Classification of Milan Hotels for Winter Games 2026

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Applied Data Science Coursera Capstone Project
The Battle of Neighborhoods - Final Report (Week 2)

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1 Introduction Section:

1.1 Discussion of the business problem and the audience who would be interested in this project.

1.1.1 A description of the problem and a discussion of the background.

Italy will host the 2026 Winter Games, the International Olympic Committee (the "IOC") announced on June 24. The IOC, which organizes the Winter and Summer Games, chose a bid from Milan and the Alpine ski resort of Cortina d'Ampezzo over a single rival bid from the Swedish capital of Stockholm and the village of Åre. The IOC Executive Board and IOC Session adopted a report entitled the "Olympic Games: The New Norm" in February 2018. It includes over one hundred practical measures aimed at reducing the cost and complexity of the Olympic and Paralympic Games delivery model and covers the entire lifecycle of a Games edition from candidature to organization and legacy. The Host City Contract (HCC)– Principles 2026, is the contract concluded between the IOC and the city elected to host the Olympic and Paralympic Games (the "Host City"), the National Olympic Committee of the Host Country (the "Host NOC") and Organizing Committees for the Olympic and Paralympic Games (OCOG).
The HCC - Operational Requirements document lists key requirements applicable to the planning, organizing, financing and staging of the Games.

Sufficient, well-located and reasonably priced accommodation allows all Olympic and Paralympic stakeholders to fulfill their duties in the period before, during and immediately after the Games. For the Accommodation area, key success factors include:

1. Binding and fair accommodation pricing and availability guarantees for all categories of accommodation;

2. Strict adherence to accommodation requirements and timetables for various stakeholder groups; and

3. Close coordination with interdependent areas, including the Arrivals and Departures, Finance and Transport areas and the respective stakeholder organizations outlined in the requirements tables of the HCC.

1.1.2 Problem to be resolved:

The "Stakeholder Group Accommodation Requirements Table" outlines that International Federation (IF) Group should be accommodated to 4 different cluster of hotels based on the quality and level of service to their customers. The challenge to resolve is being able to find hotels in Milan that offer such a requirement. Therefore, I want to find a hotel subject to the following conditions:

- Hotels with (2 <= Star Rating <= 4)
- Unit located within walking distance (<=1.0 km) from a subway metro station in Milan
- Area with most amenities and venues

1.1.3 Interested Audience

I believe this is a relevant project for the IOC and other Olympic Movement stakeholders that closely collaborate with the OCOG to identify innovative solutions and customize requirements to

better reflect the local context in order to achieve the objectives of the New Norm, i.e. to make the Olympic Games delivery cost-efficient and effective.. The use of FourSquare data and mapping techniques combined with data analysis will help resolve the key questions arisen. Lastly, this project is a good practical case toward the development of Data Science skills.

2 Data Section:

2.1 Description of the data and its sources that will be used to solve the problem

2.1.1 Data Required to resolve the problem

In order to make a good choice of a hotel in Milan, the following data is required:

- List/Information on neighborhoods form Milan with their geodata (latitude and longitude).
- List/Information about the subway metro stations in Milan with geodata.
- Listed hotels in Milan area with descriptions (Quality, location, address)
- Venues and amenities in the Milan neighborhoods (e.g. top 10)

2.1.2 Sources and manipulation

- The list of Milan neighborhoods will be extracted from Wikipedia Page (https://it.Wikipediaorg/wiki/Municipi_di_Milano) using Web Scraping.
- List of accommodation facilities in Milan area with descriptions will be obtained from DatiOpen.it Website (http://www.datiopen.it/it/opendata/Regione_Lombardia_Mappa_delle_strutture_ricettive).
- The Foursquare Platform is the main source to identify any location and find places nearby.
- The geolocation will be obtained via an algorithm using Nominatim.

2.1.3 How the data will be used to solve the problem

The data will be used as follows:

- Use Foursquare and geopy data to map top 10 venues for all Milan neighborhoods and clustered in groups.
- Use foursquare and geopy data to map the location of subway metro stations, separately and on top of the above clustered map in order to be able to identify the venues and amenities near each metro station, or explore each subway location separately
- Use Foursquare and geopy data to map the location of hotels, in some form, linked to the subway locations.
- create a map that depicts, for instance, the quality of hotels, around a radius of 1.0 km each subway station - or a similar metrics. I will be able to quickly point to the popups to know the relative quality per subway area.
- Addresses from hotel locations will be converted to geodata (lat, long) using Geopy-distance and Nominatim.
- Data will be searched in from DatiOpen.it Website, or other government agencies.

3 Methodology section:

3.1 Process steps and strategy to resolve the problem

In this project I will direct my efforts on hotels of Milan which can best satisfy the needs of IOC stakeholder groups outlined in the requirements tables of the HCC, particularly those with most amenities and venues. I will limit my analysis to hotels ~1 km around subway stations. In first step I have collected the required data: Get access to full details list of all hotels in Milan (Star Ratings, location, address) through DatiOpen.it Website. The complete list of subway stations, split by borough, in Milan will be obtained from a Wikipedia page using web scraping. Venues and amenities in the Milan neighborhoods should be found using Foursquare API. Second step in our analysis will be calculation and exploration of 'closest subway station' across different areas of Milan - and focus the attention on those areas. In third and final step I will focus on most promising areas and within those create clusters of locations that meet some basic requirements established in HCC. I will take into consideration locations with most amenities and venues in radius of 500 meters. I will present map of all such locations but also create clusters (using k-means clustering) of those locations to identify general zones / neighborhoods / addresses which should be a starting point for final exploration and search for optimal location by IOC.

3.2 Data Science Methods, machine learning, mapping tools and exploratory data analysis.

3.2.1 Using the BeautifulSoup package for web scraping.

Web scraping is used for extracting data about the subway metro stations in Milan from a Wikipedia page.

```
wiki_url = 'https://it.Wikipediaorg/wiki/Stazioni_della_metropolitana_di_Milano'
wiki_page = requests.get(wiki_url).text
wiki_doc = BeautifulSoup(wiki_page, 'lxml')

# get the table containing the postal codes
stations_table = wiki_doc.find('table', {'class': 'wikitable sortable'})
stations_table
```

	Stazione	Città	Municipio
0	Abbiategrasso	Milano	Municipio 5
1	Affori Centro	Milano	Municipio 9
2	Affori FN	Milano	Municipio 9
3	Amendola	Milano	Municipio 8
4	Assago Milanofiori Forum	Assago	-
5	Assago Milanofiori Nord	Assago	-
6	Bande Nere	Milano	Municipio 6
7	Bicocca	Milano	Municipio 9
8	Bignami	Milano	Municipio 9
9	Bisceglie	Milano	Municipio 6

The Milan Metro network consists of 4 lines, with a total network length of 96.8 kilometers, and a total of 106 stations, mostly underground. It has a daily ridership of about 1.4 million on weekdays. For this analysis, the list/information of the Metropolitan City of Milan will be considered.

```
        Stazione   Città    Municipio
0  Abbiategrasso  Milano  Municipio 5
1  Affori Centro  Milano  Municipio 9
2      Affori FN  Milano  Municipio 9
3       Amendola  Milano  Municipio 8
6     Bande Nere  Milano  Municipio 6
```

3.2.2 Using Nominatim API to find geolocation data.

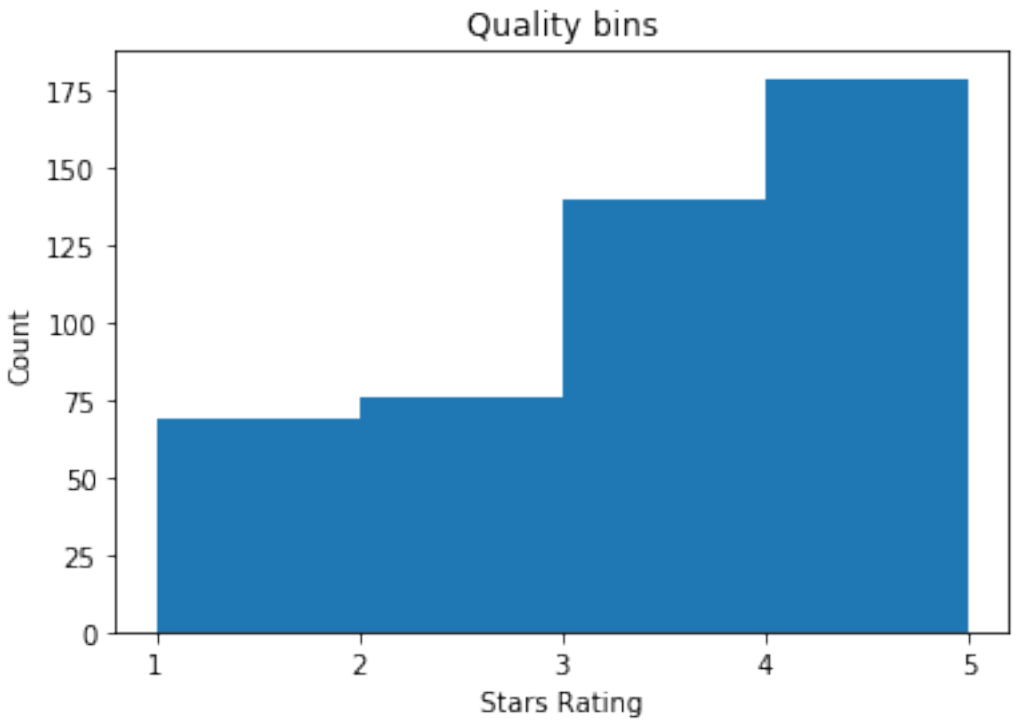
In the following, I use the Open Search (Nominatim) API to reverse geocode.

```
        Stazione   Città    Municipio   Latitude  Longitude
0  Abbiategrasso  Milano  Municipio 5  45.397550   8.920110
1  Affori Centro  Milano  Municipio 9  45.579173   9.156239
2      Affori FN  Milano  Municipio 9  45.579173   9.156239
3       Amendola  Milano  Municipio 8  45.579173   9.156239
6     Bande Nere  Milano  Municipio 6  45.484210   9.201110
```

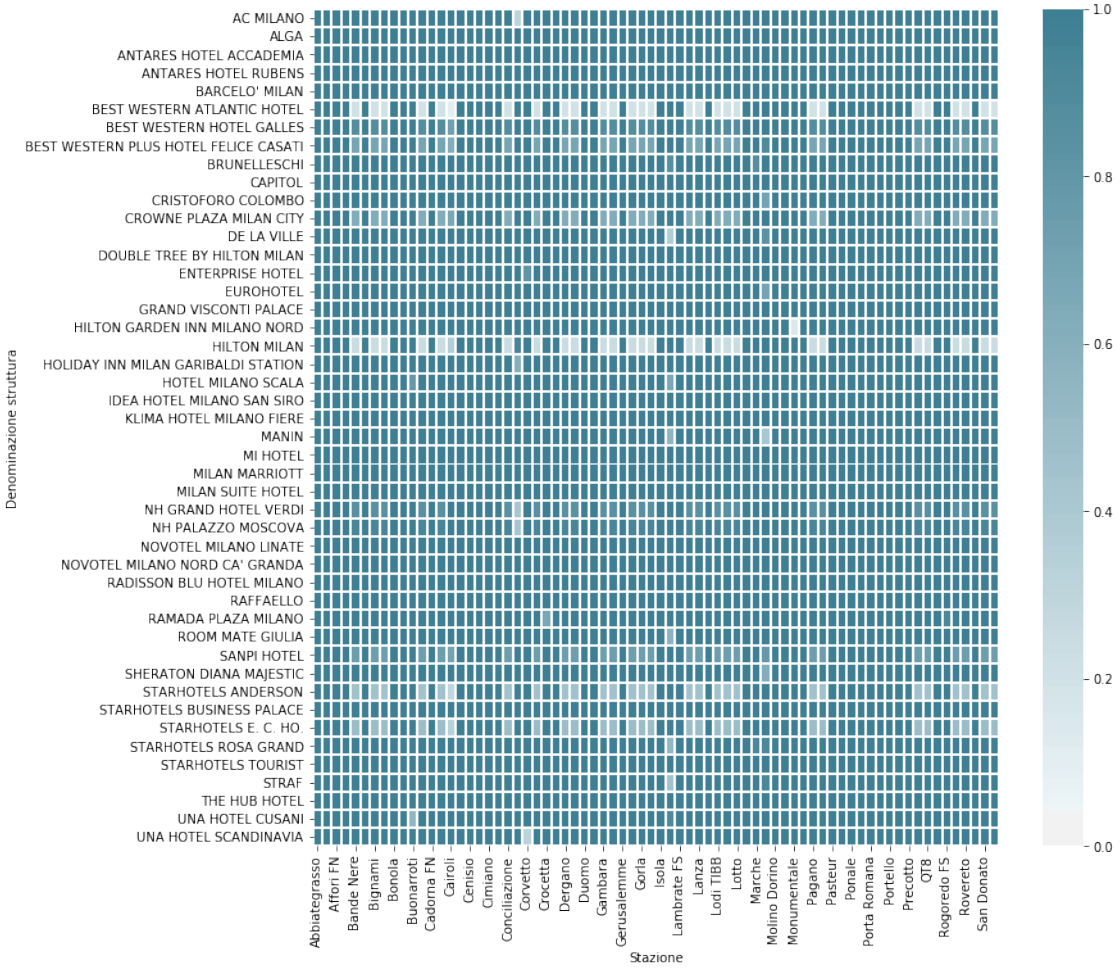
The Municipality of Milan website presents the registry list of the accommodation facilities exist in the Municipality of Milan. The following information is provided for each structure:

- Denomination: Name of the accommodation facility;
- Category: Classification of the structure (Stars Rating);
- Rooms: Total number of rooms;
- Total floors: Total number of floors;
- Floor rooms: Number of rooms per floor;
- Number of services: Total provision of services;
- Number of floor services: Number of services per floor;
- Floor plan: type of floor (R, 1, 2, ..);
- Beds: Total number of beds;
- Beds on the floor: Number of beds per floor.

The following figure shows the "Classification of the Structure (Stars Rating)" of the accommodation facilities exist in Milan:



I have first identified hotels that satisfy some basic requirements of IOC Host City Contract, then by finding closest subway station to each hotel using Nominatim API, the following results have been obtained:



	Name	Nearby Station	Distance
0	AC MILANO	Cordusio	0.316469
1	ALGA	Moscova	4.44708
2	ANTARES HOTEL ACCADEMIA	Corvetto	1.78104
3	ANTARES HOTEL RUBENS	Moscova	1.55387
4	BARCELO' MILAN	Famagosta	2.13185

	Name	Nearby Station	Distance
0	AC MILANO	Cordusio	0.316469
1	BEST WESTERN ATLANTIC HOTEL	Cairoli	0.0918505
2	BEST WESTERN HOTEL GALLES	Cairoli	0.730175
3	BEST WESTERN PLUS HOTEL FELICE CASATI	Cairoli	0.623737
4	BRUNELLESCHI	Istria	0.864206

	Name	Nearby Station	Distance	Latitude	\
0	AC MILANO	Cordusio	0.316469	45.485047	
1	BEST WESTERN ATLANTIC HOTEL	Cairoli	0.0918505	45.483196	
2	BEST WESTERN HOTEL GALLES	Cairoli	0.730175	45.480217	

```
3  BEST WESTERN PLUS HOTEL FELICE CASATI        Cairoli   0.623737  45.478452
4                          BRUNELLESCHI         Istria   0.864206  45.461090

   Longitude      Borough
0   9.183956  Municipio 5
1   9.203135  Municipio 9
2   9.210845  Municipio 9
3   9.204229  Municipio 8
4   9.191421  Municipio 6
```

3.2.3 Using Foursquare

The Foursquare Places API provides location based experiences with diverse information about venues, users, photos, and check-ins. The API supports real time access to places, Snap-to-Place that assigns users to specific locations, and Geo-tag. Additionally, Foursquare allows developers to build audience segments for analysis and measurement. JSON is the preferred response format.

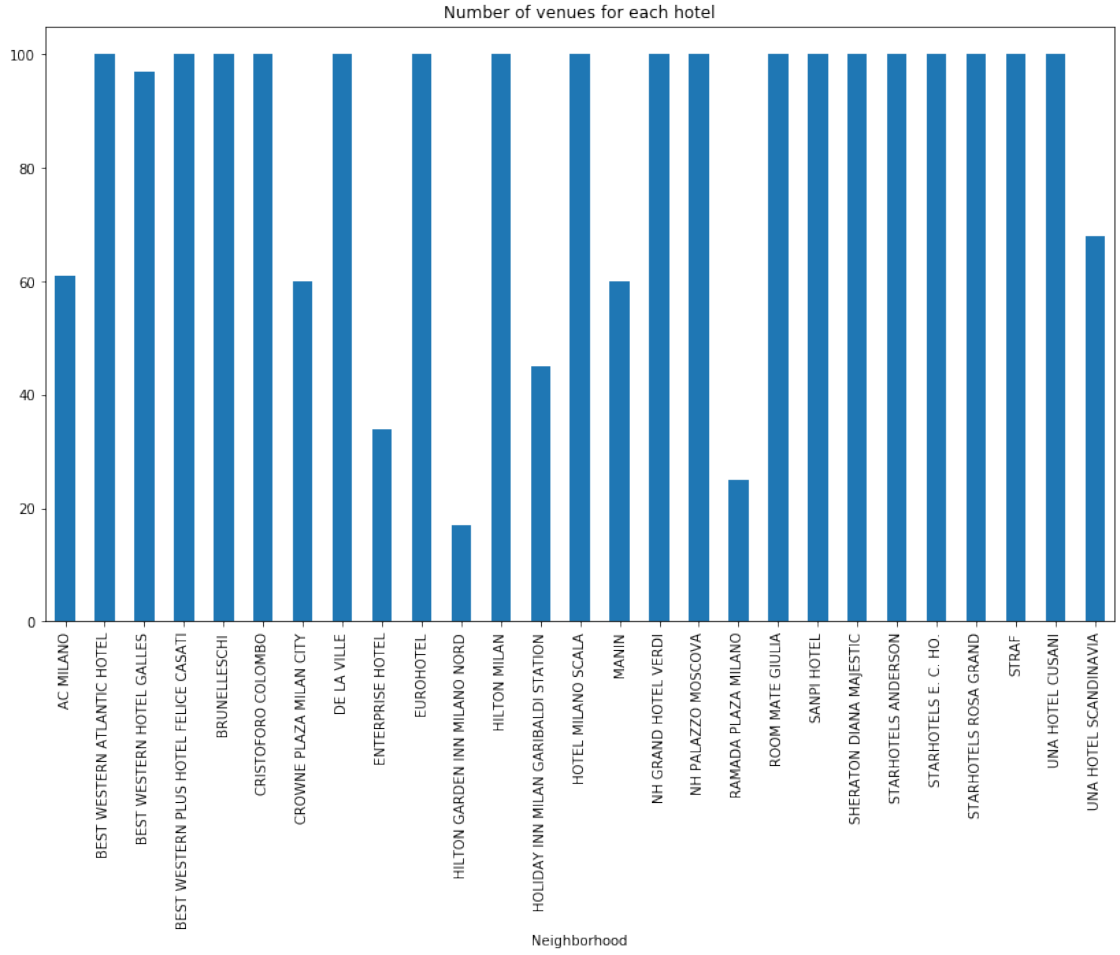
```
  Neighborhood  Neighborhood Latitude  Neighborhood Longitude  \
0    AC MILANO              45.485047                9.183956
1    AC MILANO              45.485047                9.183956
2    AC MILANO              45.485047                9.183956
3    AC MILANO              45.485047                9.183956
4    AC MILANO              45.485047                9.183956

                         Venue  Venue Latitude  Venue Longitude  \
0     Osteria dei Vecchi Sapori       45.486403         9.186558
1  Ceresio 7 Pools & Restaurant       45.484025         9.179849
2         La Griglia di Varrone       45.482685         9.186148
3           Pizzeria da Martino       45.483547         9.181679
4            Trattoria Ferrelli       45.483271         9.181600

       Venue Category
0  Italian Restaurant
1  Italian Restaurant
2         Steakhouse
3        Pizza Place
4   Trattoria/Osteria
```

3.2.4 Venues returned for each Neighborhood Location

```
                                                Venue  \
Neighborhood
AC MILANO                                          61
BEST WESTERN ATLANTIC HOTEL                       100
BEST WESTERN HOTEL GALLES                          97
BEST WESTERN PLUS HOTEL FELICE CASATI             100
BRUNELLESCHI                                      100
```

CRISTOFORO COLOMBO	100
CROWNE PLAZA MILAN CITY	60
DE LA VILLE	100
ENTERPRISE HOTEL	34
EUROHOTEL	100
HILTON GARDEN INN MILANO NORD	17
HILTON MILAN	100
HOLIDAY INN MILAN GARIBALDI STATION	45
HOTEL MILANO SCALA	100
MANIN	60
NH GRAND HOTEL VERDI	100
NH PALAZZO MOSCOVA	100
RAMADA PLAZA MILANO	25
ROOM MATE GIULIA	100
SANPI HOTEL	100
SHERATON DIANA MAJESTIC	100
STARHOTELS ANDERSON	100
STARHOTELS E. C. HO.	100
STARHOTELS ROSA GRAND	100
STRAF	100
UNA HOTEL CUSANI	100
UNA HOTEL SCANDINAVIA	68

There are 180 uniques categories.



3.2.5 Analyzing each Neighborhood Location

Let's perform some basic explanatory data analysis and derive some additional info from our raw data. Grouping rows by neighborhood and by taking the mean of the frequency of occurrence of each category lead to the following results:

```
----AC MILANO----
                venue  freq
0   Italian Restaurant  0.15
1         Pizza Place  0.07
2               Café  0.07
3  Japanese Restaurant  0.05
4          Restaurant  0.05


----BEST WESTERN ATLANTIC HOTEL----
                venue  freq
0  Italian Restaurant  0.18
```

```
1               Hotel  0.13
2                Café  0.13
3         Pizza Place  0.05
4      Sandwich Place  0.05


----BEST WESTERN HOTEL GALLES----
                venue  freq
0         Pizza Place  0.09
1  Italian Restaurant  0.08
2                Café  0.05
3               Hotel  0.05
4      Ice Cream Shop  0.05


----BEST WESTERN PLUS HOTEL FELICE CASATI----
                venue  freq
0  Italian Restaurant  0.11
1         Pizza Place  0.08
2                Café  0.07
3               Hotel  0.07
4        Cocktail Bar  0.05


----BRUNELLESCHI----
                venue  freq
0               Hotel  0.10
1  Italian Restaurant  0.09
2         Pizza Place  0.06
3      Ice Cream Shop  0.04
4                Café  0.04


----CRISTOFORO COLOMBO----
                           venue  freq
0             Italian Restaurant  0.09
1                           Café  0.07
2                    Pizza Place  0.06
3  Vegetarian / Vegan Restaurant  0.05
4                          Hotel  0.05


----CROWNE PLAZA MILAN CITY----
                  venue  freq
0    Italian Restaurant  0.13
1                 Café  0.12
2                Hotel  0.10
3           Pizza Place  0.08
```

```
4  Gym / Fitness Center  0.03


----DE LA VILLE----
                venue  freq
0  Italian Restaurant  0.08
1            Boutique  0.08
2               Plaza  0.07
3               Hotel  0.06
4      Clothing Store  0.06


----ENTERPRISE HOTEL----
                venue  freq
0  Italian Restaurant  0.18
1          Restaurant  0.09
2               Hotel  0.06
3  Seafood Restaurant  0.06
4    Basketball Court  0.06


----EUROHOTEL----
                           venue  freq
0             Italian Restaurant  0.12
1                   Pizza Place  0.07
2                          Café  0.05
3  Vegetarian / Vegan Restaurant  0.04
4                          Hotel  0.04


----HILTON GARDEN INN MILANO NORD----
                venue  freq
0  Italian Restaurant  0.18
1          Restaurant  0.12
2             Theater  0.12
3              Bakery  0.06
4              Office  0.06


----HILTON MILAN----
                venue  freq
0  Italian Restaurant  0.18
1               Hotel  0.15
2                Café  0.10
3          Restaurant  0.04
4         Pizza Place  0.04
```

```
----HOLIDAY INN MILAN GARIBALDI STATION----
                venue  freq
0  Italian Restaurant  0.16
1               Café  0.11
2                Pub  0.07
3         Pizza Place  0.04
4      Ice Cream Shop  0.04


----HOTEL MILANO SCALA----
                venue  freq
0  Italian Restaurant  0.14
1              Plaza  0.08
2              Hotel  0.07
3      Ice Cream Shop  0.06
4             Theater  0.04


----MANIN----
                venue  freq
0            Boutique  0.13
1               Hotel  0.12
2  Italian Restaurant  0.08
3               Café  0.07
4               Park  0.05


----NH GRAND HOTEL VERDI----
                venue  freq
0  Italian Restaurant  0.14
1         Pizza Place  0.06
2          Restaurant  0.06
3               Hotel  0.05
4        Cocktail Bar  0.04


----NH PALAZZO MOSCOVA----
                venue  freq
0  Italian Restaurant  0.11
1          Restaurant  0.07
2         Pizza Place  0.06
3      Ice Cream Shop  0.05
4               Hotel  0.04


----RAMADA PLAZA MILANO----
                venue  freq
0  Italian Restaurant  0.28
```

```
1         Pizza Place  0.16
2                Park  0.08
3      Sandwich Place  0.08
4              Hotel  0.04


----ROOM MATE GIULIA----
                venue  freq
0  Italian Restaurant  0.08
1              Plaza  0.06
2              Hotel  0.06
3      Ice Cream Shop  0.06
4         Pizza Place  0.06


----SANPI HOTEL----
                venue  freq
0  Italian Restaurant  0.12
1              Hotel  0.07
2               Café  0.07
3        Cocktail Bar  0.06
4         Pizza Place  0.06


----SHERATON DIANA MAJESTIC----
                venue  freq
0  Italian Restaurant  0.11
1         Pizza Place  0.08
2                Café  0.04
3              Bistro  0.04
4              Bakery  0.03


----STARHOTELS ANDERSON----
                venue  freq
0              Hotel  0.19
1               Café  0.12
2  Italian Restaurant  0.11
3         Pizza Place  0.08
4      Ice Cream Shop  0.04


----STARHOTELS E. C. HO.----
                venue  freq
0              Hotel  0.18
1               Café  0.12
2  Italian Restaurant  0.11
3         Pizza Place  0.09
```

```
4      Ice Cream Shop  0.05


----STARHOTELS ROSA GRAND----
                venue  freq
0               Hotel  0.07
1  Italian Restaurant  0.07
2      Clothing Store  0.06
3               Plaza  0.06
4            Boutique  0.05


----STRAF----
                venue  freq
0  Italian Restaurant  0.08
1               Plaza  0.07
2      Ice Cream Shop  0.06
3               Hotel  0.06
4      Clothing Store  0.05


----UNA HOTEL CUSANI----
                venue  freq
0  Italian Restaurant  0.14
1               Plaza  0.07
2               Hotel  0.06
3      Ice Cream Shop  0.06
4               Café  0.05


----UNA HOTEL SCANDINAVIA----
                 venue  freq
0   Italian Restaurant  0.10
1          Pizza Place  0.09
2                Café  0.07
3           Restaurant  0.07
4  Japanese Restaurant  0.06
```

3.2.6 Create the new dataframe and display the top 10 venues for each neighborhood.

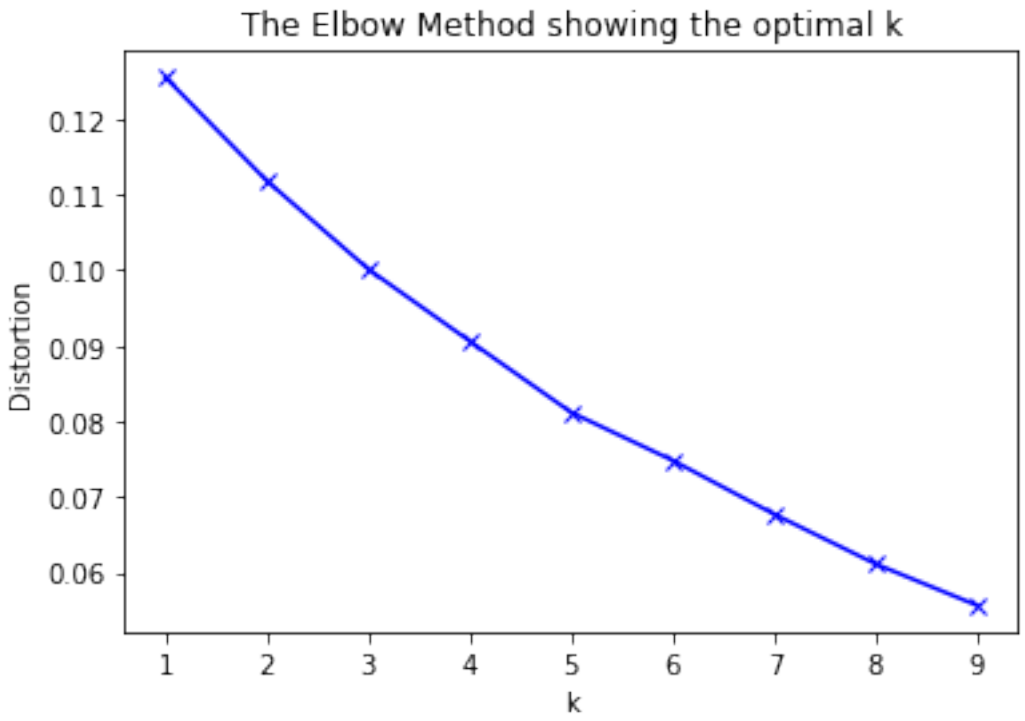
```
                           Neighborhood 1st Most Common Venue  \
0                             AC MILANO    Italian Restaurant
1            BEST WESTERN ATLANTIC HOTEL    Italian Restaurant
2              BEST WESTERN HOTEL GALLES           Pizza Place
3  BEST WESTERN PLUS HOTEL FELICE CASATI    Italian Restaurant
```

```
4                          BRUNELLESCHI                Hotel

  2nd Most Common Venue 3rd Most Common Venue 4th Most Common Venue  \
0           Pizza Place                 Café            Restaurant
1                 Hotel                 Café        Sandwich Place
2    Italian Restaurant       Ice Cream Shop                 Hotel
3           Pizza Place                Hotel                 Café
4    Italian Restaurant          Pizza Place        Ice Cream Shop

  5th Most Common Venue 6th Most Common Venue 7th Most Common Venue  \
0          Cocktail Bar   Japanese Restaurant                Bistro
1           Pizza Place       Ice Cream Shop   Japanese Restaurant
2                 Café         Cocktail Bar        Sandwich Place
3          Cocktail Bar       Ice Cream Shop                   Bar
4                 Café         Burger Joint          Gourmet Shop

  8th Most Common Venue          9th Most Common Venue  \
0               Bakery                      Bookstore
1    Chinese Restaurant                  Cocktail Bar
2               Bakery            Japanese Restaurant
3        Clothing Store  Vegetarian / Vegan Restaurant
4          Dessert Shop                         Plaza

         10th Most Common Venue
0                        Plaza
1                       Bistro
2  Vegetarian / Vegan Restaurant
3             Seafood Restaurant
4                   Cocktail Bar
```

3.2.7 Clustering Neighborhoods

For this project I am using the K-means Clustering algorithm to cluster the neighborhoods. This is one of the simplest algorithms which is vastly used for clustering in many data science applications, especially useful if you need to quickly discover insights from the unlabeled data.

"How would we know the actual number of clusters, to begin with?" For the k-means clustering method, the most common approach for answering this question is the so-called elbow method. It involves running the algorithm multiple times over a loop, with an increasing number of cluster choice and then plotting a clustering score as a function of the number of clusters.



	Neighborhood	Nearby Station	DistanceTo	Latitude	\
0	AC MILANO	Cordusio	0.316469	45.485047	
1	BEST WESTERN ATLANTIC HOTEL	Cairoli	0.0918505	45.483196	
2	BEST WESTERN HOTEL GALLES	Cairoli	0.730175	45.480217	
3	BEST WESTERN PLUS HOTEL FELICE CASATI	Cairoli	0.623737	45.478452	
4	BRUNELLESCHI	Istria	0.864206	45.461090	
5	CRISTOFORO COLOMBO	Missori	0.706305	45.475525	
6	CROWNE PLAZA MILAN CITY	Bande Nere	0.633605	45.489908	
7	DE LA VILLE	Istria	0.364456	45.465941	
8	ENTERPRISE HOTEL	Corvetto	0.811804	45.486774	
9	EUROHOTEL	Missori	0.710742	45.474205	

	Longitude	Borough	Cluster Labels	1st Most Common Venue	\
0	9.183956	Municipio 5	1	Italian Restaurant	
1	9.203135	Municipio 9	0	Italian Restaurant	
2	9.210845	Municipio 9	1	Pizza Place	
3	9.204229	Municipio 8	1	Italian Restaurant	
4	9.191421	Municipio 6	2	Hotel	
5	9.206123	Municipio 9	1	Italian Restaurant	
6	9.201365	Municipio 9	0	Italian Restaurant	
7	9.191963	Municipio 6	2	Italian Restaurant	
8	9.157535	Municipio 8	1	Italian Restaurant	
9	9.207658	Municipio 4	1	Italian Restaurant	

	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue
0	Pizza Place	Café	Restaurant
1	Hotel	Café	Sandwich Place
2	Italian Restaurant	Ice Cream Shop	Hotel
3	Pizza Place	Hotel	Café
4	Italian Restaurant	Pizza Place	Ice Cream Shop
5	Café	Pizza Place	Vegetarian / Vegan Restaurant
6	Café	Hotel	Pizza Place
7	Boutique	Plaza	Hotel
8	Restaurant	Hotel	Basketball Court
9	Pizza Place	Café	Vegetarian / Vegan Restaurant

	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue
0	Cocktail Bar	Japanese Restaurant	Bistro
1	Pizza Place	Ice Cream Shop	Japanese Restaurant
2	Café	Cocktail Bar	Sandwich Place
3	Cocktail Bar	Ice Cream Shop	Bar
4	Café	Burger Joint	Gourmet Shop
5	Hotel	Seafood Restaurant	Clothing Store
6	Bistro	Sandwich Place	Restaurant
7	Clothing Store	Cocktail Bar	Ice Cream Shop
8	Seafood Restaurant	Health Food Store	Mexican Restaurant
9	Hotel	Seafood Restaurant	Bakery

	8th Most Common Venue	9th Most Common Venue
0	Bakery	Bookstore
1	Chinese Restaurant	Cocktail Bar
2	Bakery	Japanese Restaurant
3	Clothing Store	Vegetarian / Vegan Restaurant
4	Dessert Shop	Plaza
5	Bakery	Ice Cream Shop
6	Sushi Restaurant	Breakfast Spot
7	Women's Store	Dessert Shop
8	Diner	Nightclub
9	Gay Bar	Bistro

	10th Most Common Venue
0	Plaza
1	Bistro
2	Vegetarian / Vegan Restaurant
3	Seafood Restaurant
4	Cocktail Bar
5	Bistro
6	Gym / Fitness Center
7	Monument / Landmark
8	Park
9	Comic Shop

4 Results section:

4.1 Discussion of the results and how they help to take a decision.

4.1.1 Examine Clusters

Now, we can examine each cluster and determine the discriminating venue categories that distinguish each cluster. Based on the defining categories, we can then assign a name to each cluster.

Cluster 1

	Neighborhood	Nearby Station	Borough	Cluster Labels	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
1	BEST WESTERN ATLANTIC HOTEL	Cairoli	Municipio 9	0	Italian Restaurant	Hotel	Café	Sandwich Place	Pizza Place	Ice Cream Shop	Japanese Restaurant	Chinese Restaurant	Cocktail Bar	Bistro
6	CROWNE PLAZA MILAN CITY	Bande Nere	Municipio 9	0	Italian Restaurant	Café	Hotel	Pizza Place	Bistro	Sandwich Place	Restaurant	Sushi Restaurant	Breakfast Spot	Gym / Fitness Center
11	HILTON MILAN	Bande Nere	Municipio 9	0	Italian Restaurant	Hotel	Café	Pizza Place	Restaurant	Sandwich Place	Japanese Restaurant	Ice Cream Shop	Sushi Restaurant	Chinese Restaurant
21	STARHOTELS ANDERSON	Cairoli	Municipio 1	0	Hotel	Café	Italian Restaurant	Pizza Place	Ice Cream Shop	Sandwich Place	Restaurant	Chinese Restaurant	Bistro	Indian Restaurant
22	STARHOTELS E. C. HO.	Cairoli	Municipio 4	0	Hotel	Café	Italian Restaurant	Pizza Place	Ice Cream Shop	Bistro	Sandwich Place	Restaurant	Indian Restaurant	Bookstore

Cluster 2

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                          Neighborhood Nearby Station      Borough  \
0                            AC MILANO       Cordusio  Municipio 5
2            BEST WESTERN HOTEL GALLES        Cairoli  Municipio 9
3   BEST WESTERN PLUS HOTEL FELICE CASATI        Cairoli  Municipio 8
5                    CRISTOFORO COLOMBO        Missori  Municipio 9
8                      ENTERPRISE HOTEL       Corvetto  Municipio 8
9                             EUROHOTEL        Missori  Municipio 4
12   HOLIDAY INN MILAN GARIBALDI STATION       Cordusio  Municipio 1
15                 NH GRAND HOTEL VERDI       Cordusio  Municipio 3
16                   NH PALAZZO MOSCOVA       Cordusio  Municipio 8
19                           SANPI HOTEL        Cairoli  Municipio 9
20              SHERATON DIANA MAJESTIC        Missori  Municipio 1
25                     UNA HOTEL CUSANI     Buonarroti  Municipio 7
26                 UNA HOTEL SCANDINAVIA       Corvetto  Municipio 9

    Cluster Labels 1st Most Common Venue 2nd Most Common Venue  \
0                1    Italian Restaurant           Pizza Place
2                1           Pizza Place    Italian Restaurant
3                1    Italian Restaurant           Pizza Place
5                1    Italian Restaurant                 Café
8                1    Italian Restaurant            Restaurant
9                1    Italian Restaurant           Pizza Place
12               1    Italian Restaurant                 Café
15               1    Italian Restaurant            Restaurant
16               1    Italian Restaurant            Restaurant
19               1    Italian Restaurant                 Café
20               1    Italian Restaurant           Pizza Place
25               1    Italian Restaurant                 Plaza
26               1    Italian Restaurant           Pizza Place

   3rd Most Common Venue          4th Most Common Venue 5th Most Common Venue  \
0                   Café                     Restaurant          Cocktail Bar
2        Ice Cream Shop                          Hotel                 Café
3                  Hotel                          Café          Cocktail Bar
5            Pizza Place  Vegetarian / Vegan Restaurant                Hotel
8                  Hotel              Basketball Court    Seafood Restaurant
9                   Café  Vegetarian / Vegan Restaurant                Hotel
12                   Pub                Ice Cream Shop    Seafood Restaurant
15           Pizza Place                          Hotel          Cocktail Bar
16           Pizza Place                Ice Cream Shop          Cocktail Bar
19                 Hotel                   Pizza Place          Cocktail Bar
20                  Café                        Bistro    Seafood Restaurant
25       Ice Cream Shop                          Hotel                 Café
26           Restaurant                          Café   Japanese Restaurant

   6th Most Common Venue 7th Most Common Venue 8th Most Common Venue  \
0    Japanese Restaurant               Bistro               Bakery
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2	Cocktail Bar	Sandwich Place	Bakery
3	Ice Cream Shop	Bar	Clothing Store
5	Seafood Restaurant	Clothing Store	Bakery
8	Health Food Store	Mexican Restaurant	Diner
9	Seafood Restaurant	Bakery	Gay Bar
12	Cocktail Bar	Pizza Place	Ramen Restaurant
15	Ice Cream Shop	Plaza	Steakhouse
16	Café	Hotel	Bookstore
19	Clothing Store	Ice Cream Shop	Bar
20	Cocktail Bar	Bakery	Hotel
25	Theater	Pizza Place	Wine Bar
26	Seafood Restaurant	Ice Cream Shop	Sushi Restaurant

	9th Most Common Venue	10th Most Common Venue
0	Bookstore	Plaza
2	Japanese Restaurant	Vegetarian / Vegan Restaurant
3	Vegetarian / Vegan Restaurant	Seafood Restaurant
5	Ice Cream Shop	Bistro
8	Nightclub	Park
9	Bistro	Comic Shop
12	Bakery	Japanese Restaurant
15	Piadineria	Seafood Restaurant
16	Plaza	Seafood Restaurant
19	Vegetarian / Vegan Restaurant	Art Gallery
20	Gay Bar	Vegetarian / Vegan Restaurant
25	Bakery	Gift Shop
26	Hotel	Chinese Restaurant

Cluster 3

	Neighborhood	Nearby Station	Borough	Cluster Labels
4	BRUNELLESCHI	Istria	Municipio 6	2
7	DE LA VILLE	Istria	Municipio 6	2
13	HOTEL MILANO SCALA	Istria	Municipio 2	2
14	MANIN	Missori	Municipio 1	2
18	ROOM MATE GIULIA	Istria	Municipio 3	2
23	STARHOTELS ROSA GRAND	Istria	Municipio 3	2
24	STRAF	Istria	Municipio 1	2

	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue
4	Hotel	Italian Restaurant	Pizza Place
7	Italian Restaurant	Boutique	Plaza
13	Italian Restaurant	Plaza	Hotel
14	Boutique	Hotel	Italian Restaurant
18	Italian Restaurant	Pizza Place	Ice Cream Shop
23	Italian Restaurant	Hotel	Clothing Store
24	Italian Restaurant	Plaza	Hotel

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   4th Most Common Venue 5th Most Common Venue 6th Most Common Venue  \
4         Ice Cream Shop                 Café          Burger Joint
7                  Hotel       Clothing Store          Cocktail Bar
13        Ice Cream Shop              Theater   Monument / Landmark
14                 Café                Plaza                  Park
18                 Hotel               Plaza          Cocktail Bar
23                 Plaza             Boutique          Cocktail Bar
24        Ice Cream Shop       Clothing Store           Pizza Place

   7th Most Common Venue 8th Most Common Venue 9th Most Common Venue  \
4           Gourmet Shop          Dessert Shop                 Plaza
7         Ice Cream Shop         Women's Store          Dessert Shop
13                 Café            Restaurant            Art Museum
14        Clothing Store         Women's Store           Men's Store
18                 Café          Gourmet Shop   Monument / Landmark
23           Pizza Place       Ice Cream Shop             Bookstore
24          Cocktail Bar       Sandwich Place                  Café

   10th Most Common Venue
4            Cocktail Bar
7     Monument / Landmark
13              Gift Shop
14                    Gym
18             Coffee Shop
23             Coffee Shop
24                  Bakery
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Cluster 4

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           Neighborhood Nearby Station      Borough  Cluster Labels  \
17  RAMADA PLAZA MILANO       Crocetta  Municipio 2               3

   1st Most Common Venue 2nd Most Common Venue 3rd Most Common Venue  \
17    Italian Restaurant           Pizza Place        Sandwich Place

   4th Most Common Venue 5th Most Common Venue 6th Most Common Venue  \
17                  Park                  Pool           Event Space

   7th Most Common Venue 8th Most Common Venue 9th Most Common Venue  \
17                   Spa                  Café           Music Venue

   10th Most Common Venue
17     Chinese Restaurant
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Cluster 5

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                    Neighborhood Nearby Station      Borough  Cluster Labels  \
10  HILTON GARDEN INN MILANO NORD    Monumentale  Municipio 7               4

   1st Most Common Venue 2nd Most Common Venue 3rd Most Common Venue  \
10    Italian Restaurant               Theater            Restaurant

   4th Most Common Venue 5th Most Common Venue 6th Most Common Venue  \
10                Office                 Hotel        Cosmetics Shop

   7th Most Common Venue 8th Most Common Venue 9th Most Common Venue  \
10           Pizza Place        Ice Cream Shop           Snack Place

   10th Most Common Venue
10           Climbing Gym
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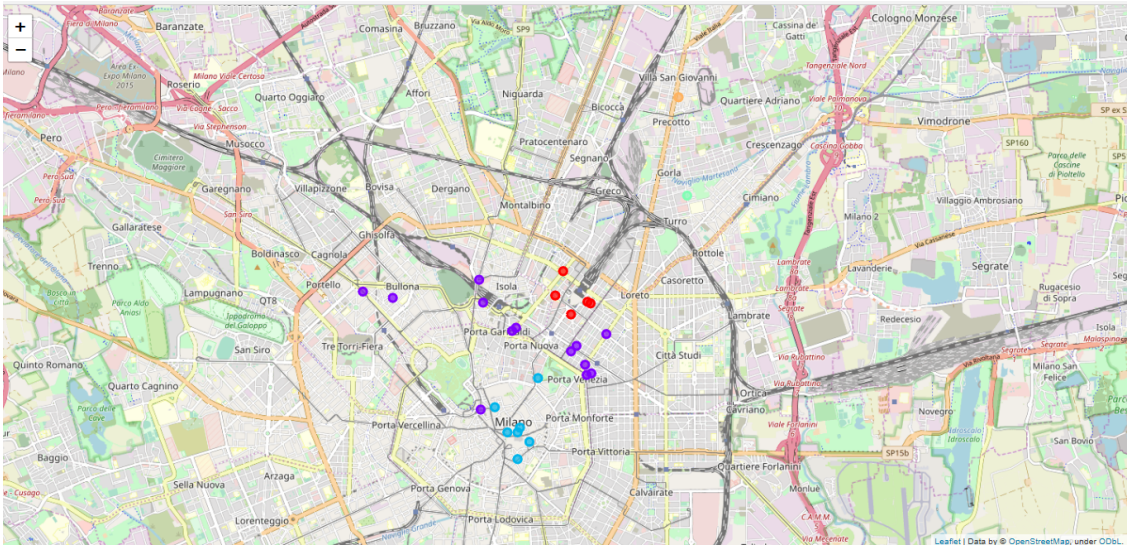

5 Discussion section:

5.1 Elaboration and discussion on any observations and/or recommendations for improvement.

The analysis shows that although there is a great number of high quality hotels in Milan, there are pockets of 2-4 star rating hotels fairly close to subway stations. In first cluster, highest concentration of such hotels was detected in Municipio (Borough) 9, with Italian restaurant as the 1st most common venue, and Café and Pizza Place as the next common venues. Although these hotels are far from city center, but they are fairly close to subway stations which allow easy transport. Moreover, they can provide 625 rooms to accommodate all IF+OCOG Stakeholder Group of Winter Games 2026. Another cluster was identified as potentially interesting (cluster 1), which are distributed around the boroughs 1, 3, 4, 7, 8, 9, and have enough capacity to accommodate

the mentioned group. Also this cluster are far from city center, but are fairly close to subway stations to allow easy transportation. Hotels clustered in Cluster 2, are closer to city center and distributed around boroughs 1, 2, 3 and 6. Obviously, these are closer to monuments-landmarks in Milan and the places worthable to visit. Recommended clusters should be considered only as a starting point for more detailed analysis which could eventually result in location which has not only no nearby competition but also other factors taken into account and all other relevant conditions met. Results are containing largest number of potential hotel locations based on distance to subway station and number of existing venues around them. This, of course, does not imply that those are actually optimal locations to accommodate all IF+OCOG Stakeholder Group of Winter Games 2026! This analysis provide a proposed list of hotels. To submit the plan for accommodation, more accommodation requirements should be covered according to IOC Host City Contract. The IOC will choose, after an inspection visit, one or several hotels to become the OFH, thus covering its accommodation requirements.

6 Conclusion section:

Purpose of this project was to identify Milan Hotels close to a subway station with most venues and amenities in their neighborhoods (particularly Italian restaurants) in order to aid IOC administration in narrowing down the search for optimal location for accommodating all IF+OCOG Stakeholder Group of Winter Games 2026. I have first identified hotels that satisfy some basic requirements, then by finding closest subway station to each hotel using Nominatim API, venues density distribution from Foursquare data, I generated extensive collection of location that justify further analysis. Clustering of those locations was then performed in order to create major locations of interest (containing greatest number of potential locations) and name and addresses of those hotels were created to be used as starting points for final exploration by IOC stakeholders.

Final decision on optimal accommodation location will be made by IOC stakeholders based on more accommodation requirements which should be covered according to IOC Host City Contract.