How to Open Most Attractive Student Cafe ?

Andrey Skurikhin

Data Science Capstone

IBM Data Science Professional Certificate on Coursera

Introduction

BACKGROUND

- Students have to learn good
- Students have to relax after learning

DECISION

- Students can eat in café to learn good
- Students can relax in café to learn good

Proposal

- Let’s open student café to help them!

Risks

- Many Cafes have already opened in district
- Not many students in district
- Small number of colleges in district
- Long distance from café to college

Decision

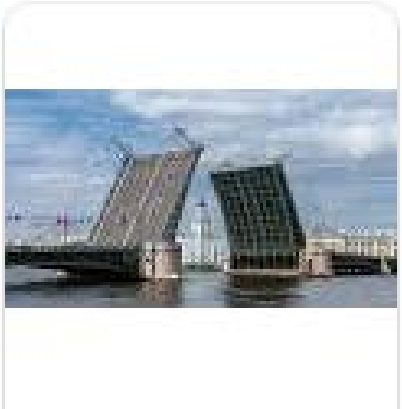
Apply Data science methods to avoid Risks:

- Select the best city
- Filter the high risk places
- Cluster Remaining places
- Select the best cluster and have profit!

Top 6 Russian Cities

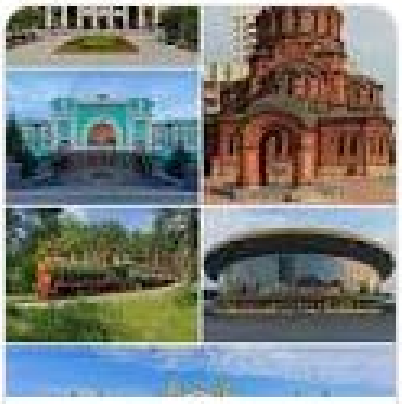
Moscow

Saint Petersburg



Yekaterinburg

Novosibirsk



Kazan

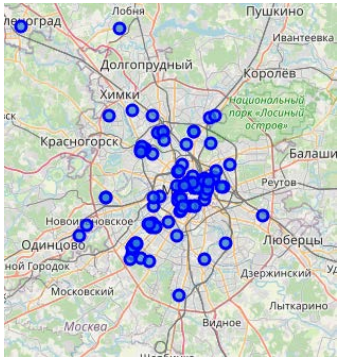
Nizhniy Novgorod

Foursquare API

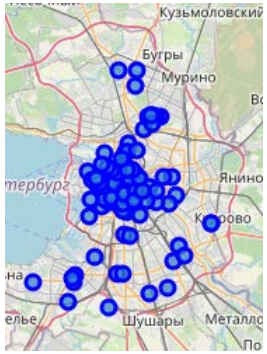
- cities = ["Moscow, RU", 'Saint Petersburg, RU', 'Novosibirsk, RU', 'Yekaterinburg, RU', 'Kazan, RU', 'Nizhny Novgorod, RU']
- url_cafe = 'https://api.foursquare.com/v2/venues/explore?&client_id={}&client_secret={}&v={}&near={}&limit={}&categoryId={}'.format("4bf58dd8d48988d16d941735") # Cafe CATEGORY ID
- url_college = 'https://api.foursquare.com/v2/venues/explore?&client_id={}&client_secret={}&v={}&near={}&limit={}&categoryId={}'.format("4d4b7105d754a06372d81259") # College CATEGORY ID

Checking College Location

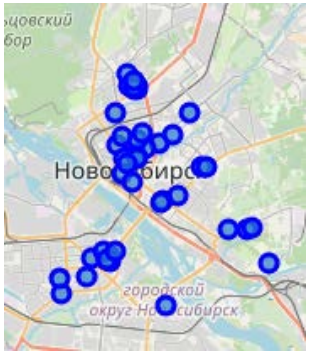
Moscow



Saint-Petersburg



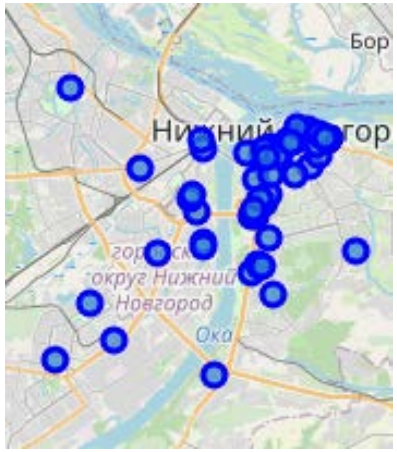
Novosibirsk



Yekaterinburg

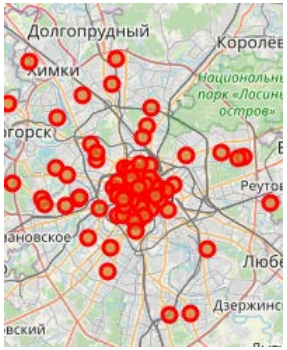
Kazan

Nizhniy Novgorod



Checking Cafe Location

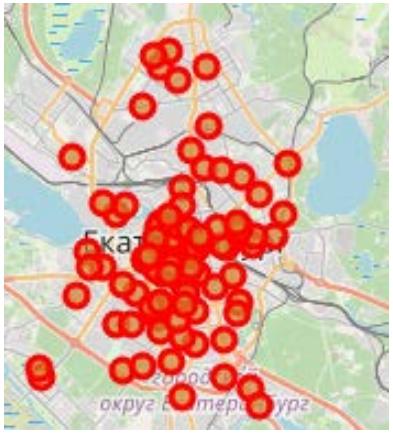
Moscow



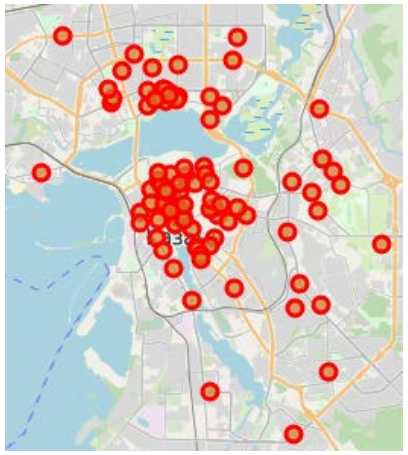
Saint-Petersburg

Novosibirsk

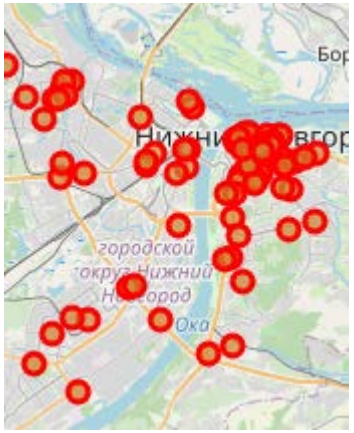
Yekaterinburg



Kazan



Nizhniy Novgorod



Checking Number of Colleges and Café to College Density

Total number of college places in Moscow, RU = 224

Cafes per college in Moscow, RU = 1.375

Total number of college places in Saint Petersburg, RU = 220

Cafes per college in Saint Petersburg, RU = 1.327

Total number of college places in Novosibirsk, RU = 46

Cafes per college in Novosibirsk, RU = 2.435

Total number of college places in Yekaterinburg, RU = 76

Cafes per college in Yekaterinburg, RU = 1.618

Total number of college places in Kazan, RU = 100

Cafes per college in Kazan, RU = 1.35

Total number of college places in Nizhny Novgorod, RU = 63

Cafes per college in Nizhny Novgorod, RU = 1.905

Anti-leaders for density are

Moscow, St.Petersburg and Kazan

Code for searching café nearby colleges

Check for euclidian distance. Latitudes are similar, so we can neglect it for simplicity

```
 for latcl, lngcl, labelcl  in zip(college[city]['Lat'], college[city]['Lng'], college[city]['Name']):
        numcafe = 0
        for latcf, lngcf, labelcf  in zip(cafe[city]['Lat'], cafe[city]['Lng'], cafe[city]['Name']):
            dist=sqrt((latcl-latcf)*(latcl-latcf)+(lngcl-lngcf)*(lngcl-lngcf))
            if (dist < 0.01):
                numcafe = numcafe + 1
```

Checking Cafes in 10 minutes walk from College

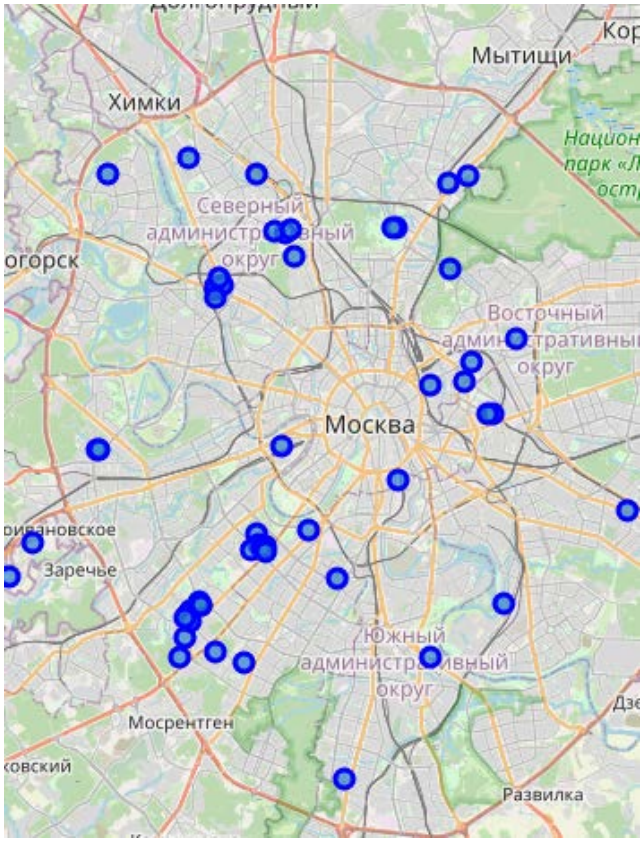
Total number of college places no cafe in Moscow = 56
Percent of college places no cafe in Moscow = 25.0%
Total number of college places no cafe in St Petersburg = 38
Percent of college places no cafe in St.Petersburg = 17.2%
Total number of college places no cafe in Novosibirsk = 11
Percent of college places no cafe in Novosibirsk = 23.9%
Total number of college places no cafe in Yekaterinburg = 9
Percent of college places no cafe in Yekaterinburg = 11.8%
Total number of college places no cafe in Kazan, RU = 17
Percent of college places no cafe in Kazan, RU = 17%
Total number of college places no cafe in Nizhny Novgorod = 6
Percent of college places no cafe in Nizhny Novgorod = 9.5%
Anti-Leaders are Moscow and Novosibirsk

City Select

Based on Anti-Leader top in both cases, we need to select **Moscow** as a candidate for café placement

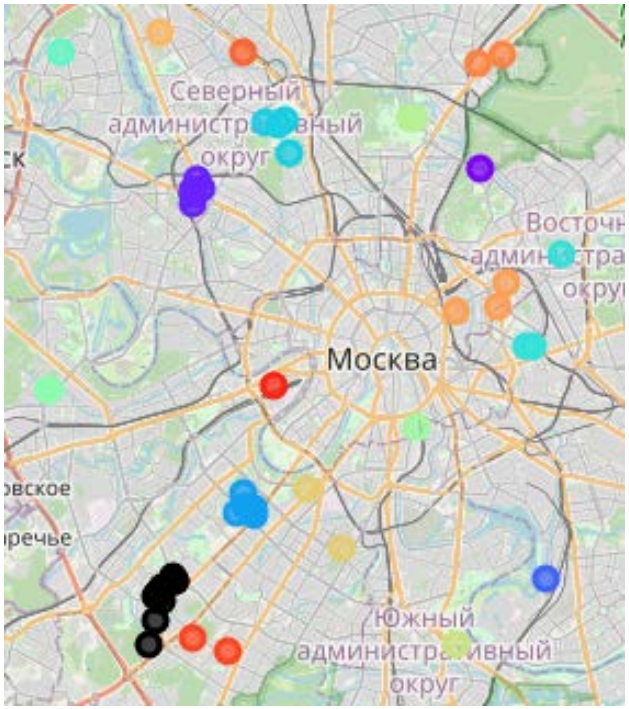
Filtering data

Let's remove from map such colleges that have at least 1 café nearby (10-mintes walk)

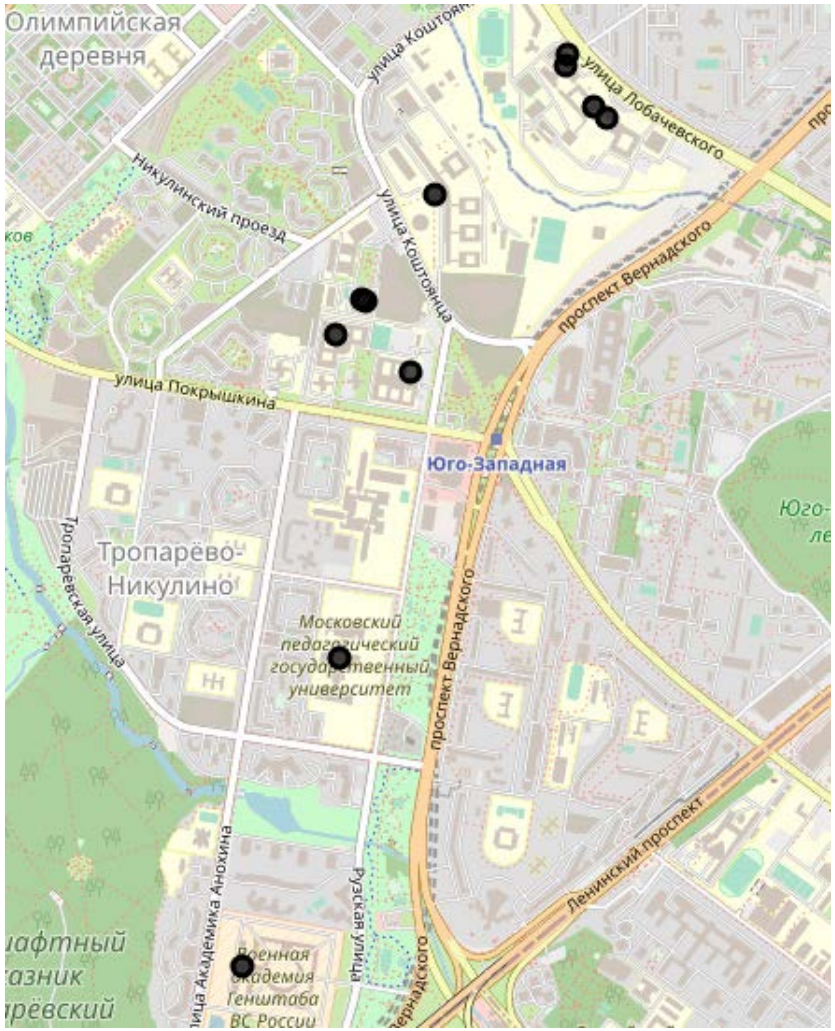


Clustering Data

- Let's cluster remained colleges in groups based on distance using k-means method. Maximum cluster is marked by black



We will place our first student café in this neighborhood



That's All

Thank you!