COURSERA

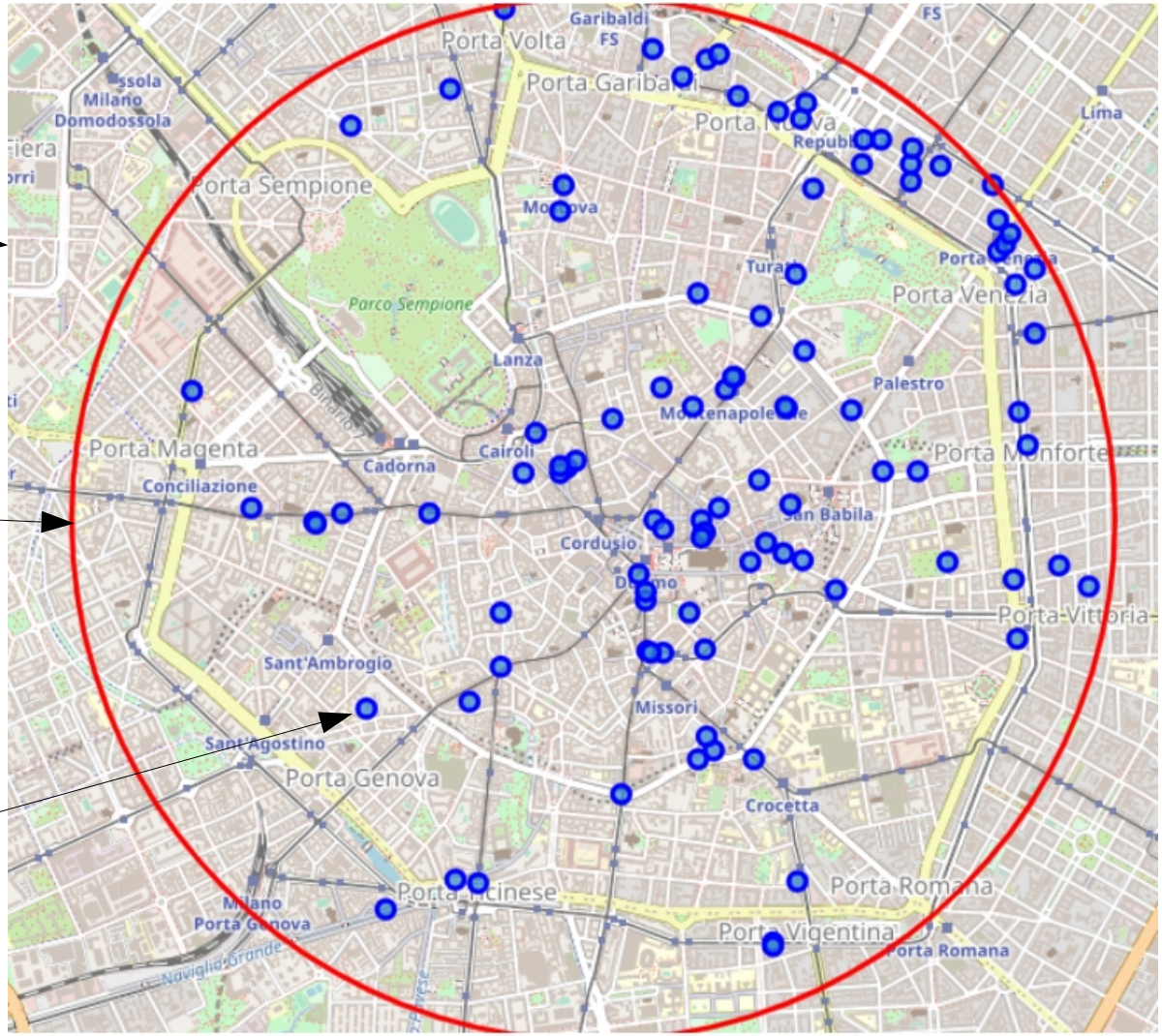
Applied data science capstone

PROBLEM CONTEXT

Milano city...

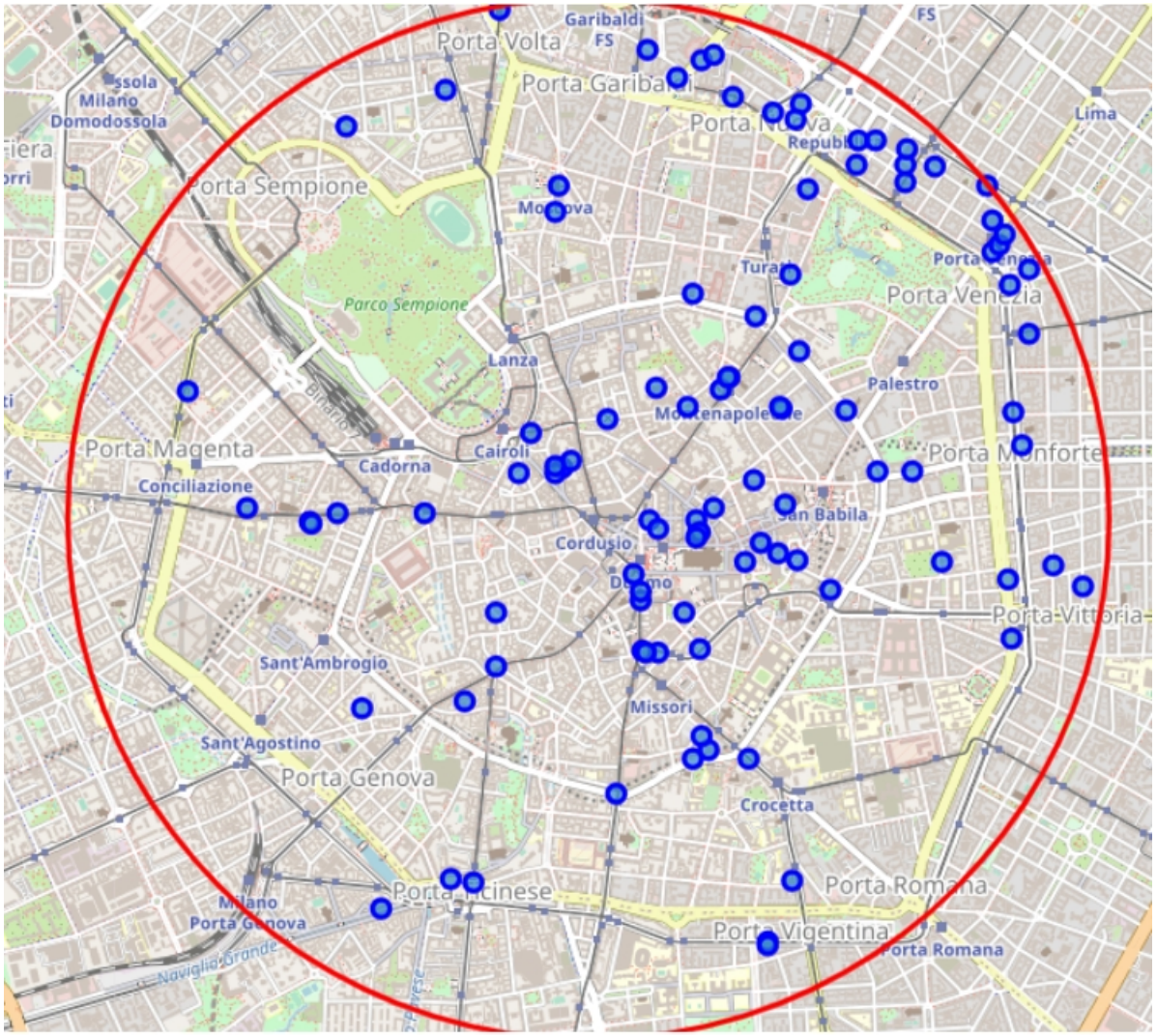
Very city center...

Hotels in the city...



PROBLEM FORMULATION

Where is the best place to set the headquartier for a taxi company serving all the hotels ?



METHODOLOGY

	name	categories	lat	lng
0	Park Hyatt Milan	Hotel	45.465532	9.188911
1	Room Mate Giulia Hotel	Hotel	45.465250	9.189396
2	BVLGARI Hotel Milano	Hotel	45.470149	9.189318
3	Mandarin Oriental	Hotel	45.469461	9.190876
4	Armani Hotel Milano	Hotel	45.470478	9.192882
5	Starhotels Rosa Grand	Hotel	45.464122	9.193692
6	Four Seasons Hotel Milano	Hotel	45.469372	9.195466
7	The Square	Hotel	45.461003	9.189338
8	HMS Hotel Milano Scala	Hotel	45.469061	9.186865
9	Hotel Spadari al Duomo	Hotel	45.463738	9.187130

Having latitude and longitude coordinates (Hx,Hy) of the hotels (i) we can define the average distance for a point (x,y) as

$$d = \frac{1}{N} \sum_{i}^{N} \sqrt{(x - H_x^i)^2 + (y - H_y^i)^2}$$

SOLUTION

- Use Python's libriary SciPy to solve the optimization problem of finding the coordinates x and y that minimizes the distance d.

```
Optimization terminated successfully.
The optimal position coordinates are [45.46756174  9.19235717]
The minimum average distance is 1102.48 meters
The centered average distance is 1262.73 meters
The minimum average travelling time @10km/h is 7.0 minutes
The maximum distance is 2628.9 meters
The minimum distance is 160.11 meters
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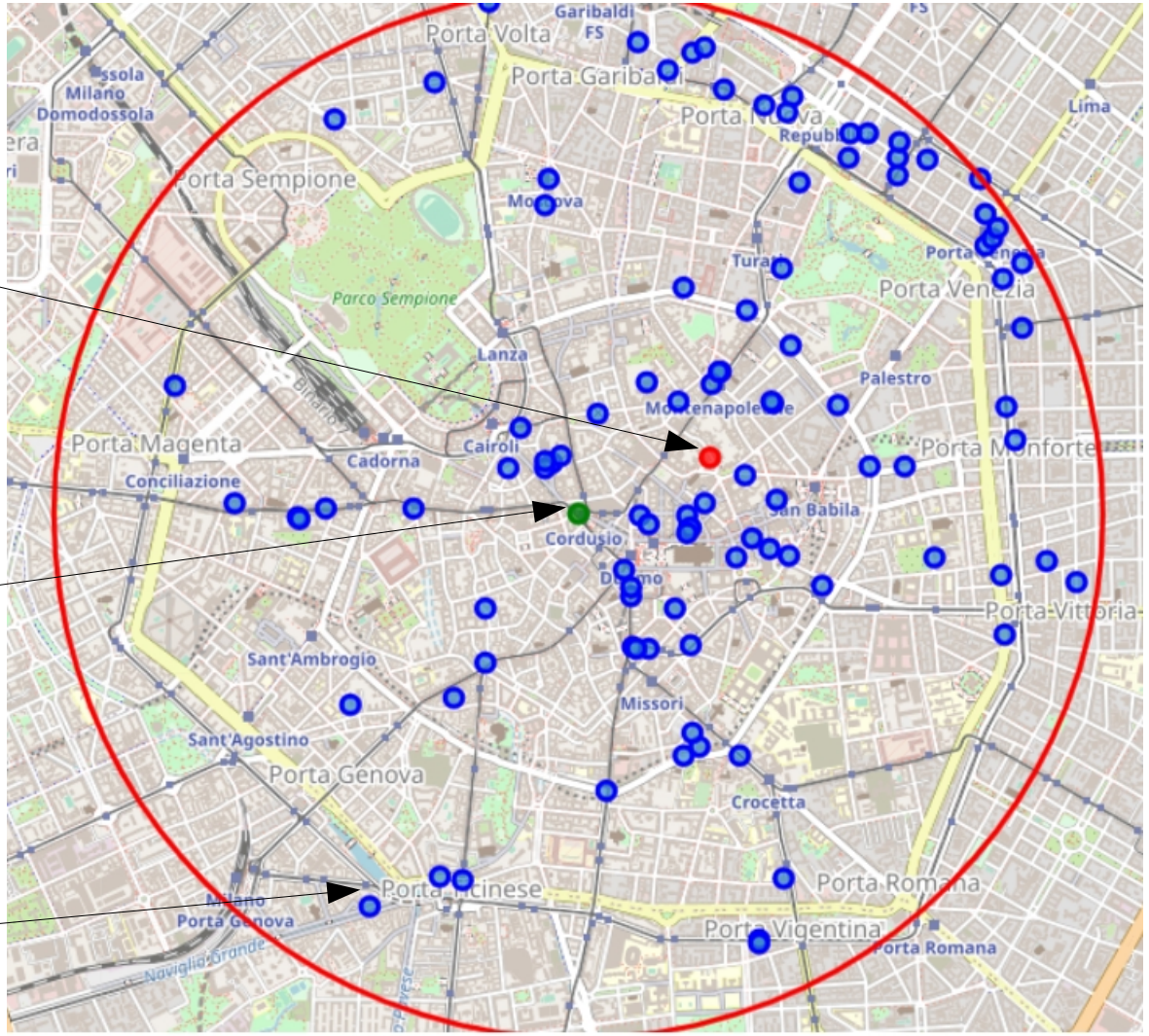
RESULTS

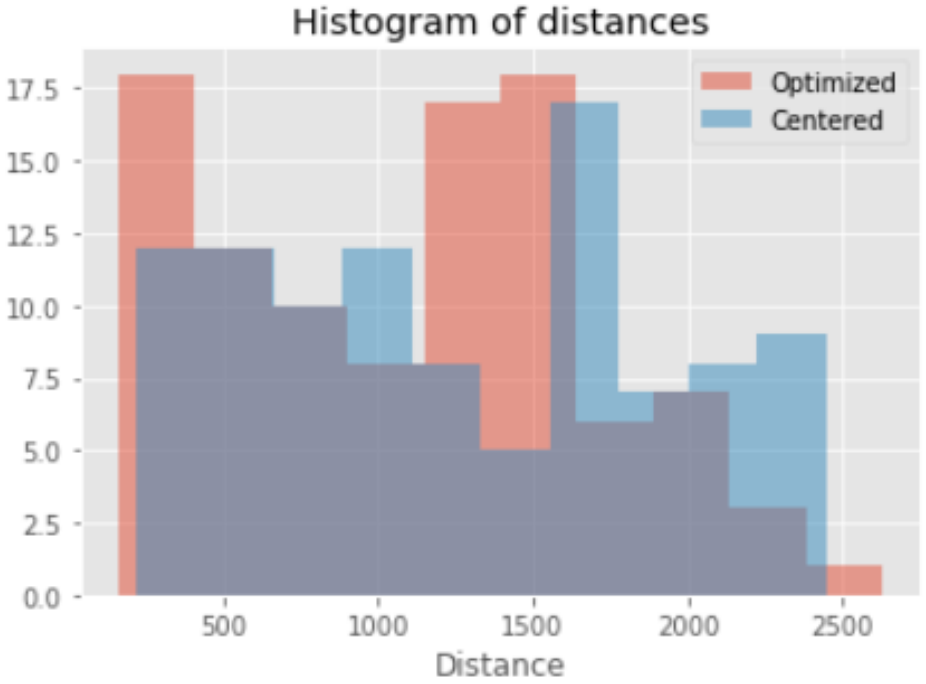
Optimal location

Geographical center...

Hotels in the city...



DISCUSSION



It is possible to find the best position for serving all the hotels in the city decrising the average distance about 10%.