

# Apartment Rentals in Vienna

## Prices & Venues Analysis

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May 8<sup>th</sup>  
2020

**Capstone Project**  
The Battle of  
Neighborhoods

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# The Best Place to Live at the Moment is *Vienna*



*“Maintaining its position in the number one spot for the second year in a row, Vienna provides the perfect blend of adventure, affordability, ease of living, and safety.”*

*“The Austrian capital draws crowds with its Baroque architecture and Danube cruises, but it's just as exciting as a center of what's new in the culinary and art worlds of Europe. And due to a city government that puts a lot of resources behind infrastructure and housing, the cost of living here is far lower than comparable European cities.”*

## **Overall rating: 99.1**

1. Stability: 100
2. Healthcare: 100
3. Culture & Environment: 96.3
4. Education: 100
5. Infrastructure: 100

*According to Economist Intelligence Unit's  
"Global Liveability Report"*

# Apartment Rentals in Vienna Prices & Venues Analysis

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*Since Vienna is the best place to live it will be interesting to analyze apartment rental opportunities*

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For people who are **interested in moving** to Vienna (permanently or temporarily):

- Compare districts by rental price
- Compare districts by area types

For people who **already live** in Vienna:

- Evaluate how the current price there is compared to the average market price
- Identify which districts are similar to theirs but have lower rent prices

# Data Collection & Preparation

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**Apartments for Rentals in Vienna** (*size, number of rooms, address, and price*)

- **BeautifulSoup** to scrap data from a local website with apartment listings [willhaben.at](http://willhaben.at)
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**Coordinates for Districts**

- **geopy** to get location data for all Vienna's districts
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**Information on Most Common Venues**

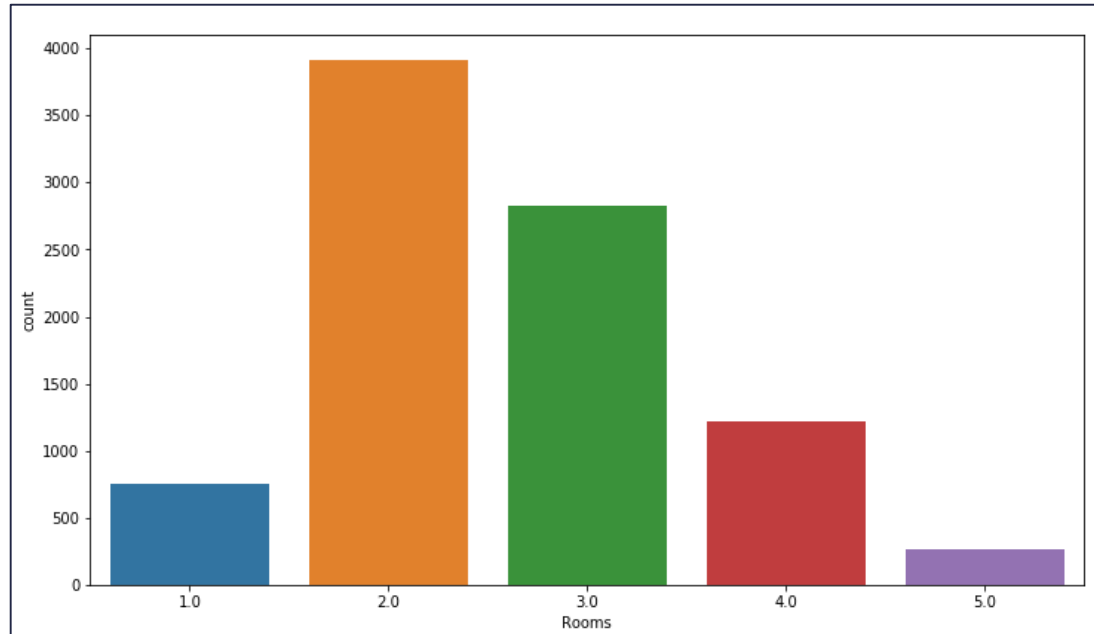
- **Foursquare API** to collect the closest venues (supermarket, restaurant, park, etc.)
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**For Choropleth Map**

- **JSON file** for geo-data for districts in Vienna  
<https://github.com/ginseng666/GeoJSON-TopoJSON-Austria>

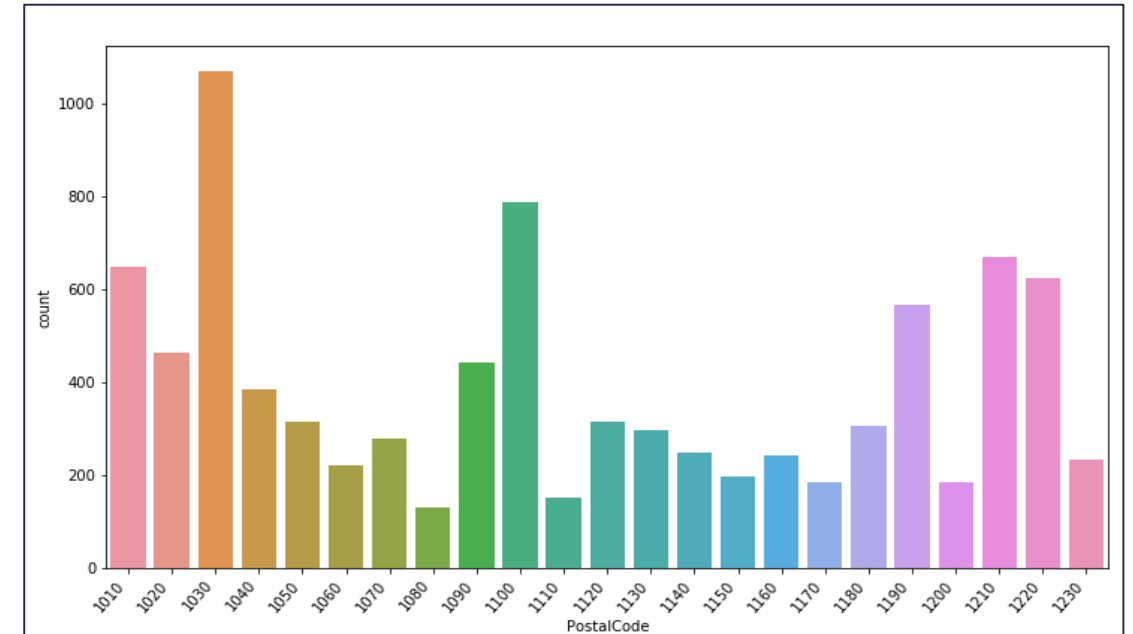
# Frequency of Apartment Listings

Per Number of Rooms



- Listings for 2-room apartments are the most common followed by 3-room apartments
- The least frequent listings are the ones for 5-room apartments

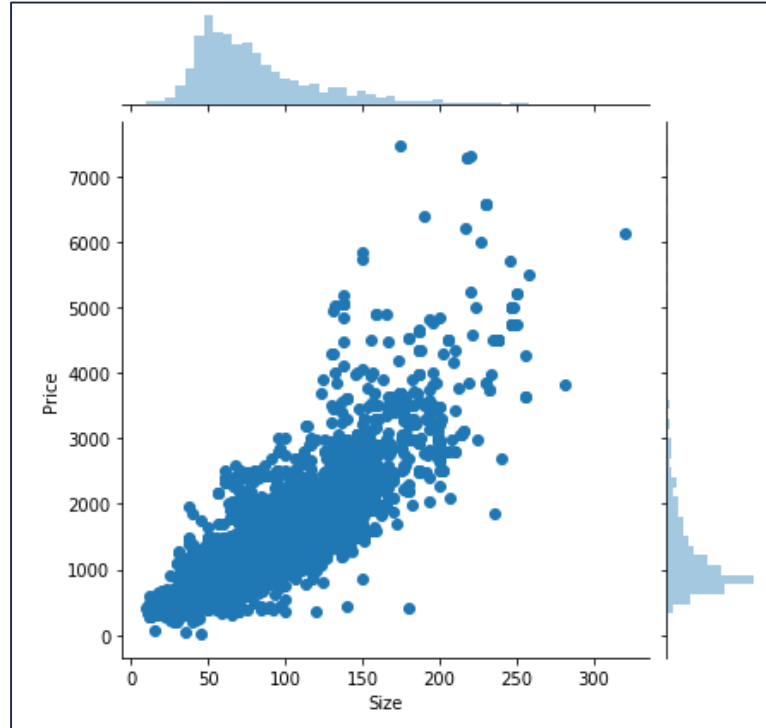
Per Postal Code (district)



- Listings for 1030 (Landstraße) district are the most common followed by 1100 (Favoriten)
- The least frequent listings are for 1080 (Josefstadt) district

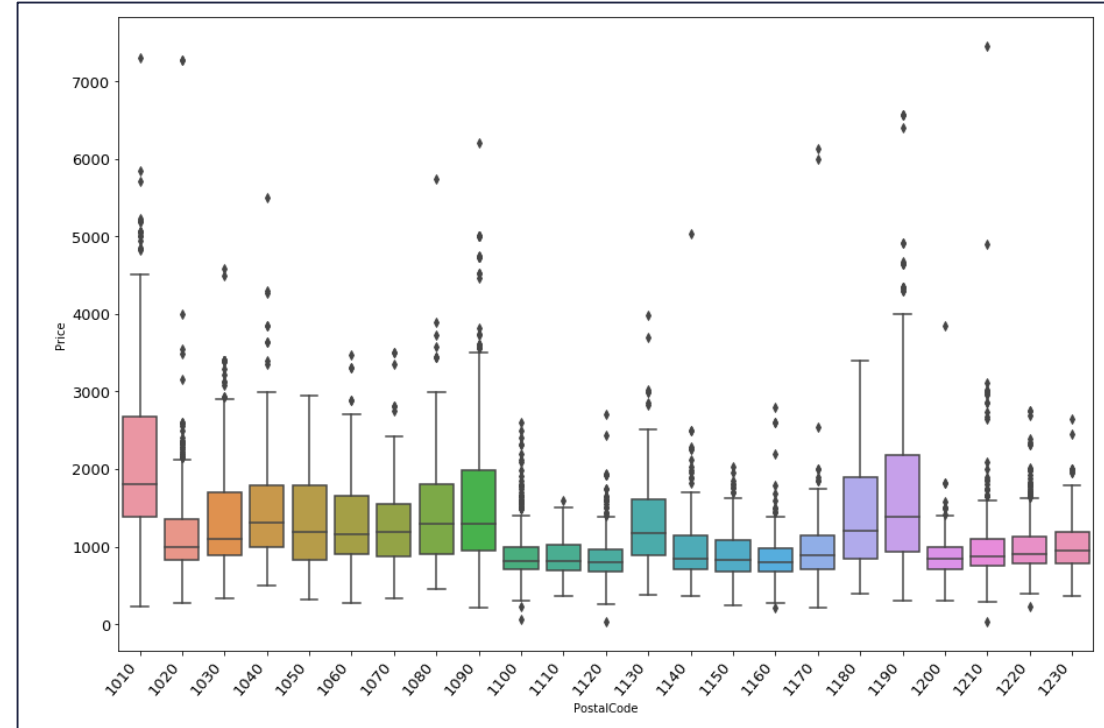
# Apartment Prices Distribution

Price Vs Size



- Relationship between the price and apartment size (m²) based
- 8'964 apartments in the dataset

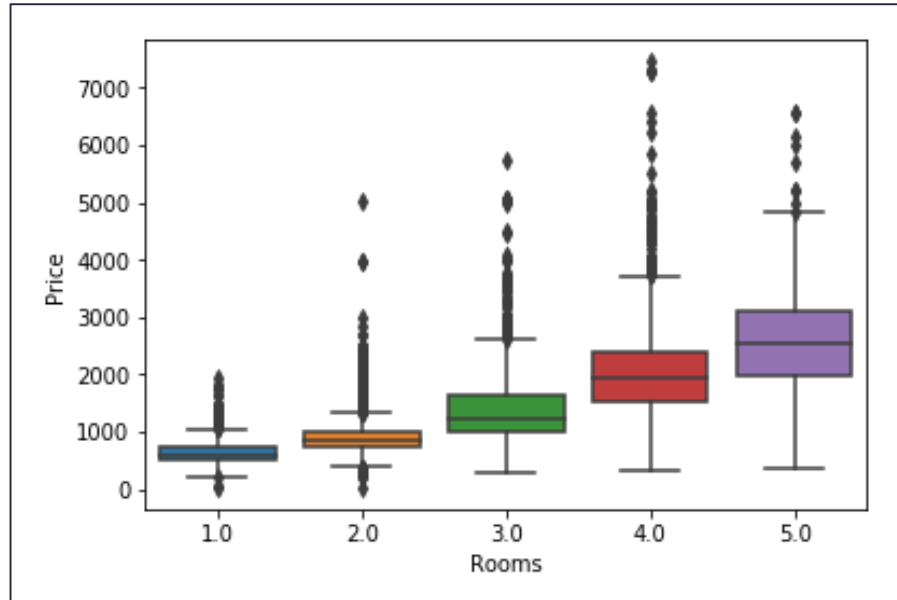
Price Distributions per Districts



- 1010 (Innere Stadt) is the most expensive district followed by 1190 (Döbling) then by 1090 (Alsergrund)
- Lots of outliers for luxurious apartments in the majority of districts

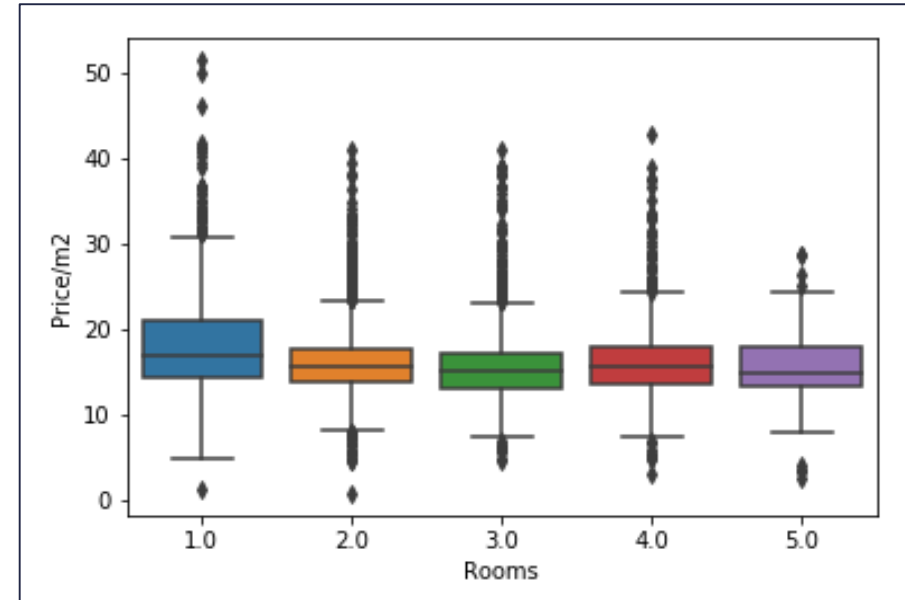
# Absolute & Relative Prices Vs No of Rooms

Absolute Price Vs No of Rooms



- Box plot confirms the intuition – there is a direct proportion between the price and the number of rooms
- Price range for 1-room apartments is very close to 2-room apartments

Price per m2 Vs No of Rooms



- Inverse proportion between the price/m2 and the number of rooms is not as strong as expected
- 1-room apartments are more expensive per m2 than apartments with more rooms

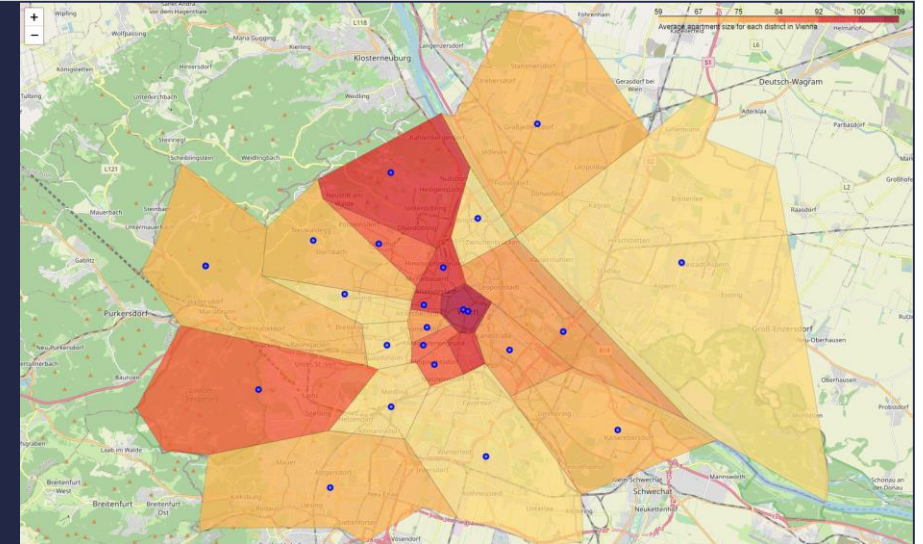


# Visualizing Data on the Map

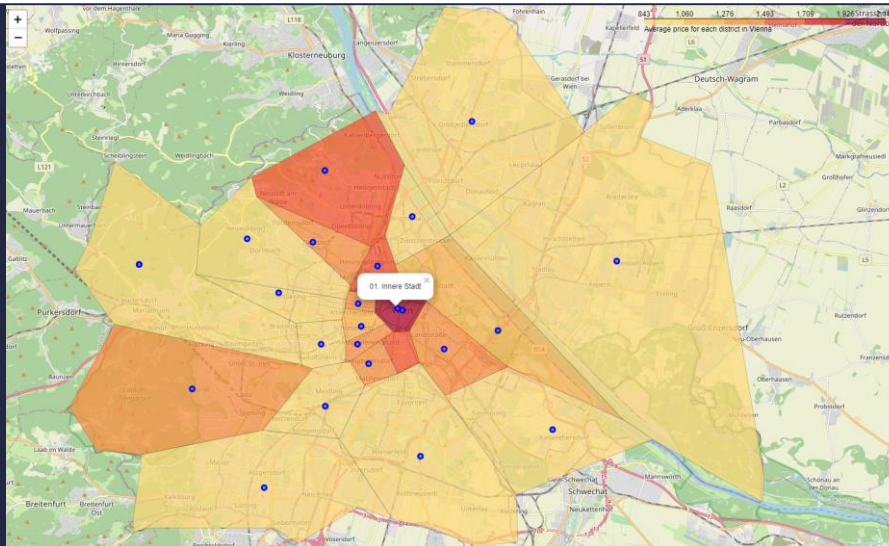
Combining the data about apartments with geo-data per district we can visualize distribution per district for the following metrics:

- Average Absolute price
- Average Relative price (per m2)
- Average Apartment size

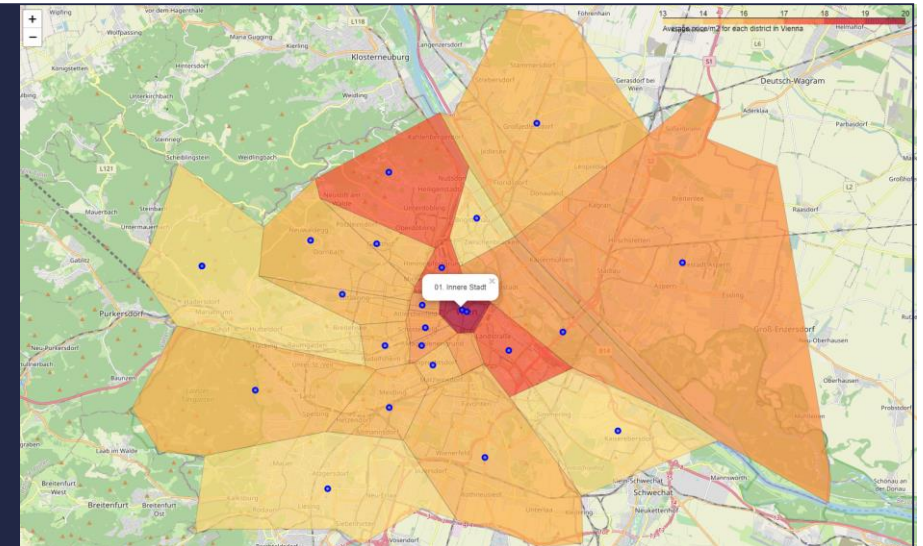
Avg. Size per District



Avg. Price per District



Avg. Price/m2 per District





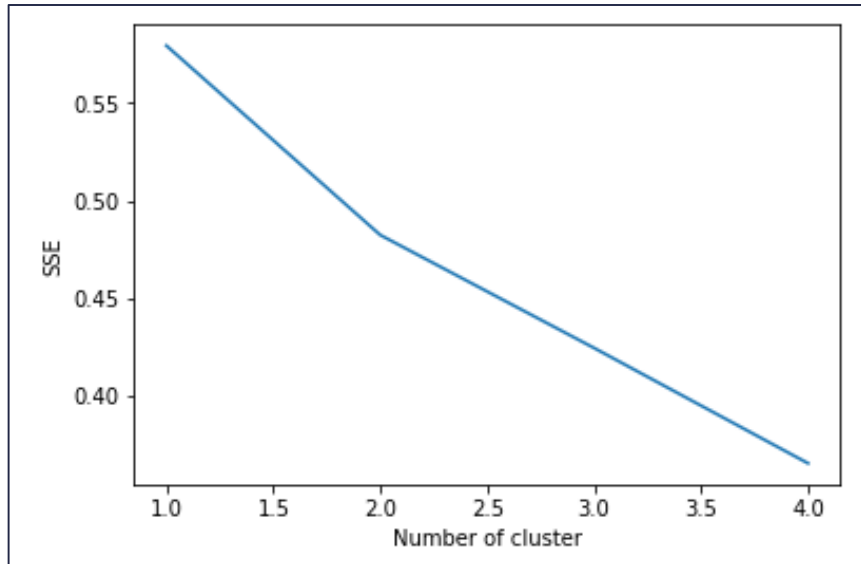
# Finding the Most Common Venues in Districts

	District	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	Alsergrund	Restaurant	Café	Park	Hotel	Tapas Restaurant	Cocktail Bar	Coffee Shop	Plaza	Italian Restaurant	Austrian Restaurant
1	Brigittenau	Supermarket	Plaza	Park	Austrian Restaurant	Italian Restaurant	Restaurant	Kebab Restaurant	Ice Cream Shop	Gym / Fitness Center	Fast Food Restaurant
2	Donaustadt	Fast Food Restaurant	Metro Station	Restaurant	Indian Restaurant	Convenience Store	Soccer Field	Café	Bus Stop	Pizza Place	Breakfast Spot
3	Döbling	Café	Austrian Restaurant	Restaurant	Wine Bar	Italian Restaurant	Bus Stop	Scenic Lookout	Bakery	Mountain	Vineyard
4	Favoriten	Austrian Restaurant	Supermarket	Gym / Fitness Center	Park	Grocery Store	Soccer Field	Bus Stop	Café	Train Station	Fast Food Restaurant
5	Floridsdorf	Supermarket	Shopping Mall	Electronics Store	Fast Food Restaurant	Restaurant	Tram Station	Grocery Store	Gym / Fitness Center	Café	Furniture / Home Store
6	Hernals	Austrian Restaurant	Park	Gastropub	Bus Stop	Hotel	Gluten-free Restaurant	Comfort Food Restaurant	Scenic Lookout	Restaurant	Beer Garden
7	Hietzing	Park	Supermarket	Hotel	Austrian Restaurant	Bakery	Scenic Lookout	Historic Site	Asian Restaurant	Food	Pizza Place
8	Innere Stadt	Hotel	Plaza	Austrian Restaurant	Café	Ice Cream Shop	Restaurant	Park	Japanese Restaurant	Art Museum	Pedestrian Plaza
9	Josefstadt	Coffee Shop	Plaza	Hotel	Park	Tapas Restaurant	Ice Cream Shop	Italian Restaurant	Café	Pizza Place	Gym
10	Landstraße	Hotel	Restaurant	Austrian Restaurant	Concert Hall	Asian Restaurant	Italian Restaurant	Café	Grocery Store	Bakery	Palace
11	Leopoldstadt	Restaurant	Supermarket	Hotel	Café	Gym / Fitness Center	Plaza	Seafood Restaurant	Sports Club	Beer Garden	Bar
12	Liesing	Supermarket	Hotel	Italian Restaurant	Bus Stop	Pharmacy	Plaza	Bakery	Food	Breakfast Spot	Furniture / Home Store
13	Margareten	Austrian Restaurant	Hotel	Plaza	Ice Cream Shop	Coffee Shop	Pizza Place	Restaurant	Burger Joint	Organic Grocery	Japanese Restaurant
14	Mariahilf	Hotel	Ice Cream Shop	Austrian Restaurant	Plaza	Coffee Shop	Restaurant	Pizza Place	Thai Restaurant	Japanese Restaurant	Hostel
15	Meidling	Hotel	Monument / Landmark	Pool	Café	Fountain	Austrian Restaurant	History Museum	Gastropub	Gift Shop	Indie Theater
16	Neubau	Hotel	Plaza	Coffee Shop	Ice Cream Shop	Tapas Restaurant	Art Museum	Gym	Austrian Restaurant	Pizza Place	Park
17	Ottakring	Supermarket	Restaurant	Austrian Restaurant	Café	Wine Bar	Gastropub	Hotel	Italian Restaurant	Tram Station	BBQ Joint
18	Penzing	Restaurant	Trail	Supermarket	Café	Electronics Store	Greek Restaurant	Smoke Shop	Ski Area	Multiplex	Market
19	Rudolfsheim-Funfhaus	Austrian Restaurant	Hotel	Restaurant	Café	History Museum	Ice Cream Shop	Coffee Shop	Persian Restaurant	Tapas Restaurant	Italian Restaurant
20	Simmering	Tram Station	Flower Shop	Fast Food Restaurant	Restaurant	Café	Asian Restaurant	Supermarket	Grocery Store	Bus Stop	Shopping Mall
21	Wieden	Plaza	Hotel	Austrian Restaurant	Ice Cream Shop	Café	Restaurant	Concert Hall	Park	Art Museum	French Restaurant
22	Währing	Supermarket	Café	Park	Austrian Restaurant	Ice Cream Shop	Restaurant	Gastropub	Italian Restaurant	Plaza	Bakery

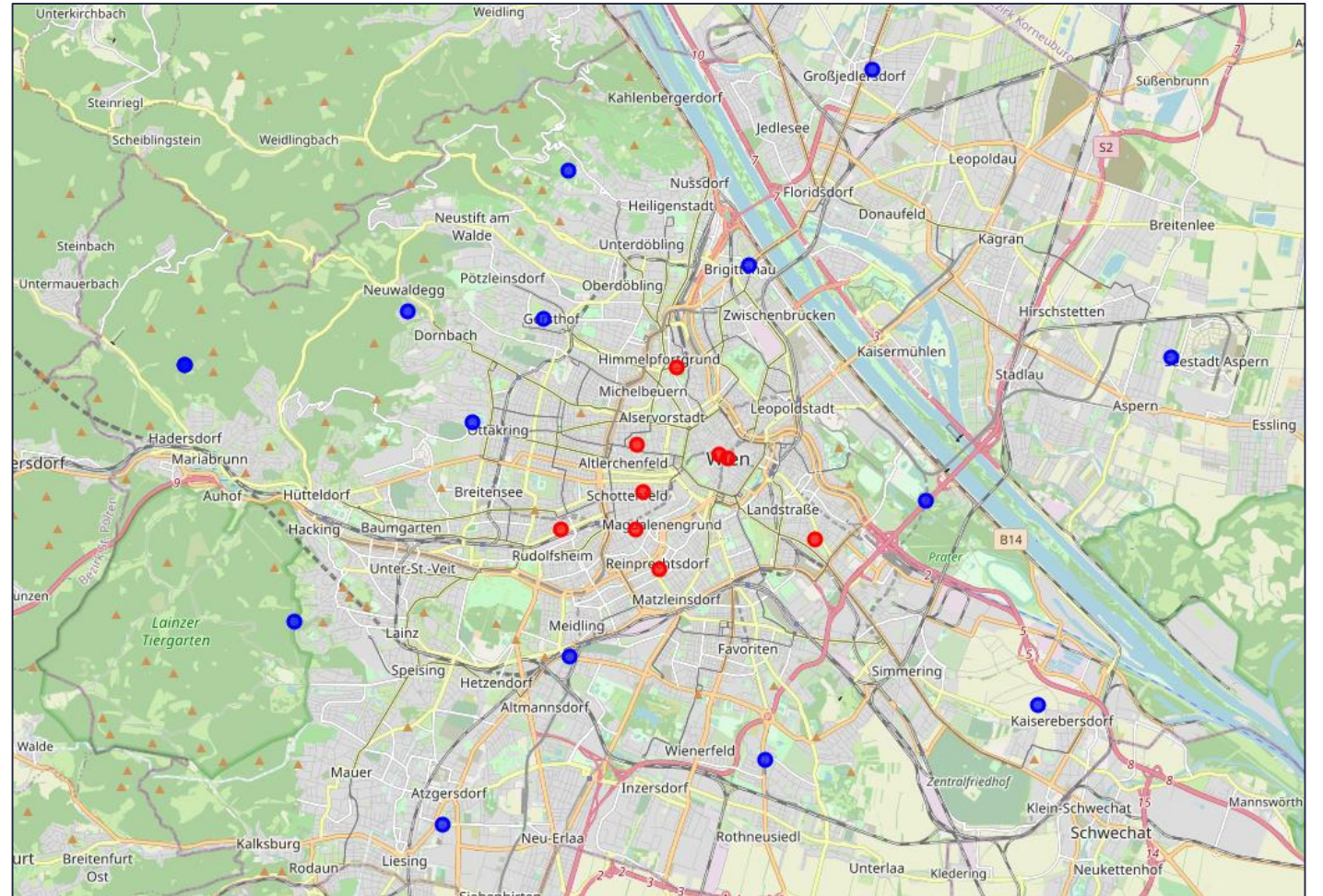
Collected 1'659 venues

211 unique venue categories

# Clustering Districts to Identify Their Types



- Elbow Curve showed that the optimum number of clusters for districts is 2
- Two **area types** for districts (on the right)
  - Commercial / Touristic area (red)
  - Residential area (blue)



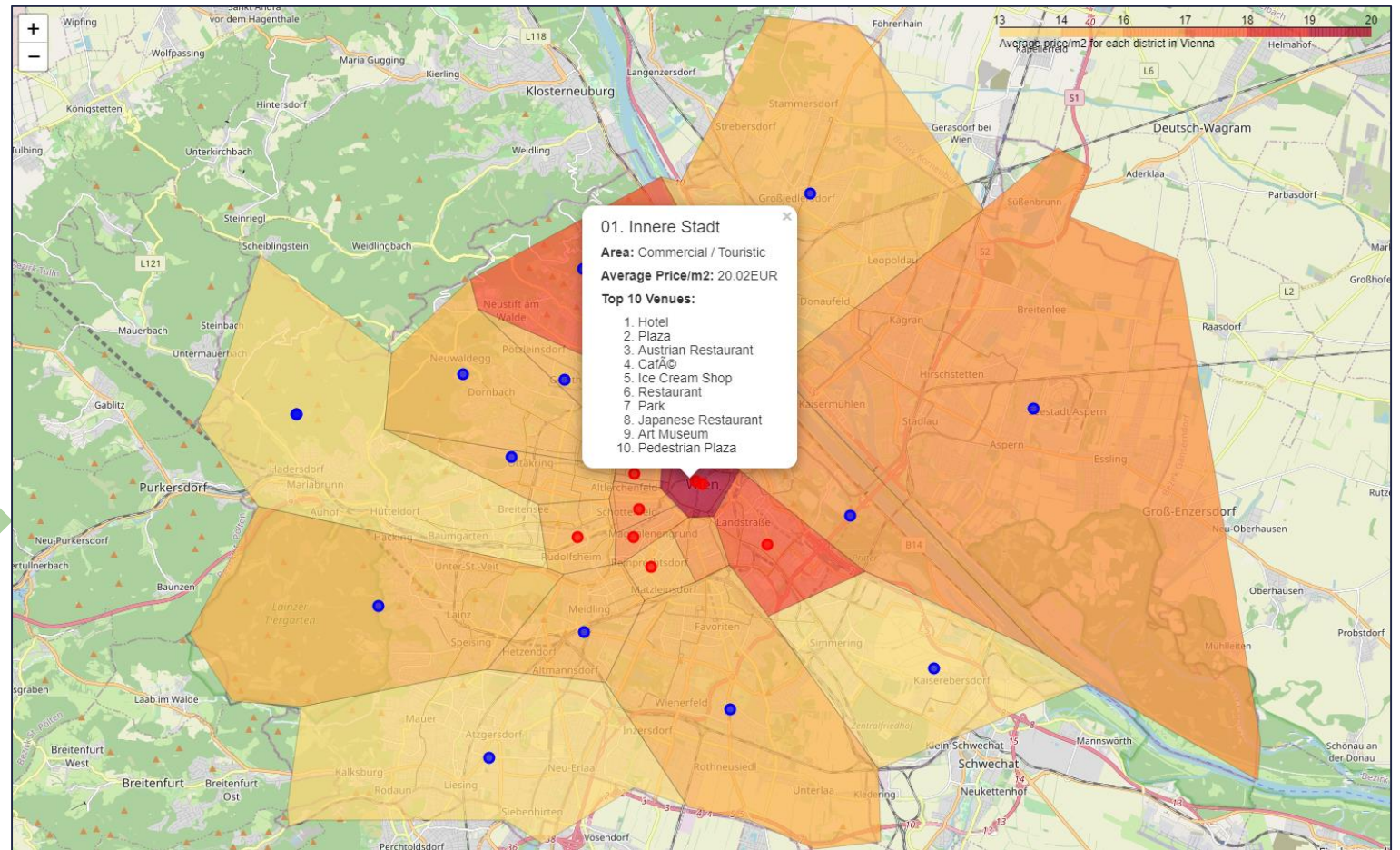


# Results – Map & Useful Information

Combining all of the analysis

**Cloropleth Map** containing the following information:

- ✓ District Name
- ✓ Type of Area
- ✓ Average price/m<sup>2</sup>
- ✓ Top 10 Venues



# Discussion

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**This analysis was based on the dataset for apartments that have 1-5 rooms with apartment size up to 400 m<sup>2</sup>**

- Usually people have more specific needs when they're searching for the apartment.
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**We only used size, number of rooms, price and district information from apartment listings**

- People might want to have other criteria in the analysis to help them with decision-making process
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**One can argue that we clustering did not help to gain valuable insights**

- Categorizing areas into “Commercial / Touristic” and “Residential” may be not sophisticated enough since usually people intuitively understand that districts in the inner circle of the city (city center) are usually considered “Commercial / Touristic” anyway

# Conclusions

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- Having an **interactive map of the city** that enables you to **quickly assess** which district in the city can be more preferable to you to live in is extremely useful
- For this reason, people can make **better decisions** when considering to move to another place to leave (either from another city / country or within the same city)

# Future Directions

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- Similar interactive maps can be created for **multiple cities** around the world to enable cross-city comparisons for those who consider several cities for relocation
- Tool can be further improved by **increasing the level of sophistication** for data inputs and by **providing more information** for apartments under the consideration