019	-0.024	4478.103448	0.952549
9	Berruguete	6	3253	3330	nov 2009	0.022	4478.103448	0.976877
10	Valdeacederas	6	3252	3541	oct 2008	0.027	4478.103448	0.918385
11	Ventilla-Almenara	6	3383	3494	feb 2020	-0.014	4478.103448	0.968231

Discussion

- Clusters clearly divides Madrid in 4 main areas: North/South and center/ surroundings.
- Opportunities found in the northwest area of Madrid
- Key metrics identified to select best neighborhood depending on the investors needs:
    - Max_period
    - Year change

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Conclusion

- Analysis of the city was performed showing the different areas in terms of venues types
- 10 Neighborhoods found subject of investment
- Future line of research: Input more variables in the model and properties data to find the best market opportunity.

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Thank you


thank you
danke
謝謝
ngiyabonga
рахмат
teşekkür ederim
спасибо
gracias
tapadh leat
Баярлалаа
dank je
misaotra
matondo
paldies
grazzi
mahalo
faafetai lava
vinaka
спасибі
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barka
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kia ora
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감사합니다
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