



Madrid Investment Options



Background

Madrid is the Capital of Spain, and the second largest city with 3.3 million inhabitants and the third largest GDP in the European Union.

The economic development brings great incomes for its inhabitants, also the gastronomy, historical places, museums and modern architecture made Madrid a great place to live and an amazing tourist destination.

For all the previous arguments, Madrid has become attractive for new investors around the globe who are looking for a great income for their business



CREDIT: RUDYBALASKO/RUDYBALASKO

The Problem

A group of investor is looking for a new opportunities to increase their business in Madrid.

This report explored house markets and the commercial offer in Madrid Neighborhoods, comparing Net Income per Capita, House Price evolution and Commercial life in the Madrid Neighborhoods, to help stakeholders with new insights to decide which and where could be a better option for their investments.



Credit: <https://goldenvisasconsultancy.com/>

Data Description

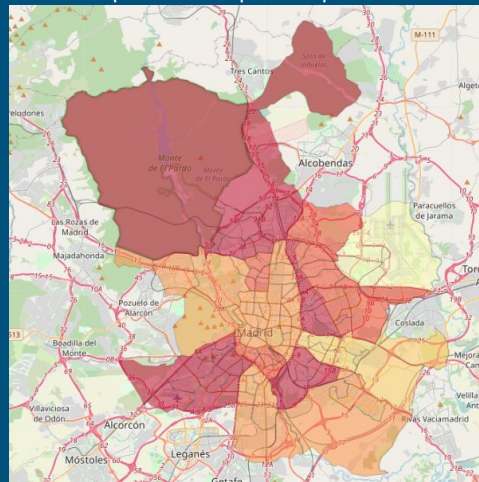
The following data was considered to solve the problem:

1. Madrid 's District and Neighborhood table scrapped from wikipedia [link](#).
2. Demography and economic data from [the data bank of Madrid City Hall](#) was merged with the table got it above.
3. Using demography and economics data from Madrid's table and the geojson read from the [open data of Community of Madrid](#) to make all Choropleth maps.
4. Venues and venues categories were merged with Madrid's Table to make all analysis and suggests, this action was completed in two steps:
 - The coordinates of each Neighborhood of Madrid were extracted from Google Geocoding API.
 - Foursquare API were used to get all venues and venues categories from Madrid Neighborhoods.

Madrid table example

	District Name	District Population		District Name	District Population
0	Centro	131928	11	Usera	134791
1	Arganzuela	151965	12	Puente de Vallecas	227595
2	Retiro	118516	13	Moratalaz	94197
3	Salamanca	143800	14	Ciudad Lineal	212529
4	Chamartín	143424	15	Hortaleza	180462
5	Tetuán	153789	16	Villaverde	142608
6	Chamberí	137401	17	Villa de Vallecas	104421
7	Fuencarral-El Pardo	238756	18	Vicálvaro	70051
8	Moncloa-Aravaca	116903	19	San Blas-Canillejas	154357
9	Latina	233808	20	Barajas	46876
10	Carabanchel	243998			

Madrid Population Choropleth map



Methodology

1. First of all was read the table with Madrid District and Neighborhoods [Wikipedia link](#) using Requests Library to get and to scrape html responses.
2. The Madrid Table was merged with the data Population, Net Income by Home, House Price 2019 and 2018 previously downloaded from the [data bank of Madrid City Hall](#) and added to [GitHub Repository](#). All these was done using Pandas Library

Madrid table first 10 rows

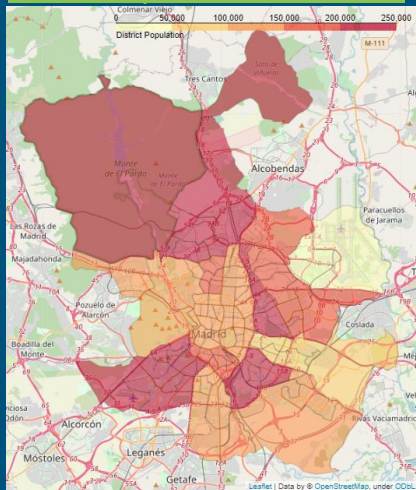
madrid.head(10)						
Out[37]:						
	District Name	Neighborhood	District Population	Net Income by Home	House Price 2019 €/m2	House Price 2018 €/m2
0	Centro	Palacio	131928	34.676	4852.0	4873.0
1	Centro	Embajadores	131928	26.000	4479.0	4239.0
2	Centro	Cortes	131928	34.953	5272.0	5106.0
3	Centro	Justicia	131928	40.315	5893.0	5989.0
4	Centro	Universidad	131928	30.702	5282.0	5068.0
5	Centro	Sol	131928	30.936	5110.0	5263.0
6	Arganzuela	Imperial	151965	41.951	3922.0	3896.0
7	Arganzuela	Las Acacias	151965	44.669	4188.0	4046.0
8	Arganzuela	La Chopera	151965	31.934	3625.0	3727.0
9	Arganzuela	Legazpi	151965	48.935	4394.0	4263.0

Methodology

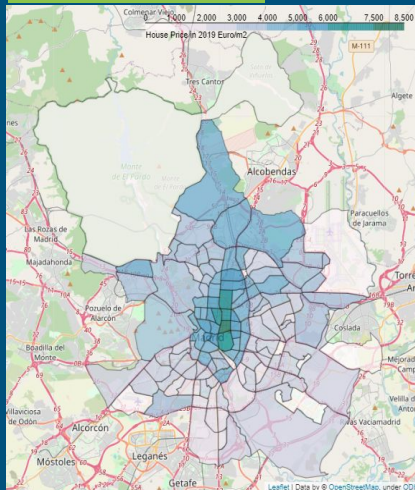
3. The [.json map](#) was downloaded from the open data of Community of Madrid Connect using Requests library, then the data was wrangled to be used to make the following series of Choropleths Maps combined with the previous slide table.

Note: To see a better all maps with resolution and navigate through the map, go to link attached to the name, download the file and open it with your internet browser.

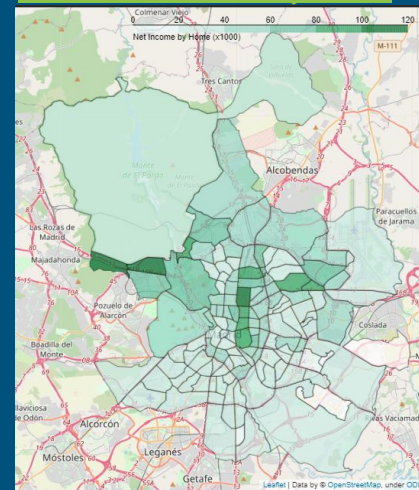
Madrid Population Distribution



Madrid House Price



Madrid Net Income by Home



Methodology

4. Venues and Venues Category were got from Foursquare API in two steps:
 - 4.1. Neighborhoods coordinates were extracted from Google Geocoding API and added to Madrid Table.

Madrid table first 10 rows

```
madrid.head(10)
```

Out[58]:

	District Name	Neighborhood	District Population	Net Income by Home	House Price 2019 €/m2	House Price 2018 €/m2	House Price Growth %	Neighborhood Latitude	Neighborhood Longitude
0	Centro	Palacio	131928	34.676	4852.0	4873.0	-0.43	40.416339	-3.714318
1	Centro	Embajadores	131928	26.000	4479.0	4239.0	5.66	40.408129	-3.707739
2	Centro	Cortes	131928	34.953	5272.0	5106.0	3.25	40.414221	-3.699941
3	Centro	Justicia	131928	40.315	5893.0	5989.0	-1.60	40.424531	-3.699293
4	Centro	Universidad	131928	30.702	5282.0	5068.0	4.22	40.423372	-3.707792
5	Centro	Sol	131928	30.936	5110.0	5263.0	-2.91	40.416663	-3.704169
6	Arganzuela	Imperial	151965	41.951	3922.0	3896.0	0.67	40.406845	-3.720088
7	Arganzuela	Las Acacias	151965	44.669	4188.0	4046.0	3.51	40.403926	-3.706549
8	Arganzuela	La Chopera	151965	31.934	3625.0	3727.0	-2.74	40.394836	-3.699599
9	Arganzuela	Legazpi	151965	48.935	4394.0	4263.0	3.07	40.389234	-3.686412

Methodology

4. Venues and Venues Category were got from Foursquare API in two steps:
 - 4.1.1. Venues and Venues Categories from each Neighborhood were consulted through Foursquare API, using the coordinates from previous step and a 700 mts radius. 2

Madrid Venues and Venues Categories by Neighborhood

```
madrid_venues.groupby(['District Name', 'Neighborhood']).head()
```

Out[59]:

	District Name	Neighborhood	Latitude	Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Centro	Palacio	40.416339	-3.714318	Palacio Real de Madrid	40.417940	-3.714259	Palace
1	Centro	Palacio	40.416339	-3.714318	Cervecería La Mayor	40.415218	-3.712194	Beer Bar
2	Centro	Palacio	40.416339	-3.714318	Santa Iglesia Catedral de Santa María la Real ...	40.415767	-3.714516	Church
3	Centro	Palacio	40.416339	-3.714318	Plaza de La Almudena	40.416320	-3.713777	Plaza
4	Centro	Palacio	40.416339	-3.714318	Plaza de Oriente	40.418326	-3.712196	Plaza
96	Centro	Embajadores	40.408129	-3.707739	El Capricho Extremeño	40.407090	-3.708261	Tapas Restaurant
97	Centro	Embajadores	40.408129	-3.707739	La Tienda de la Cerveza	40.410546	-3.708128	Food & Drink Shop
98	Centro	Embajadores	40.408129	-3.707739	Ruda Café	40.410486	-3.708000	Coffee Shop
99	Centro	Embajadores	40.408129	-3.707739	Galerías Piquer	40.407792	-3.706823	Art Gallery
100	Centro	Embajadores	40.408129	-3.707739	Nina Pasta Bar	40.409508	-3.708836	Italian Restaurant

Methodology

- 10 Most Common Venues Categories table was created from the previous dataframe, it was able to see the commercial offer in Madrid.

10 Most Common Madrid Venues Categories by Neighborhood

neighborhoods_venues_sorted												
Out[38]:												
	District Name	Neighborhoods	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Arganzuela	Atocha	Spanish Restaurant	Restaurant	Bakery	Hotel	Museum	Café	Bar	Italian Restaurant	Brewery	Grocery Store
1	Arganzuela	Delicias	Spanish Restaurant	Tapas Restaurant	Bakery	Restaurant	Gym / Fitness Center	Beer Garden	Grocery Store	Farmers Market	Plaza	Ice Cream Shop
2	Arganzuela	Imperial	Spanish Restaurant	Park	Gym / Fitness Center	Grocery Store	Hotel	Pizza Place	Tapas Restaurant	Brewery	Racetrack	Beer Garden
3	Arganzuela	La Chopera	Spanish Restaurant	Tapas Restaurant	Coffee Shop	Grocery Store	Bakery	Restaurant	Bar	Park	Mediterranean Restaurant	Soccer Field
4	Arganzuela	Las Acacias	Spanish Restaurant	Tapas Restaurant	Restaurant	Bar	Pizza Place	Art Gallery	Theater	Plaza	Market	Indie Theater

Methodology

5. The K Means Models was run to group the neighborhoods in cluster regarding its common venues.

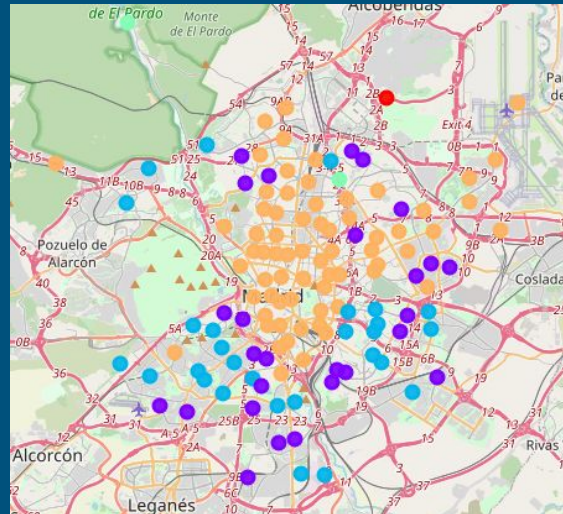
madrid_merged															
Out[54]:															
	District Name	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue	Cluster Labels
0	Centro	Palacio	40.416339	-3.714318	Tapas Restaurant	Spanish Restaurant	Plaza	Bar	Hotel	Wine Bar	Ice Cream Shop	Historic Site	Restaurant	French Restaurant	4
1	Centro	Embajadores	40.408129	-3.707739	Tapas Restaurant	Bar	Hotel	Spanish Restaurant	Vegetarian / Vegan Restaurant	Plaza	Restaurant	Theater	Art Gallery	Café	4
2	Centro	Cortes	40.414221	-3.699941	Hotel	Bar	Plaza	Café	Restaurant	Theater	Tapas Restaurant	Hostel	Mediterranean Restaurant	Spanish Restaurant	4
3	Centro	Justicia	40.424531	-3.699293	Spanish Restaurant	Restaurant	Hotel	Café	Plaza	Bookstore	Cosmetics Shop	Vegetarian / Vegan Restaurant	Deli / Bodega	Bar	4
4	Centro	Universidad	40.423372	-3.707792	Hotel	Plaza	Bookstore	Café	Tapas Restaurant	Cosmetics Shop	Bar	Spanish Restaurant	Breakfast Spot	Mediterranean Restaurant	4

Methodology

6. The Clusters Map was made with the previous table.

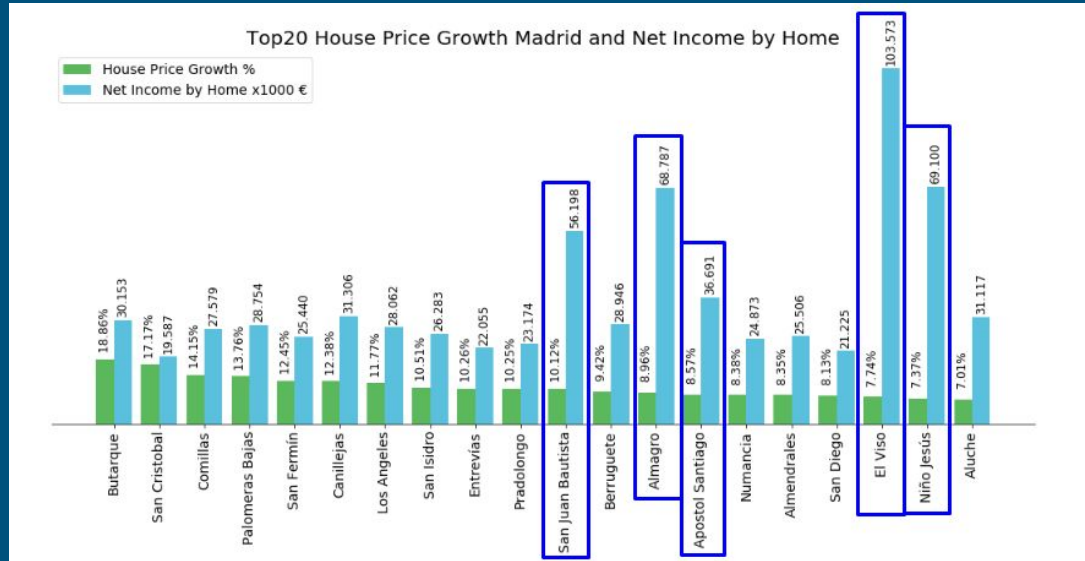
Note: To see a better all maps with resolution and navigate through the map, go to link attached to the name, download the file and open it with your internet browser.

Madrid Clusters Map



Results

1. House Price % Growth is the variation between 2018 and 2019 for each Neighborhood, the results were sorted in a descending way. Then using the Net Home Income 5 neighborhoods are highlighted to be the best investment options for two reasons:
 - a. House Markets is growing
 - b. People who live in there have money to spend or invest in real estate opportunities



Results

2. The 5 highlighted Neighborhoods have a similar commercial offer, their principals venues are restaurant related business.

Top 5 Venues Categories of each Neighborhood to study

	District Name	Neighborhood	Venue Category	N° Venues		District Name	Neighborhood	Venue Category	N° Venues
0	Chamartín	El Viso	Spanish Restaurant	13	15	Hortaleza	Apostol Santiago	Spanish Restaurant	2
1	Chamartín	El Viso	Burger Joint	6	16	Hortaleza	Apostol Santiago	Bakery	1
2	Chamartín	El Viso	Plaza	5	17	Hortaleza	Apostol Santiago	Diner	1
3	Chamartín	El Viso	Soccer Stadium	5	18	Hortaleza	Apostol Santiago	Food	1
4	Chamartín	El Viso	Coffee Shop	4	19	Hortaleza	Apostol Santiago	Grocery Store	1
5	Chamberí	Almagro	Restaurant	14	20	Retiro	Niño Jesús	Spanish Restaurant	9
6	Chamberí	Almagro	Spanish Restaurant	9	21	Retiro	Niño Jesús	Bar	5
7	Chamberí	Almagro	Mediterranean Restaurant	5	22	Retiro	Niño Jesús	Grocery Store	3
8	Chamberí	Almagro	Plaza	5	23	Retiro	Niño Jesús	Supermarket	3
9	Chamberí	Almagro	Tapas Restaurant	5	24	Retiro	Niño Jesús	Art Gallery	2
10	Ciudad Lineal	San Juan Bautista	Seafood Restaurant	4					
11	Ciudad Lineal	San Juan Bautista	Spanish Restaurant	4					
12	Ciudad Lineal	San Juan Bautista	Bar	3					
13	Ciudad Lineal	San Juan Bautista	Park	3					
14	Ciudad Lineal	San Juan Bautista	Asian Restaurant	2					

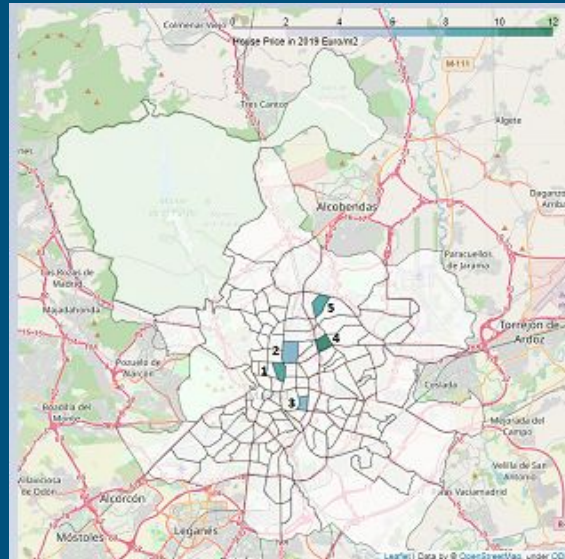
Discussion

Almagro, El Viso and Niño Jesús have the close location to city center, which is ideal thinking in a real estate investment or a commercial venture like a restaurant o food related business.

Top 5 Neighborhood location

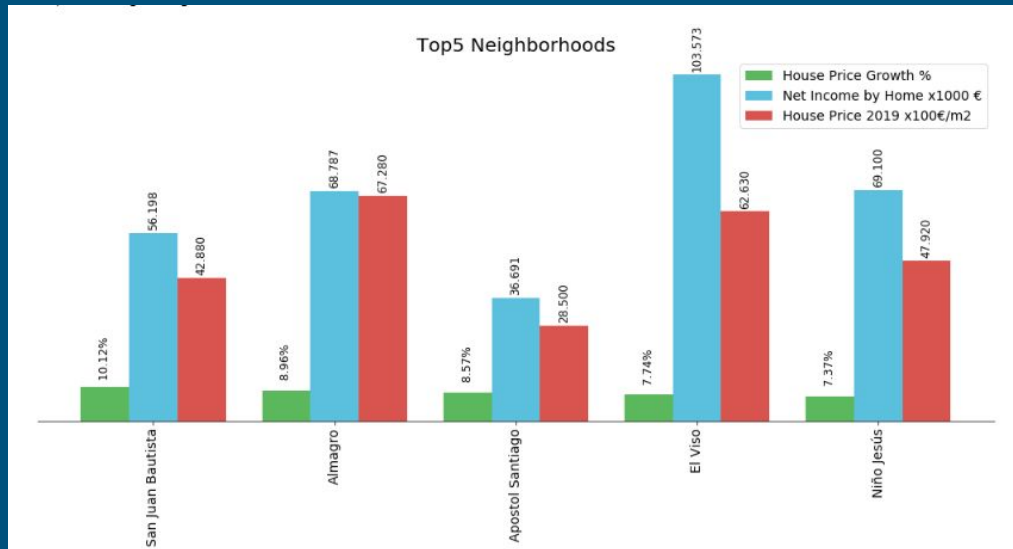
Legend

1. Almagro
2. El Viso
3. Niño Jesús
4. San Juan Bautista
5. Apostol Santiago



Discussion

The Top 5 Neighborhoods of Madrid brings another great characteristic that is versatility of investment because can be adapted to many budgets, Luxury places like Almagro or El Viso, or more residencial like Apostol Santiago.



Conclusion

The insights presented in this report, can be used to decide an investment option divided in 4 categories:

- **Luxury apartments:** Almagro, El Viso
- **Restaurant Business:** Almagro, El Viso or Niño Jesús.
- **Residential apartments:** Apostol Santiago, San Juan Bautista.
- **Tourist lodging:** Almagro

The final decision will be related to budget, capital available to invest and kind of business.

