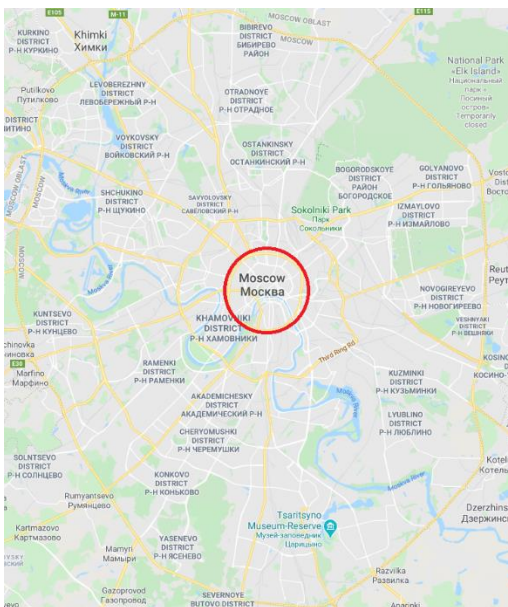


Investor Dilemma – Final Report

There are many cafes and restaurants around Moscow city center.



As a potential investor, we will be looking at the restaurants and cafes across Moscow city center. We will explore the best locations for Italian (“pizza”), Japanesees (“sushi”) and Russian cuisine (“Russian”) restaurants across the city center of Moscow. As one may discover from many reports and papers, [Moscow](#) is the capital of Russian Federation with more than 12.5 million residents living within city limits. Primary industries in Moscow include the chemical, metallurgy, **food**, textile, furniture, energy production, software development and machinery industries. We will be discovering the best restaurants clusters across Moscow city center, and will attempt to answer several questions:

- For Italian (“pizza”), Japanesees (“sushi”) and Russian cuisine (“Russian”):
 - Where are the best restaurants located?
 - Which restaurant (of which cuisine type) are the most popular?
- Based on the results of previous questions:
 - Where an investor should open a restaurant, and of which cuisine type?

Data

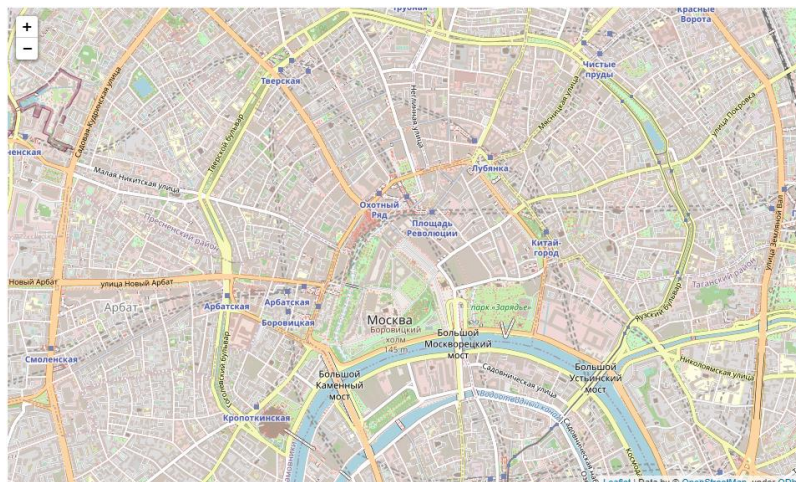
In order to answer the above questions, the data of Moscow city center will include city center point (latitude & longitude), restaurants, restaurant ratings, tips and likes.

Moscow geodata containing the city center point (latitude & longitude) will be obtained from the public data:

<https://en.wikipedia.org/wiki/Moscow>

All data related to locations (restaurants, cafes) and the respective venues restaurants by cuisine type will be obtained via the FourSquare API utilized via the [request](#) library in Python.

Let's first draw a map of a region of our interest:



We then define some helper functions to fill the dataframes. There will be three dataframes: for Italian places, for Japanese places and for Russian places. Let's see the raw data after getting it from Foursquare APIs:

Italian ("pizza"):

	ID	Name	Category	Short	LAT	LON	Likes	Rating	Tips
0	59be341a9cadd90e7e05adbc	Camorra Pizza e Birra	Pizza Place	Pizza	55.755135	37.636913	962	7	0.785356
1	546e146b498e86d7178d336d	Pinzeria by Bontempi	Pizza Place	Pizza	55.746038	37.602141	346	9	0.593781
2	59dcac56da2e0054b468441e	Il Pizzaiolo	Pizza Place	Pizza	55.756817	37.621677	688	7	0.982949
3	59a01396037be1415cee1310	Pinsa Maestrello	Pizza Place	Pizza	55.758779	37.645721	378	1	0.785356
4	5a366203838e5972571a9eed	Pinzeria by Bontempi	Pizza Place	Pizza	55.766728	37.624124	345	5	0.003009

Japanese ("sushi"):

	ID	Name	Category	Short	LAT	LON	Likes	Rating	Tips
0	51cefa43498ebe6beaa060d9	Novikov	Asian Restaurant	Asian	55.757512	37.612967	638	6	0.864322
1	5ba3a67ead910e002c645e8c	Ки-До	Sushi Restaurant	Sushi	55.747378	37.597697	698	6	0.467337
2	57c027d7498e8532054695f3	Corner Café & Kitchen	Japanese Restaurant	Japanese	55.751496	37.586757	106	7	0.416080
3	59248954a4ba7c7d5af54ff4	Buba by Sumosan	Sushi Restaurant	Sushi	55.769191	37.620782	426	9	0.997990
4	5adc8a6dde7701e6bd89ba4	Shiba	Japanese Restaurant	Japanese	55.763537	37.597078	382	6	0.645226

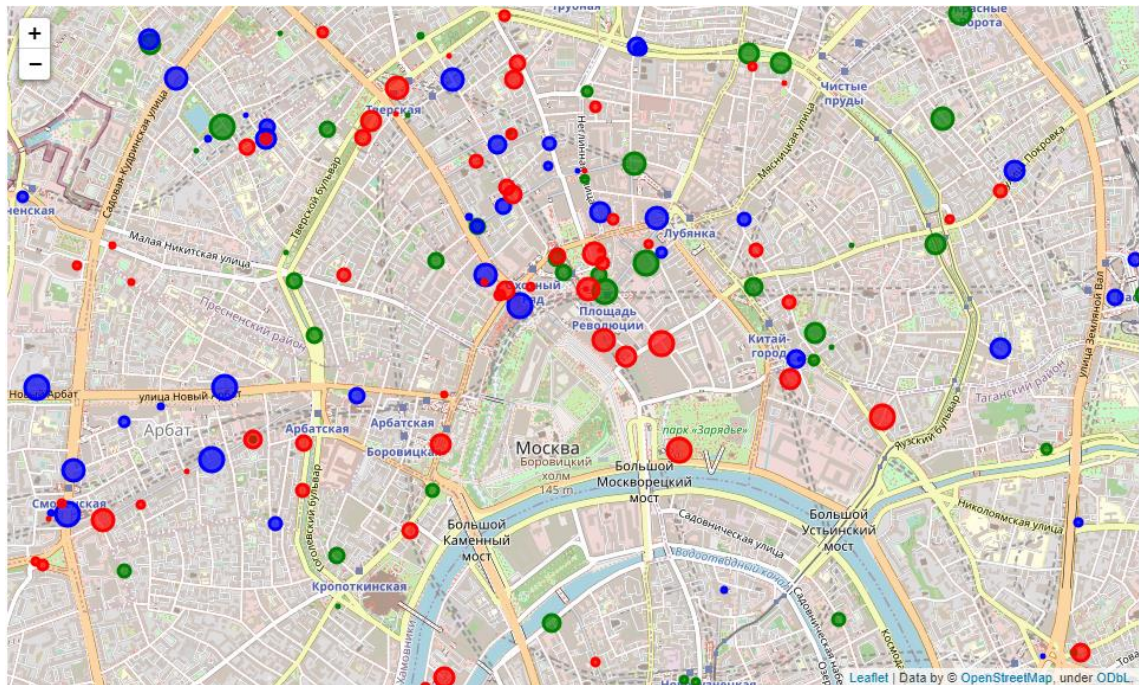
Russian ("rus"):

	ID	Name	Category	Short	LAT	LON	Likes	Rating	Tips
0	541c4b83498e3fbc997f2c61	Dr. Zhivago (Dr. Zhivago (Dr. Живаго))	Russian Restaurant	Russian	55.756882	37.614406	464	9	0.728370
1	4b48b273f964a5202a5326e3	Cafe Pushkin (Кафе Пушкинъ)	Russian Restaurant	Russian	55.763797	37.604698	770	1	0.818913
2	4de4c0083151aec9e5cd2f25	Mari Vanna (Мари Vanna)	Russian Restaurant	Russian	55.762697	37.595644	617	5	0.597586
3	5873b35702b60e3b699f05bb	Beluga (Белуга)	Russian Restaurant	Russian	55.756685	37.614032	571	4	0.356137
4	4dccf84eb0fb25f6e31e3408	Ресторан «Сандуны»	Russian Restaurant	Russian	55.764381	37.620988	420	1	0.396378

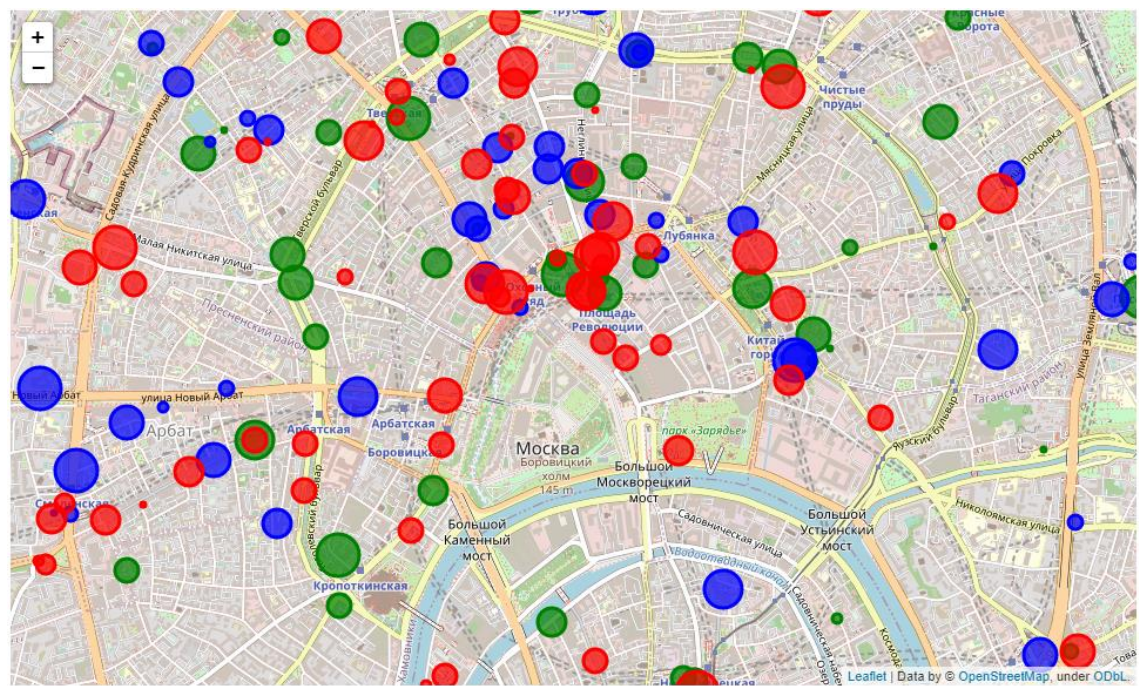
We found a hundred places of each type and filled venue likes, rating and Tips. Since the 'Tips' column contained data of a different scale, we have normalized it from 0 to 1.

Let's visualize venues on a map. Note: here and below green color represents "pizza", blue color represents "sushi" and red color represents "Russian".

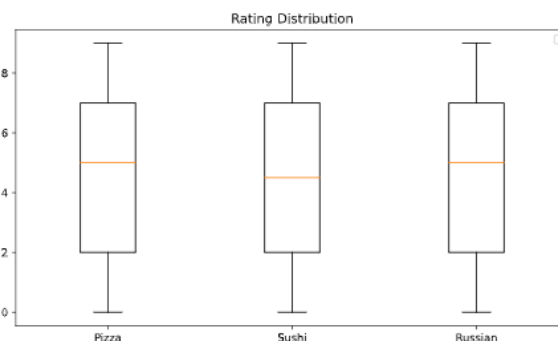
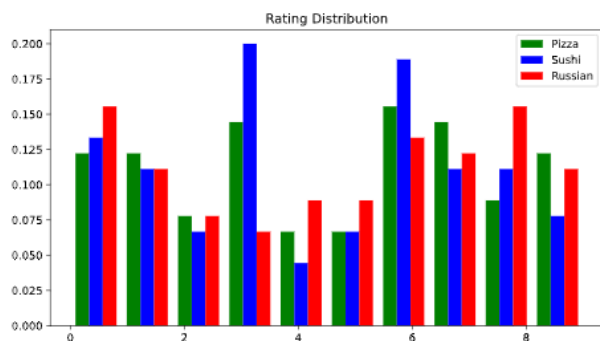
The following map contains a distribution of tips per venue in a normalized scale:



The following map contains a distribution of ratings per venue:



Let's also see the parameters distribution on plots. For ratings we have:

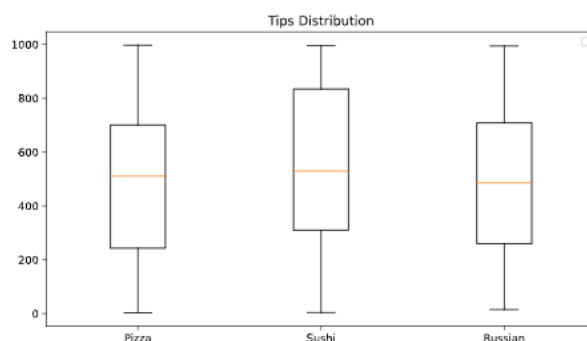
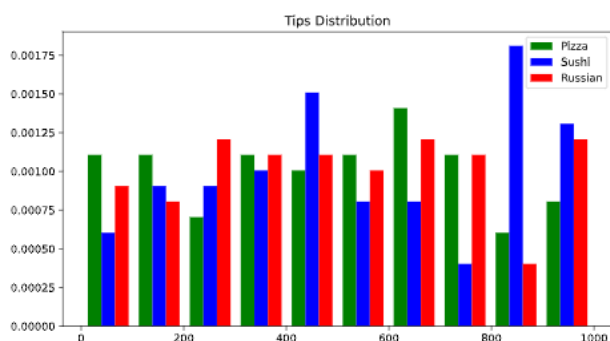


Average rating for pizza = 4.56

Average rating for sushi = 4.37

Average rating for Russian = 4.65

For tips we have:



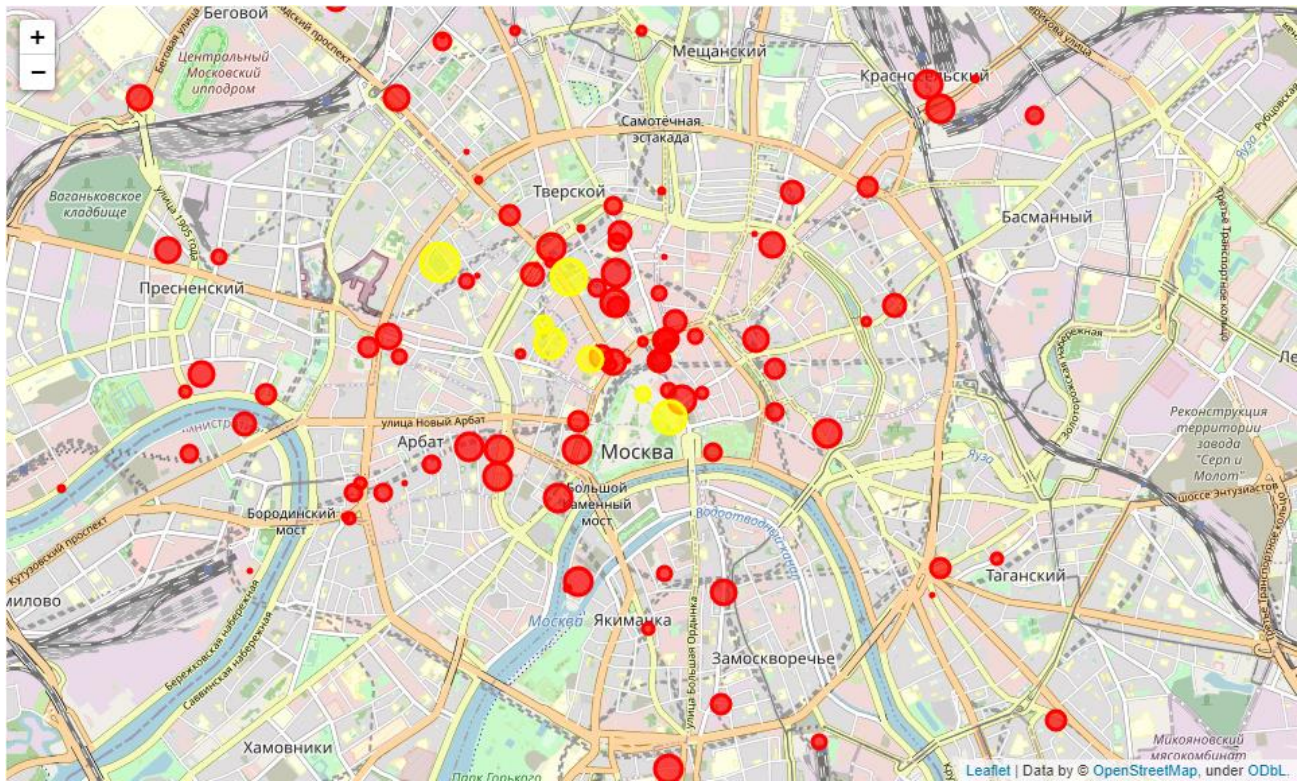
Average tips for pizza = 486.69

Average tips for sushi = 549.84

Average tips for Russian = 496.86

So from the map we see that average tips are based on the distance from the city center (the far – the less). Based on ratings, investor should prefer Russian cuisine. It is also obvious that foreign tourists visiting city center would prefer Russian cuisine, rather than Italian or Japanese.

So we finally cluster the results for Russian places into 7 clusters using K-Means to see the best places to open a Russian restaurant.



Russian restaurants with their ratings are marked red in the picture. Yellow rounds represent clusters. We see that the best places are near the city center and near the Boulevard ring, where many cafes/restaurants are located, and many known tourist routes are also exist.