

# A Japanese Restaurant in Madrid

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## Introduction/Business Problem

Our stakeholders are interested in opening a Japanese restaurant in Madrid.

We want to find locations that are not overcrowded with restaurants and with no Japanese restaurants in the vicinity.

To find good locations, we will use data science and the Foursquare API.

## Data

Based on definition of our problem, factors that will influence our decision are:

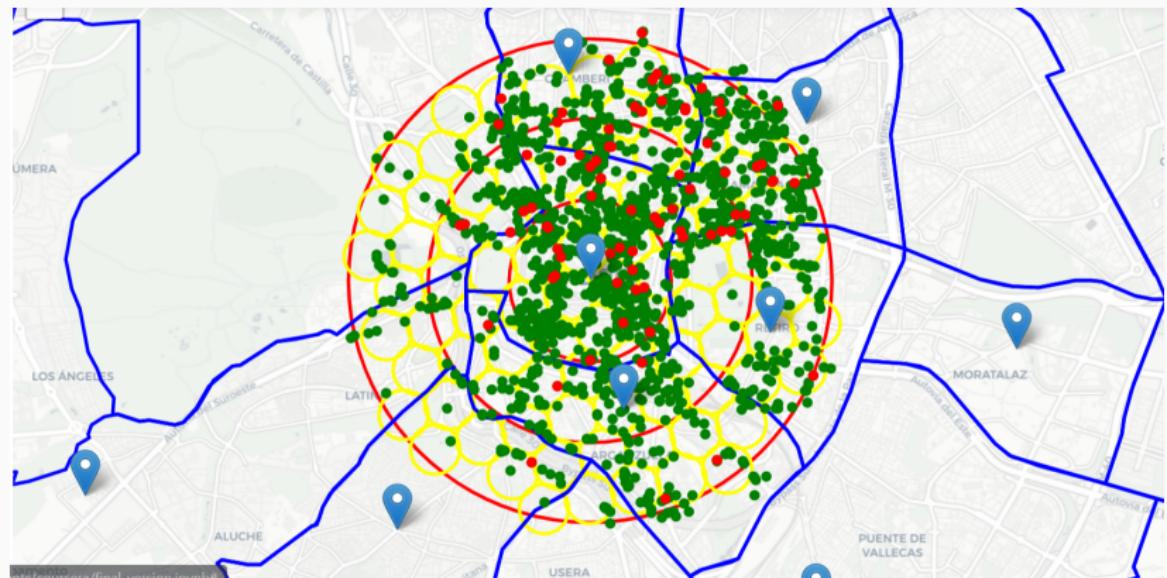
- number of existing restaurants in the neighbourhood (any type of restaurant)
- number of and distance to Japanese restaurants in the neighbourhood, if any
- distance of neighbourhood to city center

## Data

The following data sources will be needed to extract/generate the required information:

- coordinates of Madrid center will be obtained using Geopy of well known Madrid location (Kilómetro Cero - Puerta del Sol, 7, 28013 Madrid, Spain)
- location and limits of each district will be obtained using geopy and an open-source json file
- number of restaurants and their type and location in every neighborhood will be obtained using Foursquare API

# Data



**Figure 1:** Map of Madrid with restaurants found in green and Japanese restaurants in red, 90 area candidates and districts' limits.

## Methodology

We want locations which fulfill as best as possible the following conditions:

- have few restaurants around the candidate location;
- have few Japanese restaurants around the candidate location;
- are close to the center of the city,

We will use heatmaps to evaluate the density of restaurants and Japanese restaurants within 2km of Kilometro Cero.

We will find locations that meet the first two conditions.

We will cluster locations and provide general centers to our stakeholders.

## Methodology - Analysis

In the region of interest:

- exist 1475 restaurants;
- exist 77 Japanese restaurants, i.e., 5.22 % of the total of restaurants;
- Each candidate area has an average of 11.33 restaurants;
- The average distance of the closest Japanese restaurant to each area center is 481.18 meters.

## Methodology - Analysis



Figure 2: Heatmap showing the density of restaurants in Madrid.

Within 2km to the center of the city, there are some pockets in Centro, Arganzuela, Retiro, Latina and Moncloa-Aravaca.

## Methodology - Analysis



Figure 3: Heatmap showing the density of Japanese restaurants in Madrid.

The districts observed in the last heatmap are still good options. Given that the Centro, Arganzuela and Retiro have closest pockets to the center, let's consider only these ones.

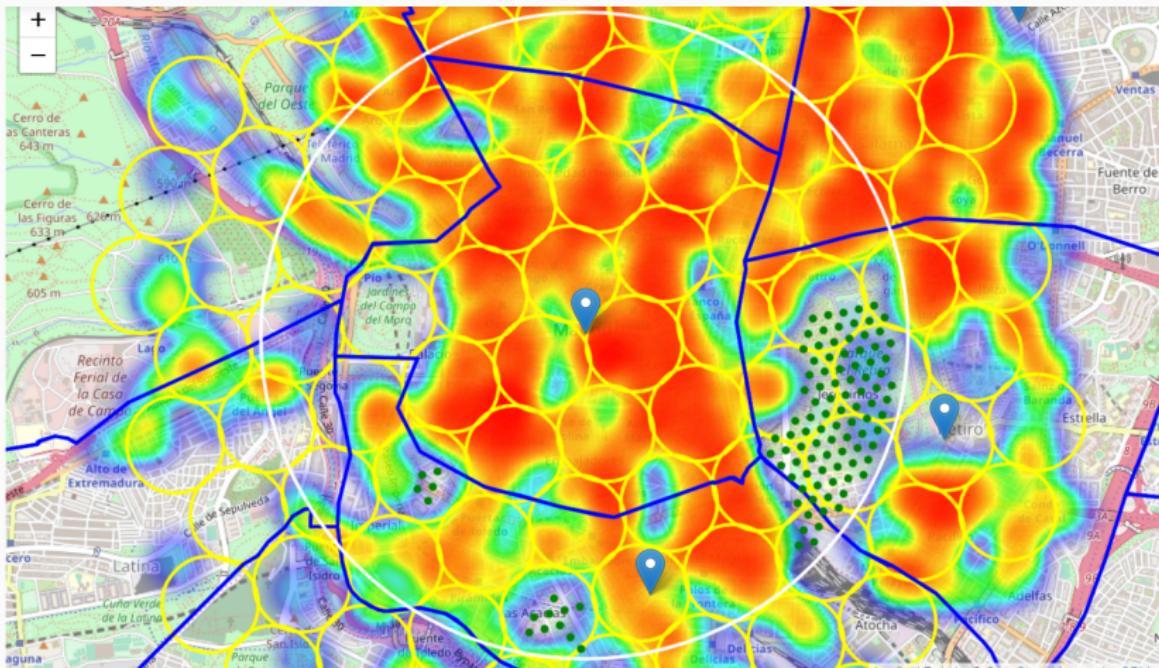
## Methodology - Centro, Arganzuela and Retiro

Within 2km of Kilometro Cero, we found:

- 121 locations with no more than two restaurants within 250 meters
- 343 locations with no Japanese restaurants within 400 meters
- 108 locations with no more than two restaurants within 250 meters and no Japanese restaurants within 400 meters

The 108 locations that meet both conditions are represented as green circles on Figure 4, as expected in “cold” regions of the heatmap. These are further clustered on Figure 5.

## Methodology - Centro, Arganzuela and Retiro



**Figure 4:** Good locations for Japanese restaurants as green circles in a heatmap of Madrid.

## Methodology - Centro, Arganzuela and Retiro

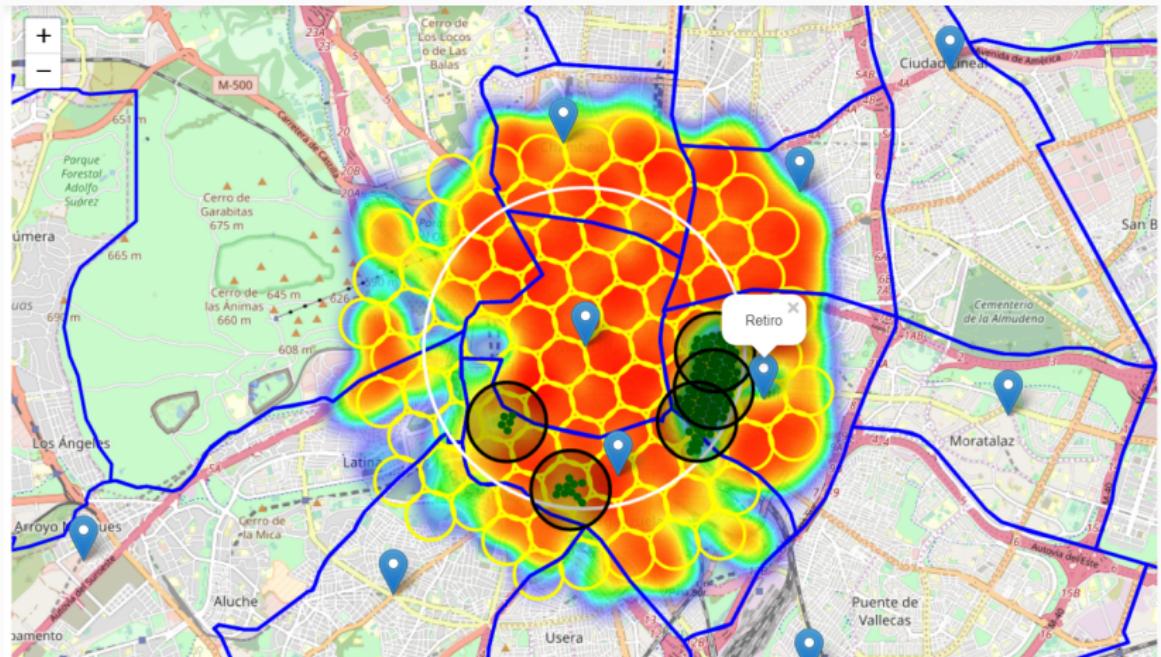


Figure 5: Clusters of good locations for Japanese restaurants in black in a heatmap of Madrid.

## Methodology - Centro, Arganzuela and Retiro

The following are the addresses of the clusters found:

- Povets, Albocàsser, l'Alt Maestrat, Castelló / Castellón, Comunitat Valenciana - 1.7km from Kilometro Cero
- Albocàsser, l'Alt Maestrat, Castelló / Castellón, Comunitat Valenciana - 1.8km from Kilometro Cero
- Barranc d'en Cabrera, Albocàsser, l'Alt Maestrat, Castelló / Castellón, Comunitat Valenciana - 1.7km from Kilometro Cero
- Barranc d'en Cabrera, Albocàsser, l'Alt Maestrat, Castelló / Castellón, Comunitat Valenciana - 1.4km from Kilometro Cero
- Barranc d'en Cabrera, Albocàsser, l'Alt Maestrat, Castelló / Castellón, Comunitat Valenciana - 1.8km from Kilometro Cero

## Methodology - Centro, Arganzuela and Retiro

Three of them are the same address, as expected from Figure 5, where three clusters overlap in Retiro.

Still, we have found three different addresses to propose to our stakeholders!

## Results and Discussion

- Although there are a great number of restaurants in Madrid ( $\approx 1500$  within 3km from Kilometro Cero), there are pockets of low restaurant density fairly close to city center.
- In Centro, Retiro and Arganzuela, we found regions with low restaurant density and Japanese restaurant density.
- We found good locations in Retiro and Arganzuela (Centro turned out to not be a good option) and clustered them.
- We provided 3 different addresses to our stakeholders.

## Results and Discussion

### Are these the optimal locations?

Not necessarily. We completed our objective of finding locations close to the center of Madrid, which were not overcrowded with existing restaurants (particularly Japanese).

However, there may exist other factors than competition that will affect the decision of our stakeholders.

Nonetheless, this analysis is certainly a starting point.

## Conclusions

We intended to Madrid areas close to center with low number of restaurants (particularly Japanese restaurants) in order to aid stakeholders in narrowing down the search for optimal location for a new Japanese restaurant.

We evaluated the restaurant density in Madrid using data from Foursquare. This allowed us to find good locations in Retiro and Arganzuela, which we then clustered.

Final decision on optimal restaurant location will be made by stakeholders based on specific characteristics of districts and locations in every recommended zone, taking into consideration additional factors