

The background image is a wide-angle photograph of the Moscow skyline at sunset. In the foreground, the red brick towers of the Moscow Kremlin are visible, with the Spasskaya Tower prominently featuring a red star on its roof. Behind the Kremlin, a dense cluster of modern glass skyscrapers rises against a sky filled with orange and yellow clouds. The sun is low on the horizon, creating a strong backlight effect. In the bottom left corner, there is a small orange rectangular graphic element.

# IBM Data Science Capstone

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**Construction of a European Fine  
Dining Restaurant in Moscow,  
Russia**





# Fine Dining: A Definition

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- Fine dining restaurants are a very high class of restaurants which feature prominent décor made of high-quality materials, high prices on the food, and an etiquette that must be followed by staff and visitors alike.
- Fine dining has been around since the late 18th century and is very popular in Western Europe and parts of North America.

# Business Problem Definition



- This project will focus on a restaurateur trying to open a high-end fine dining restaurant in Moscow, Russia.
- The city districts will be clustered into groups
- The best group should be one that has many gastronomical venues and plenty of sources of fresh ingredients, thus maximizing revenue and minimizing costs on food

# Data Sources

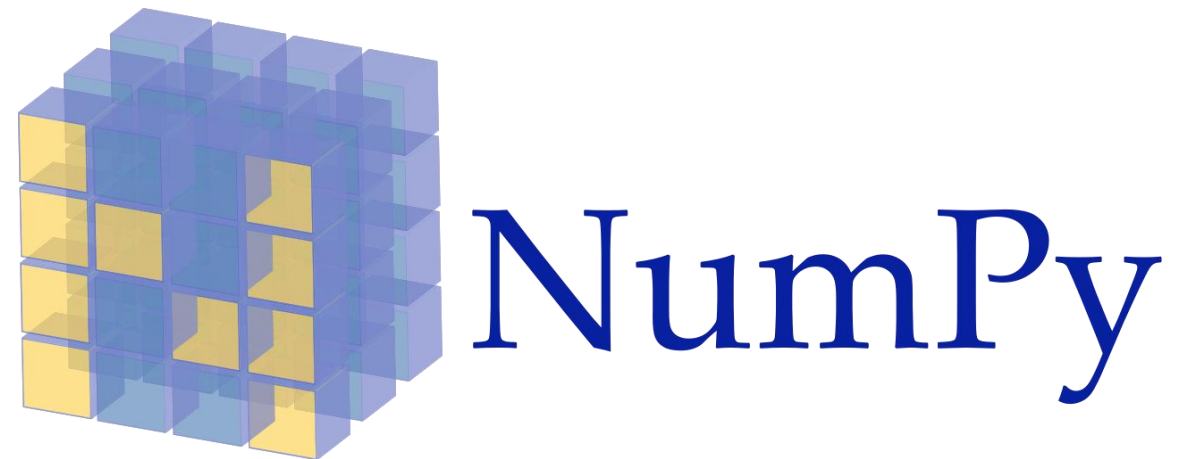
- Our source of data is the following Wikipedia page: [https://en.wikipedia.org/wiki/Category:Districts\\_of\\_Moscow](https://en.wikipedia.org/wiki/Category:Districts_of_Moscow)
- We will also use geocoder to get geocoordinate data and Foursquare to get venue information



**FOURSQUARE**

# Data Processing Tools

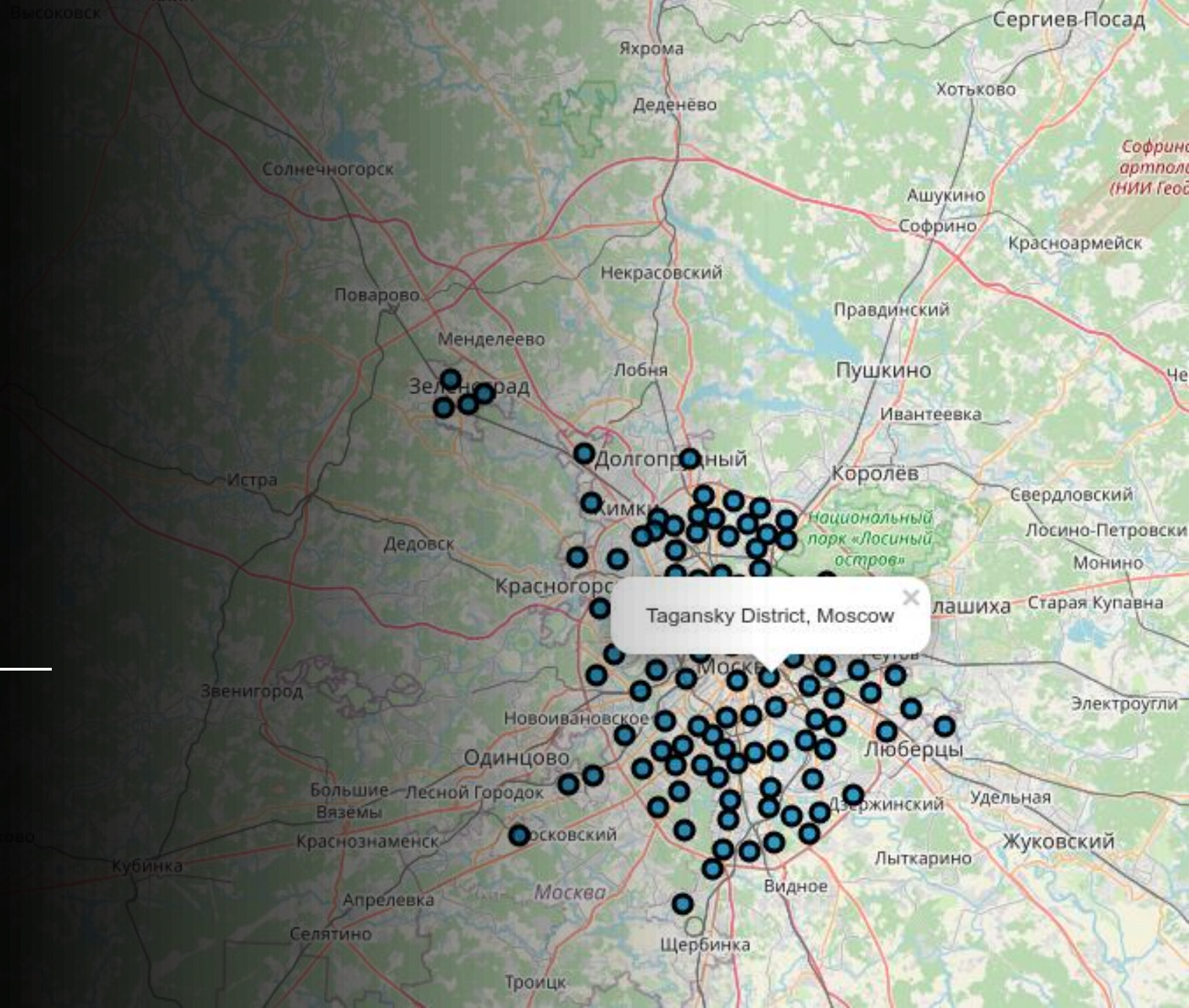
- We will use Pandas to parse and store the data
- NumPy will be used to perform some operations on the data
- We will use Scikit-Learn to analyse it by using the K-means algorithm





# Districts of Moscow

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## The result of clustering the districts of Moscow into 11 Different districts

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# Clustered District DataFrames

Some resulting DataFrames after clustering

[401]: # Cluster 2 cluster_1 = moscow_final_df.loc[moscow_final_df['label'] == 1, moscow_final_df.columns[list(range(2, moscow_final_df.shape[1]))]] cluster_1[0:20]																		
[401]:	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	11th Most Common Venue	12th Most Common Venue	13th Most Common Venue	14th Most Common Venue	15th Most Common Venue	label	District	
	26	Sushi Restaurant	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Escape Room	Food & Drink Shop	Food Court	Forest	Fountain	1	Golyanovo District
	37	Sushi Restaurant	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Escape Room	Food & Drink Shop	Food Court	Forest	Fountain	1	Krasnoselsky District
	110	Sushi Restaurant	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Escape Room	Food & Drink Shop	Food Court	Forest	Fountain	1	Vykhino-Zhulebino District
	284	Sushi Restaurant	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Escape Room	Food & Drink Shop	Food Court	Forest	Fountain	1	NaN
	286	Sushi Restaurant	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Escape Room	Food & Drink Shop	Food Court	Forest	Fountain	1	NaN
	478	Sushi Restaurant	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Escape Room	Food & Drink Shop	Food Court	Forest	Fountain	1	NaN
	524	Sushi Restaurant	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Escape Room	Food & Drink Shop	Food Court	Forest	Fountain	1	NaN
	571	Sushi Restaurant	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Escape Room	Food & Drink Shop	Food Court	Forest	Fountain	1	NaN
[407]: # Cluster 8 cluster_8 = moscow_final_df.loc[moscow_final_df['label'] == 7, moscow_final_df.columns[list(range(2, moscow_final_df.shape[1]))]] cluster_8[0:20]																		
[407]:	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	11th Most Common Venue	12th Most Common Venue	13th Most Common Venue	14th Most Common Venue	15th Most Common Venue	label	District	
	11	Cosmetics Shop	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Escape Room	Food & Drink Shop	Food Court	Forest	Fountain	7	Bogorodskoye District
	31	Cosmetics Shop	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Escape Room	Food & Drink Shop	Food Court	Forest	Fountain	7	Khoroshyovskiy District
	63	Cosmetics Shop	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Escape Room	Food & Drink Shop	Food Court	Forest	Fountain	7	Novo-Peredelkino District
	113	Cosmetics Shop	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Escape Room	Food & Drink Shop	Food Court	Forest	Fountain	7	Yasenevo District
	118	Cosmetics Shop	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Escape Room	Food & Drink Shop	Food Court	Forest	Fountain	7	Zapadnoye Degunino District
[413]: # Cluster 1 cluster_0 = moscow_final_df.loc[moscow_final_df['label'] == 0, moscow_final_df.columns[list(range(2, moscow_final_df.shape[1]))]] cluster_0[0:5]																		
[413]:	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	11th Most Common Venue	12th Most Common Venue	13th Most Common Venue	14th Most Common Venue	15th Most Common Venue	label	District	
	1	Health Food Store	Zoo Exhibit	Film Studio	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Fish Market	Escape Room	Flower Shop	Food & Drink Shop	Food Court	Forest	Fountain	0	Akademicheskoye District
	2	Liquor Store	Film Studio	Event Space	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Fish Market	Frozen Yogurt Shop	Flower Shop	Food & Drink Shop	Food Court	Forest	Fountain	0	Alexeyevskiy District
	4	Convenience Store	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Escape Room	Food & Drink Shop	Food Court	Forest	Fountain	0	Babushkinskiy District
	5	Pet Store	Film Studio	Event Space	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Fish Market	Czech Restaurant	Flower Shop	Food & Drink Shop	Food Court	Forest	Fountain	0	Basmanny District
	6	Salon / Barbershop	Zoo Exhibit	Fast Food Restaurant	Event Space	Exhibit	Fabric Shop	Farm	Farmers Market	Film Studio	Electronics Store	Fish Market	Flower Shop	Food & Drink Shop	Food Court	Forest	0	Begovoy 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	11th Most Common Venue	12th Most Common Venue	13th Most Common Venue	14th Most Common Venue	15th Most Common Venue	label	District	
	14	Bakery	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Food & Drink Shop	Food Court	Forest	Fountain	French Restaurant	10	Chertanovo Severnoye District
	27	Bakery	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Food & Drink Shop	Food Court	Forest	Fountain	French Restaurant	10	Ivanovskoye District
	30	Bakery	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Food & Drink Shop	Food Court	Forest	Fountain	French Restaurant	10	Khoroshyovo-Mnyovniki District
	53	Bakery	Zoo Exhibit	Fish Market	Exhibit	Fabric Shop	Farm	Farmers Market	Fast Food Restaurant	Film Studio	Flower Shop	Food & Drink Shop	Food Court	Forest	Fountain	French Restaurant	10	Metroporodok District






# Conclusion

- Based on the above results, the best cluster of districts would be **CLUSTER NUMBER 2** due to a high amount of expensive sushi restaurants that would guarantee wealthy clientele as well an abundance of food sources such as farms



# References

- Pandas Documentation: <https://pandas.pydata.org/pandas-docs/stable/index.html>
  - Scikit Learn Documentation: [https://scikit-learn.org/stable/auto\\_examples/cluster/plot\\_kmeans\\_silhouette\\_analysis.html](https://scikit-learn.org/stable/auto_examples/cluster/plot_kmeans_silhouette_analysis.html)
  - Silhouette Analysis: [https://scikit-learn.org/stable/auto\\_examples/cluster/plot\\_kmeans\\_silhouette\\_analysis.html](https://scikit-learn.org/stable/auto_examples/cluster/plot_kmeans_silhouette_analysis.html)
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Thank you!