COURSERA CAPSTONE PROJECT – THE BATTLE OF NEIGHBORHOODS

MOSCOW FLATS

**INTRODUCTION**

This project will help people who want to buy a one- or two-room flat in Moscow to find the district which will match their personal needs and lifestyle. From this study you can see:

* + Which districts have lower flat prices and what is an average price per square meter in each district
  + What venues are most popular in each district, which can help you choose the district that matches preferences
  + You can see which other districts in Moscow have the same infrastructure as your preferable one, so you can widen your search and find truly the best option

**DATA**

The data on the flats' sizes, prices, number of rooms and addresses was collected by scrapping one of the most popular local websites with apartment listings - CIAN. Using Yandex API, the coordinates for each flat were found (as the addresses on the local apartments website are in Russian, Yandex gave more accurate results than geopy). Then, the data on the closest venues (parks, cafes, hotels, gyms, supermarkets, etc.) for each district was collected using the Foursquare API.

**METHODOLOGY**

As a first step, I scraped the data (price, number of rooms, size and address) from local apartment listings website CIAN for the one- and two-room flats in Moscow using the BeautifulSoup package and put the data into the below Pandas data frame:

Machine generated alternative text:
[27] : 
[271 : 
flats . head() 
o 
2 
3 
4 
Price 
28 000 000 
5 392 000 
7 891 540 P 
5 406 652 
105 000 000 
Rooms 
2 
2 
2 
Size 
56 M2 
16 
63,8 M2 
35,6 M2 
109,9 M2 
Town 
Mocca 
Mocca 
Mocca 
Mocca 
Mocca 
Region 
uA0 
uA0 
YOBAO 
YOBAO 
uA0 
District 
p H [IpecHeHcK',1V1 
p-H Sacrv1aHHSM 
p-H He.«pac03Ka 
p-H He.«pac03Ka 
p H TeepcKoV1 
Street 
-VI npoe3A 
CTap0Kvtp0VH81V1 nep. 
Y". Jlaap',1HeHK0 
yn. BePToneTWIK03 
2-9 Speac.«aR yn. 
House 
22c2 
6 
3 
4 
6 

I have also added a calculated price per square meter column to compare prices across districts:

Machine generated alternative text:
[186] : 
c 186] : 
# calculate the price per meter squared 
df['Price/m2'] = 
(df[ 'Price' 'Size' ] ) . round(2) 
df. head() 
Unnamed: O 
2 
3 
4 
o 
2 
3 
4 
Price 
28000000.0 
5392000.0 
7891540.0 
5406652.0 
105000000.0 
Rooms 
2.0 
1.0 
2.0 
1.0 
2.0 
Size 
56.0 
16.0 
63.8 
35.6 
109.9 
Town 
Mocca 
Mocca 
Mocca 
Mocca 
Mocca 
Region 
uA0 
uA0 
YOBAO 
YOBAO 
uA0 
District 
p H [IpecHeHcK',1V1 
p-H Sacrv1aHHSM 
p-H He.«pac03Ka 
p-H He.«pac03Ka 
p H TeepcKoV1 
Street 
-VI npoe3A 
Crapo«p0VH8M nep. 
Y". Jlaap',1HeHK0 
yn. BePToneTWIK03 
2-9 Speac.«aR yn. 
House 
22c2 
6 
3 
4 
6 
Price/m2 
500000.00 
337000.00 
123691.85 
151872.25 
955414.01 

After removing all outliers, which you can see on the plot below, we got a final data set of 1178 flats.

Machine generated alternative text:
< seaborn .axisgrid. JointGrid at ax7f671abaeIda> 
25 
50 
75 
100 
125 
150 
175 
200 

From the boxplot below you can see how the price per square meter is distributed among Moscow regions. The first one is the central part of Moscow. Troytsky region has the lowest price per square meter - it is a part of 'New Moscow' and was united to Moscow only a couple of years ago.

Machine generated alternative text:
600000 
500000 
E 400000 
300000 
200000 
100000 
Region 

Using the Yandex API I found the coordinates for each flat and each district of the flats from the analyzed dataset:

Machine generated alternative text:
# Lets create a dataframe 
with flats data and their district coordinates to find al [ venues nearby 
1.0 
1.0 
1.0 
1.0 
full data = pd . right—distr coordinates, how: ' left ' , 
left on: 'District' , 
right on: ' District' ) 
full data.head() 
Unnamed: 
Price 
o 
28000000.0 
5392000.0 
3 
5406652.0 
5 
5656010.0 
6 
5743766.0 
Rooms 
2.0 
Size 
56.0 
16.0 
35.6 
38.5 
39.1 
Town 
Mocca 
Mocca 
Mocca 
Mocca 
Mocca 
Region 
QAO 
QAO 
F08A0 
F08A0 
F08A0 
District 
n pecHeHcK'•u7 
SacMaHHS117 
HeKpacoaKa 
HeKpacoaKa 
HeKpacoaKa 
Street 
KpacHoraapae17cK'•u7 
npoe3A 
CrapoK/p0UHb117 
nep. 
yn. aepToneT'4L4K0B 
Flasp'4HeHK0 
yn. aepToneT'4L4K0B 
House 
22c2 
6 
4 
5 
13 
Price/m2 
500000.00 
337000.00 
151872.25 
146909.35 
146899.39 
Address 
Mocca 1-'7 
KpacHoraapae17cK'•u7 
npoe3A 22c2 
Mocca 
CTap0K'1p0LlHS117 
nep. 6 
MocKBa yn. 
BepToneTLMKoa 4 
MocKBa yn. 
J7aapMHeHK0 5 
MocKBa yn. 
BepToneTLMKoa 13 
Latitude 
55.763432 
55.766567 
55.683793 
55.683793 
55.683793 
Longitude 
37.562389 
37.671229 
37.928704 
37.928704 
37.928704 

We can use the Follium Map to see the flats from the final dataset on the Moscow map:

Machine generated alternative text:
Cegepo 
86 
KpacH0roÅcK 
aaHOBCxoe 
000 
0000 
Cege 
& 0 0 0 MOCKB 
napK «nöCUHb'ü 
ocmpog» 
BotToq»ösai 
801004 & 
*000 0 
0 0 00 
floc - 
OAh1Hg BO 
00 0 0 
3ape"be 
48, .49 
P eyroe 
flh06e 
KorenbHv•'x 
Sanaumxa 
Tovønn 
Man 
nec*0i rop0AOK• 
n Hag 

Using the Choropleth Map we can also see the average price per square meter for each district.

Machine generated alternative text:
-126,372 364,142 
443,399 
Average price/m2 for each district in Moscow 
522,655 
601,g 
n06HA 
4 
Aonrpn 
XVIMK 
ny 
qepKM3080 
"cypa 
Womdwxa 
A HAP e 
AeaoacK 
"a-a HTeeaxa 
MblTL,l 
pon 
e 
HaUufHa,1bA8/ür 
PX uf/OcåH"ö 
cmpoa» 
KOBO 
4 
KpacH0 
OAHHgoao 
4 
pc 
6a6aLIJMxa 
eopodcgoü 
nocuno, 
nempoocyuü 
CaepanaBcK/h 
Mot-iM 
Crapasi Kynaaya 
Pauedcxu,l.i 
XYKOBC 
HCKoe 
HorrlHCK 
3neKTpoCTans 
gonnocxaro 
o,1bLLne 
BhSéMbI 
XpaCH03HaveH 
-Cenpr'•1H0 
06ep 
b'Txap"H0 

Having the district coordinates, we can find most popular venues for each district using the Foursquare API:

Machine generated alternative text:
district venues sorted 
O 
2 
3 
4 
121 
122 
123 
Neighborhood 
AGAeM 
Anry$seBcKv.'7 
Ap6eT 
A3ponopT 
SacMeHHEl'7 
FOXHoe Tyu_lhH0 
FOXHonopT03El'7 
1st Most 
Common 
Venue 
Park 
Park 
Coffee Shop 
Café 
Coffee Shop 
Park 
Coffee Shop 
Park 
2nd Most 
Common 
Venue 
Health Food 
Sto re 
Health Food 
Sto re 
Hotel 
Grocery Store 
Hotel 
Gym / Fitness 
Center 
Gym / Fitness 
Center 
Hotel 
3rd Most 
Common 
Venue 
Gym / Fitness 
Center 
Gym / Fitness 
Center 
Park 
Coffee Shop 
Yoga Studio 
Restaurant 
Arcade 
Coffee Shop 
4th Most 
Common 
Venue 
Coffee Shop 
Supermarket 
Yoga Studio 
Restaurant 
Garden 
Coffee Shop 
Martial Arts 
Dojo 
Yoga Studio 
5th Most 
Common 
Venue 
Scenic 
Loo kout 
Auto 
Workshop 
Plaza 
Gourmet Shop 
Bar 
Surf Spot 
Bar 
Theater 
6th Most 
Common 
Venue 
Wine Shop 
Restaurant 
Concert Hell 
Shopping Mall 
Park 
Cosmetics 
Shop 
Convenience 
Sto re 
Pizza Place 
7th Most 
Common 
Venue 
Outdoor Gym 
Clothing Store 
Road 
Bakery 
Art Gallery 
Concert Hell 
Nightclub 
Scenic 
Loo kout 
8th Most 
Common 
Venue 
Trail 
Dance Studio 
Bookstore 
Dessert Shop 
Plaza 
Pet Sto re 
Auto 
Workshop 
Concert Hell 
9th Most 
Common 
Venue 
Soccer Field 
Coffee Shop 
Russian 
Restaurant 
Supermarket 
Gym / Fitness 
Center 
Health 
Health 
Food 
Sto re 
Food 
Sto re 
Bar 
10th Most 
Common 
Venue 
Arcade 
Yoga Studio 
Boutique 
Modern 
European 
Restaurant 
Pizza Place 
Sports Bar 
Music Venue 
Garden 

Finally, with all the collected data we can run k-means clustering to cluster the districts. There were 11 clusters generated, as it appears to be the best k value in this case. Due to the highly diversified locations, 7 clusters have only one district inside. For example, one district with a Zoo was identified as a separate cluster (red dot on the map below) or another one has one of the most popular food markets inside, so it was also allocated to a separate cluster (green dot). The most interesting for analysis are the 4 clusters that have many districts, so let's analyze each of the clusters.

Machine generated alternative text:
noeapoB0 
-3e 
MeHAeneeB0 
J" Henpacoec«v• 
n06HA 
onronp 
X/MK/ 
ny WHO 
"leaHteeEKa 
OponeB 
qep»oron0BKa 
eepan0Bcgs4't 
cypa 
HHr9poA 
3neKTporopCK 
AeA08CK 
o 
00 
n HHo-netpoeCxøC1 
M OHHHO 
o 
pacyoro c 
oo 
poo 
HoeoøeaHp 
o 
OAVI*LAOBO- 
HornHCK 
60nbuwe 
6anau.J/xa— C'åÅag Kynae.-.a 
3neKTpocvanb 
.00 
o 
00 
Jli06e bl 
o 
YAenb ag 
•ne«tpoyrn/ 
Ope 
AaBOAOBC 
Kypo 
yvxog 
000 
B 'Anoe 
AOMOAeA0 
XYKOB K 
y6"€a 
An neona 
Cenqn.1H0 
Mocxga 
Ipoøux 
o 
be noo 
MOCK npeuxeü 
EpoHH"tAbl 

The first cluster is represented by blue dots on the map above. The most popular venues there are parks. By analyzing the data, we can see that these are the most 'green' districts with plenty of places for playing sports and buying healthy groceries. If you are looking for the most quiet and natural place to live in Moscow, I would choose one of the districts from the 'blue' cluster:

Machine generated alternative text:
[29) : 
[29) : 
c lusterl 
clusterl 
Il 
19 
31 
= moscow 
merged . loc ' Cluster 
Labels • ] 
moscow_merged . columns[ [e] 
2nd Most 
Common 
Venue 
Clothing 
Store 
Supermarket 
Health Food 
Store 
Health Food 
Store 
Health Food 
Store 
Health Food 
Store 
Gym / Fitness 
Center 
Gym / Fitness 
Center 
Gym / Fitness 
Center 
Coffee Shop 
Health Food 
Store 
Gym / Fitness 
Center 
+ list (range(5, 
3rd Most 
Common 
Venue 
Gym / Fitness 
Center 
Gym / Fitness 
Center 
Gym / Fitness 
Center 
Gym / Fitness 
Center 
Pet Store 
Gym / Fitness 
Center 
Clothing 
Store 
Supermarket 
Coffee Shop 
Gym / Fitness 
Center 
Gym / Fitness 
Center 
Coffee Shop 
moscow_merged . shape [I] ) ) 
Neig h borhood 
K0MM'jHapKa 
An Tye esc"' '7 
E/üpeso 
Eøponeso 
Bocrogsoe 
SpaTeeso 
Bocrogsoe 
Lerp-I o 
44.747059 
42.500000 
63.238889 
37.625000 
32.000000 
39471429 
50ß41176 
50.950000 
48.183333 
59400000 
46.560000 
41.790000 
P rice/m2 
181391.181176 
157214.285000 
187058.515000 
196562.500000 
191089.107143 
153228.715882 
175673.175000 
195433.213333 
269150411667 
192467.846000 
177876.856000 
Latitude 
55.755814 
55.509034 
55.688005 
55.879849 
55.870056 
55.894768 
55.594585 
55.633434 
55.730771 
55.827247 
55.884277 
55.696357 
Cluster 
Longitude 
Labels 
37.617635 
37.563377 
37.572684 
37.582278 
37.551636 
37.607700 
37.678649 
37.765058 
37.815184 
3747342 
37.558841 
37.824553 
1st Most 
Common 
Venue 
Park 
Park 
Park 
Park 
Park 
Park 
Park 
Park 
Park 
Park 
Park 
Park 
4th Most 
Common 
Venue 
Restaurant 
Fast Food 
Restaurant 
Coffee Shop 
Supermarket 
Au to 
Workshop 
Supermarket 
Health Food 
Store 
Health Food 
Store 
Café 
Health Food 
Store 
Restaurant 
Pet Store 
5th Most 
Common 
Venue 
Café 
Pizza Place 
Scenic 
Lookout 
Workshop 
Gym / Fitness 
Center 
Coffee Shop 
Cosmetics 
Shop 
Beer Store 
Cosmetics 
Shop 
Gourmet 
Shop 
Au to 
Workshop 
Health Food 
Store 
6th Most 
Common 
Venue 
Cosmetics 
Shop 
Gas Station 
Wine Shop 
Restaurant 
Supermarket 
Clothing 
Store 
Pet Store 
Cosmetics 
Shop 
Bakery 
Spa 
Pet Store 
Dance Studio 
7th Most 
Common 
Venue 
Italian 
Rests u rant 
Grocery Store 
Outdoor Gym 
Clothing 
Store 
Stables 
Shopping 
Mall 
Supermarket 
Caucasian 
Restaurant 
Grocery Store 
Lingerie Store 
Cosmetics 
Shop 
Restaurant 
8th Most 
Common 
Venue 
Jewelry Store 
Gym 
Trail 
Dance Studio 
Pizza Place 
Gym 
Caucasian 
Rests u rant 
Pet Store 
Beer Store 
Beach 
Supermarket 
Gourmet 
Shop 
9th Most 
Common 
Venue 
Gourmet 
Shop 
Restaurant 
Soccer Field 
Coffee Shop 
Cosmetics 
Shop 
Big Box Store 
Restaurant 
Middle 
Eastern 
Restaurant 
Soccer 
Stadium 
Big Box Store 
Grocery Store 
10th Most 
Common 
Venue 
Supermarket 
Salon 
Barbershop 
Arcade 
Yoga Studio 
Salon / 
Barbershop 
Jewelry Store 
Shopping Mall 
Irish Pub 
Theater 
Convenience 
Store 
Clothing Store 
Shoe Store 

The second cluster, where dots are colored in brown, looks more urban than the previous cluster. It still has a lot of parks, but there are also a lot of other places like a variety of eating and coffee shops. These districts are also perfect for doing sports, but there you will feel a more 'in town' vibe with plenty of facilities.

Machine generated alternative text:
clusters — 
— moscow 
clusters 
merged . loc ' Cluster 
Labels • ] 
moscow_merged . columns[ [e] 
1st Most 
2nd Most 
Common 
Common 
Venue 
Venue 
Gym / Fitness 
Park 
Center 
Park 
Dance Studio 
Park 
Coffee Shop 
Gym / Fitness 
Park 
Center 
Gym / Fitness 
Park 
Center 
Gym / Fitness 
Park 
Center 
Gym / Fitness 
Park 
Center 
Coffee Shop 
Park 
Gym / Fitness 
Park 
Center 
Health Food 
Park 
Store 
Gym / Fitness 
Coffee Shop 
Center 
Gym / Fitness 
Health Food 
Center 
Store 
Gym / Fitness 
Coffee Shop 
Center 
Gym / Fitness 
Park 
Center 
+ list (range(5, 
moscow_merged . shape [I] ) ) 
63 
Neig hborhood 
Eøponeso 
Bocrogsoe 
3±03" H o 
"say 
Koc"" o- 
Map*" H o 
M erporopogox 
HaraT"H0- 
HaropssM 
43400000 
60.900000 
67.750000 
39.666667 
42.833333 
42.625000 
33.840000 
89.500000 
39.000000 
22.000000 
33.000000 
41.985714 
37.210000 
53400000 
P rice/m2 
174107#2000 
238147.987500 
280398.877500 
219247.693333 
192487.005556 
207554.097500 
204431.260000 
241446.363333 
175641.030000 
272727.270000 
175757.580000 
227426.520000 
260405.198000 
222649.350000 
Latitude 
55.587860 
55.819241 
55.814123 
55.795818 
55.824162 
55.654066 
55.771479 
55.783681 
55.717061 
55.830002 
55.823616 
55.671422 
55.682849 
55.664659 
Cluster 
Longitude 
Labels 
37.639644 
37.703415 
37.589204 
37.821804 
37.796130 
37.589608 
37.824005 
37.772783 
37.863450 
37.588745 
37.755832 
37.641710 
37.681568 
37.615470 
3rd Most 
Common 
Venue 
Clothing 
Store 
Gym / Fitness 
Center 
Health Food 
Store 
Gym 
Supermarket 
Health Food 
Store 
Coffee Shop 
Gym / Fitness 
Center 
Pet Store 
Coffee Shop 
Dance Studio 
Coffee Shop 
Park 
Health Food 
Store 
4th Most 
Common 
Venue 
Pizza Place 
Coffee Shop 
Photography 
Studio 
Supermarket 
Candy Store 
Coffee Shop 
Supermarket 
Supermarket 
Coffee Shop 
Au to 
Workshop 
Park 
Park 
Health Food 
Store 
Coffee Shop 
5th Most 
Common 
Venue 
Coffee Shop 
Health Food 
Store 
Dance Studio 
Cosmetics 
Shop 
Coffee Shop 
Cosmetics 
Shop 
Pizza Place 
Dance Studio 
Pizza Place 
Photography 
Studio 
Pizza Place 
Sporting 
Goods Shop 
Dance Studio 
Arcade 
6th Most 
Common 
Venue 
Supermarket 
Soccer 
Stadium 
Gym / Fitness 
Center 
Pizza Place 
Dance Studio 
Fish Market 
Cosmetics 
Shop 
Health Food 
Store 
Beer Store 
Gym / Fitness 
Center 
Candy Store 
Arcade 
Arcade 
Pharmacy 
7th Most 
Common 
Venue 
Au to 
Workshop 
Pet Store 
Fountain 
Coffee Shop 
Pizza Place 
Sports Bar 
Gym 
Photography 
Studio 
Cosmetics 
Shop 
Fountain 
Supermarket 
Dance Studio 
Beer Store 
Food & Drink 
Shop 
8th Most 
Common 
Venue 
Big Box Store 
Photography 
Studio 
Supermarket 
Candy Store 
Pet Store 
Arcade 
Beer Store 
Candy Store 
Historic Site 
Supermarket 
Au to 
Workshop 
Wine Shop 
Café 
Skate Park 
9th Most 
Common 
Venue 
Pet Store 
Soccer Field 
Theater 
Dance Studio 
Flower Shop 
Gym 
Historic Site 
Pizza Place 
Multiplex 
Science 
Museum 
Health Food 
Store 
Food & Drink 
Shop 
Bath House 
Café 
10th Most 
Common 
Venue 
Dance Studio 
Supermarket 
Arcade 
Flower Shop 
Café 
Supermarket 
Beer Bar 
Pet Store 
Restaurant 
Beer Store 
Convenience 
Store 
Pharmacy 
Nightclub 
Cosmetics 
Shop 

The next cluster with pink dots mostly consists of districts located quite far from the town center - many of them are close to airports and have 'Trail' as the most common venue, which means that there are quite a lot of forest areas inside the districts. These places are good for those who are not keen on being close to the center of Moscow (for example do not have to commute to the center every day), who have jobs in such remote areas as airports or who just want to live in more ‘natural’ places, but still near the town.

Machine generated alternative text:
cluster6 = 
clusters 
mos cow 
merged . loc ' Cluster 
Labels • ] 
moscow_merged . columns[ [e] 
+ list (range(5, 
moscow_merged . shape [I] ) ) 
1st Most 
Common 
Venue 
Café 
Supermarket 
Park 
Airport 
Lounge 
Supermarket 
Supermarket 
Clothing 
Store 
Supermarket 
Airport 
Service 
Café 
Airport 
Service 
Movie 
Theater 
Park 
2nd Most 
Common 
Venue 
Gym / Fitness 
Center 
Health Food 
Store 
Restaurant 
Airport 
Service 
Clothing Store 
Clothing Store 
Park 
Park 
Supermarket 
Grocery Store 
Supermarket 
Big Box Store 
Pizza Place 
3rd Most 
Common 
Venue 
Airport 
Service 
Park 
Supermarket 
Scenic 
Lookout 
Coffee Shop 
Coffee Shop 
Gym / Fitness 
Center 
Café 
Clothing 
Store 
Coffee Shop 
Coffee Shop 
Pizza Place 
Gym / Fitness 
Center 
4th Most 
Common 
Venue 
Supermarket 
Fast Food 
Restaurant 
Rest Area 
Coffee Shop 
4 
9 
Neig h borhood 
MocKoscK"'7 
MocKoscK"'7 
Tpos•nzx 
A: ponopT 
B Hyxoso 
AOH cc '7 
KpOK0E0 
47.333333 
52.000000 
46.550000 
44.500000 
48.442857 
60466667 
47488333 
51.633333 
29.000000 
71.820000 
37.000000 
52.560000 
47.275000 
P rice/m2 
180645.263750 
145546.985000 
156829.279000 
159806.910000 
163715.341429 
192210.563333 
163809.746875 
141985.216667 
131034ß80000 
262446.278000 
172972.970000 
313983.910000 
139882.672500 
Latitude 
55.633500 
55.527326 
5549571 
55.595160 
55.602144 
55.608404 
55.578330 
55484842 
55.570014 
55.803312 
55.610845 
55.697798 
55.969330 
Cluster 
Longitude 
Labels 
37.290298 
37443200 
37.366610 
37.208273 
37.346551 
37.368901 
37.305561 
37.322368 
37.5425" 
37.296685 
37.618390 
37.176122 
Pizza 
Pizza 
PI ace 
PI ace 
Café 
Restaurant 
Coffee Shop 
Restaurant 
Mobile Phone 
Shop 
Shopping 
Mall 
Café 
5th Most 
Common 
Venue 
Museum 
Fried Chicken 
Joint 
Convenience 
Store 
Du ty -free 
Shop 
Hotel 
Hotel 
Supermarket 
Soccer Field 
Shopping 
Gourmet 
Shop 
Pizza Place 
Restaurant 
8 rewery 
6th Most 
Common 
Venue 
Clothing 
Store 
Clothing 
Store 
Resort 
Convenience 
Store 
Gym / Fitness 
Center 
Gym / Fitness 
Center 
Cosmetics 
Shop 
Farmers 
Market 
Mobile Phone 
Shop 
Shopping 
Mall 
Clothing 
Store 
Convenience 
Store 
Restaurant 
7th Most 
Common 
Venue 
Gym Pool 
Japanese 
Restaurant 
Bakery 
Train Station 
Convenience 
Store 
Convenience 
Store 
Restaurant 
Bakery 
Hotel 
Bakery 
Airport 
Lounge 
Electronics 
Store 
Pharmacy 
8th Most 
Common 
Venue 
Mobile Phone 
Shop 
Italian 
Restaurant 
Trail 
Café 
Jewelry Store 
Grocery Store 
Airport 
Lounge 
Dessert Shop 
Café 
Multiplex 
Coffee Shop 
9th Most 
Common 
Venue 
Gourmet 
Shop 
Restaurant 
Italian 
Restaura nt 
Racetrack 
Park 
Park 
Gourmet 
Shop 
Convenience 
Store 
Supermarket 
Park 
Food & Drink 
Shop 
Pool Hall 
10th Most 
Common 
Venue 
Coffee Shop 
Rest Area 
Grocery Store 
Supermarket 
Big Box Store 
Big Box Store 
Italian 
Restaura nt 
Trail 
Housing 
Development 
Modern 
European 
Restaurant 
Skating Rink 
Beach 

The last cluster, labeled with light blue dots on the map, represents the central part of Moscow with a great variety of cafes, restaurants, hotels (yoga studio is also quite a popular venue there) and the most vibrant life. If you want to always feel 'in the center', this is most likely the best (but, obviously, it is the most expensive) place to live.

Machine generated alternative text:
cluster7 = 
cluster7 
mos cow 
merged . loc ' Cluster 
Labels • ] 
mos cow 
merged . columns[ [e] 
+ list (range(5, moscow_merged.shapeCI]))]) 
Cluster 
Labels 
38 
39 
61 
105 
106 
113 
Neig hborhood 
EacuaHHsM 
Ser os07 
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37.607565 
1st Most 
Common 
Venue 
Coffee Shop 
Coffee Shop 
Coffee Shop 
Park 
Hotel 
Coffee Shop 
Coffee Shop 
Coffee Shop 
Coffee Shop 
Yoga Studio 
Coffee Shop 
Park 
Park 
2nd Most 
Common 
Venue 
Hotel 
Hotel 
Hotel 
Coffee Shop 
Yoga Studio 
Yoga Studio 
Park 
Hotel 
Gym / Fitness 
Center 
Yoga Studio 
Scenic 
Lookout 
Hotel 
3rd Most 
Common 
Venue 
Park 
Yoga Studio 
Yoga Studio 
Yoga Studio 
Concert Hall 
Gym / Fitness 
Center 
Beer Bar 
Hotel 
Park 
Hotel 
Hotel 
Wine Shop 
Coffee Shop 
4th Most 
Common 
Venue 
Yoga Studio 
Garden 
Park 
Scenic 
Lookout 
Art Gallery 
Health Food 
Store 
Photography 
Studio 
Park 
Plaza 
Road 
Yoga Studio 
5th Most 
Common 
Venue 
Plaza 
Beer Bar 
Theater 
Arts & Crafts 
Store 
Concert Hall 
Yoga Studio 
Yoga Studio 
Russian 
Rests u rant 
Coffee Shop 
Theater 
6th Most 
Common 
Venue 
Concert Hall 
Park 
Photography 
Studio 
Restaurant 
Pizza Place 
Gourmet 
Shop 
Health Food 
Store 
Dance Studio 
Beer Bar 
Theater 
Concert Hall 
Yoga Studio 
Pizza Place 
7th Most 
Common 
Venue 
Art Gallery 
Dance Studio 
Fountain 
Road 
Bar 
Dance Studio 
Russian 
Restaurant 
Theater 
Arcade 
Theater 
Theater 
Scenic 
Lookout 
8th Most 
Common 
Venue 
Bookstore 
Wine Shop 
Coffee Shop 
Music Venue 
Gym / Fitness 
Center 
Concert Hall 
Art Museum 
Hookah Bar 
Pizza Place 
Hotel 
Concert Hall 
9th Most 
Common 
Venue 
Russian 
Rests u rant 
Gym / Fitness 
Center 
Health Food 
Store 
Hotel 
Martial Arts 
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Yoga Studio 
Basketball 
Court 
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DOJ o 
Park 
Auto 
Workshop 
10th Most 
Common 
Venue 
Boutique 
Pizza Place 
Concert Hall 
Park 
Basketball 
Court 
Hotel 
Salon 
Barbershop 
Gourmet Shop 
Candy Store 
Flower Shop 
Salon 
Barbershop 
Garden 

**RESULTS**

There are four main clusters in Moscow identified during the research, each of them reflects different needs to accompany various lifestyles. The Blue cluster, as discussed above, will be mostly suitable for people who love parks, nature, need a lot of sport facilities, but still want to be closer to the center and don’t have a demand for such venues as cafes, restaurants or just more modern infrastructure near their home. Brown cluster is more ‘equipped’ for the town comparing to the Blue one and also contains a lot of sport facilities, but at the same time you can find a wider range of venues in these districts. The Pink cluster is mostly quite far from the center with more forest areas. You will probably need a car to live there and comfortably reach all the necessary venues in the district. The Light Blue cluster is the town center with its usual pros and cons for such places: high diversity of nearby venues, but high prices and almost no ‘green’ areas.

You can see all clusters described above on the final visualization together with the average prices per square meter in Moscow. We can see that there are a lot of districts which fall under one cluster but have different prices per square meter. Using this map, you can find the districts with the infrastructure type you want and find the similar ones, but in a different price range.

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**DISCUSSION AND CONCLUSION**

Using the flats data parsed from CIAN website, geodata and Foursquare venues data, we looked at the flat price ranges across different districts in Moscow, their top venues and clustered the data according to the most popular venues. This allowed us to reveal the most suitable areas to live for different lifestyles and needs. Of course, as mentioned earlier, this study does not provide an absolutely full picture to make a decision on buying a flat in the certain location: you must also consider such factors as condition of the house, ecological situation, transportation system, maybe even crime level of a certain district and a lot more. This study, however, helps to get the first overall impression of each district and what you can expect in terms of price and facilities if you decide to buy your flat there.

**REFERENCES**

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6. [https://developer.foursquare.com/docs/](https://developer.foursquare.com/docs/-) – venues data
7. <https://github.com/aipastukhova/Coursera_Capstone/blob/master/Moscow%20flats%20Coursera_IBM.ipynb> – ipynb