# THE BATTLE OF NEIGHBORHOODS
## Denver vs Toronto

IBM Applied Data Science Capstone Project

https://github.com/cansumericli/Coursera_Capstone

# IBM Applied Data Science Capstone Project Business Problem

- This project aimed to find the best neighborhood for opening a new mall in Denver, Colorado by comparing the Toronto data set. Here are some questions that will be answered to decide the best neighborhood for the new mall.

- 1. Should the new mall be close to restaurants or more residential areas?
- 2. Should the new mall be in more multicultural neighborhoods?
- 3. Should the new mall be accessible with variety of public transportations?

- In this project, I compare two cities, Toronto and Denver, in order to find the best options to build a new Shopping Mall. I use Toronto as an example to project city plan on Denver neighborhoods. According to my work, there is no correlation between shopping malls and other venues.

| | Neighborhoods | ATM | Accessories Store | Adult Boutique | African Restaurant | Airport | Airport Lounge | Airport Service | Airport Terminal | Alternative Healer | ... | Vietnamese Restaurant | Warehouse Store | Weight Loss Center | Whisk B. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Athmar Park | 0.011494 | 0.0 | 0.011494 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ... | 0.114943 | 0.011494 | 0.0 | 0.0114£ |
| 1 | Auraria | 0.000000 | 0.0 | 0.000000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ... | 0.000000 | 0.000000 | 0.0 | 0.00000 |
| 2 | Baker | 0.000000 | 0.0 | 0.000000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ... | 0.010000 | 0.000000 | 0.0 | 0.01000 |
| 3 | Barnum | 0.000000 | 0.0 | 0.000000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ... | 0.078947 | 0.013158 | 0.0 | 0.00000 |
| 4 | Barnum West | 0.000000 | 0.0 | 0.000000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ... | 0.032787 | 0.000000 | 0.0 | 0.00000 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 73 | West Colfax | 0.000000 | 0.0 | 0.000000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ... | 0.000000 | 0.000000 | 0.0 | 0.00000 |
| 74 | West Highland | 0.000000 | 0.0 | 0.000000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ... | 0.000000 | 0.000000 | 0.0 | 0.00000 |
| 75 | Westwood | 0.014085 | 0.0 | 0.000000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ... | 0.112676 | 0.000000 | 0.0 | 0.00000 |
| 76 | Whittier | 0.000000 | 0.0 | 0.000000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ... | 0.000000 | 0.000000 | 0.0 | 0.00000 |
| 77 | Windsor | 0.000000 | 0.0 | 0.000000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ... | 0.010204 | 0.000000 | 0.0 | 0.00000 |

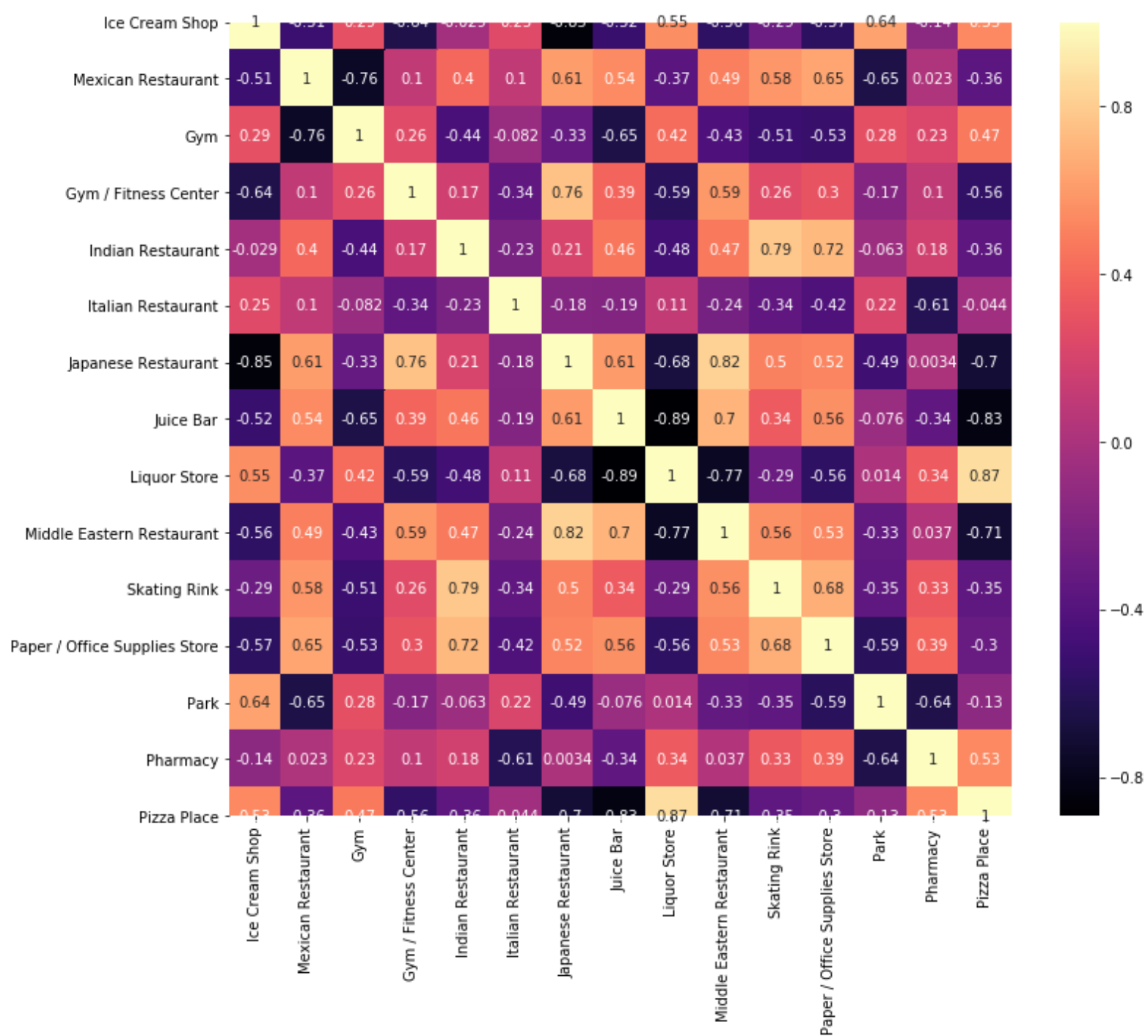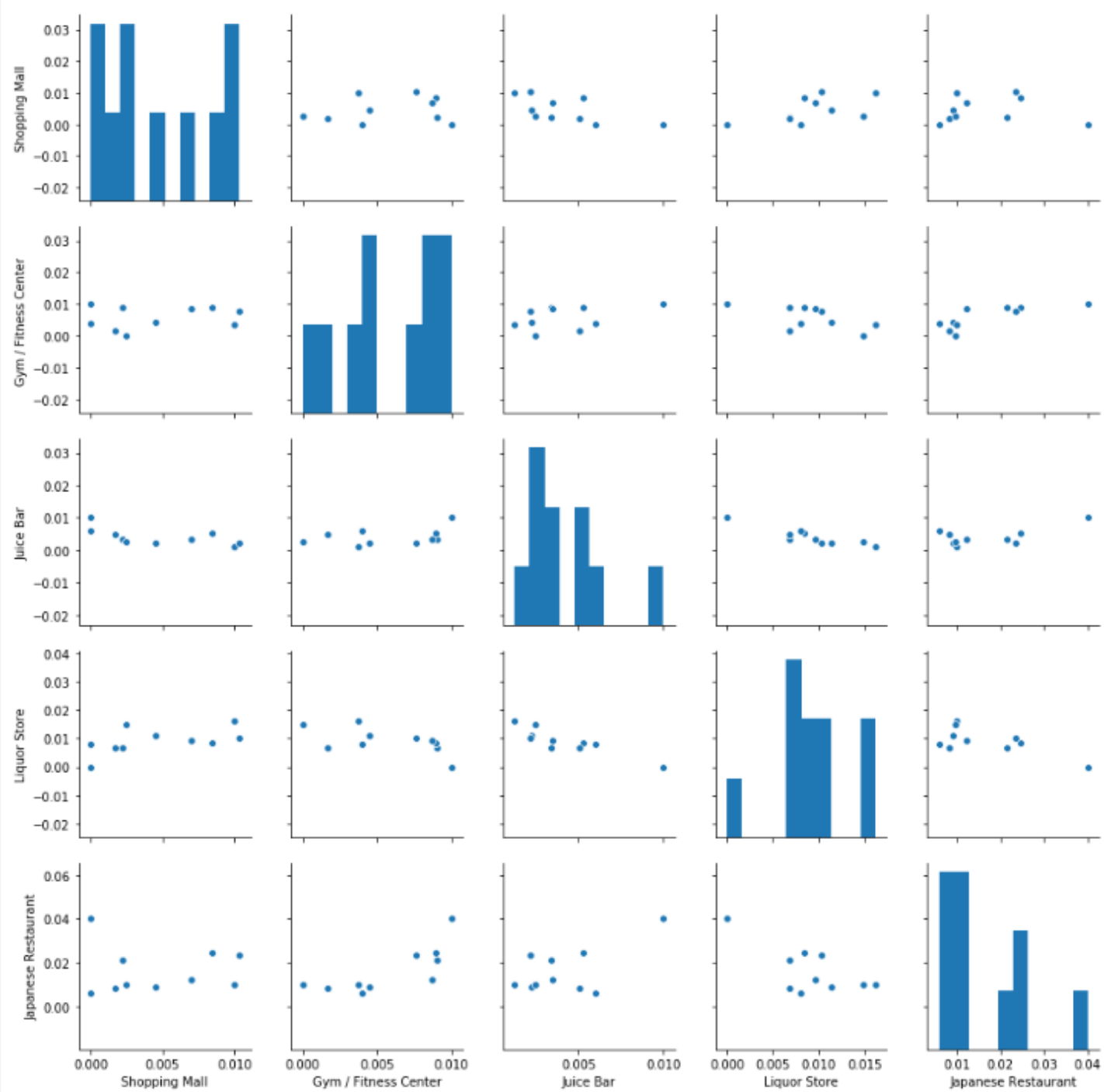`<matplotlib.axes._subplots.AxesSubplot at 0x22e42711208>`
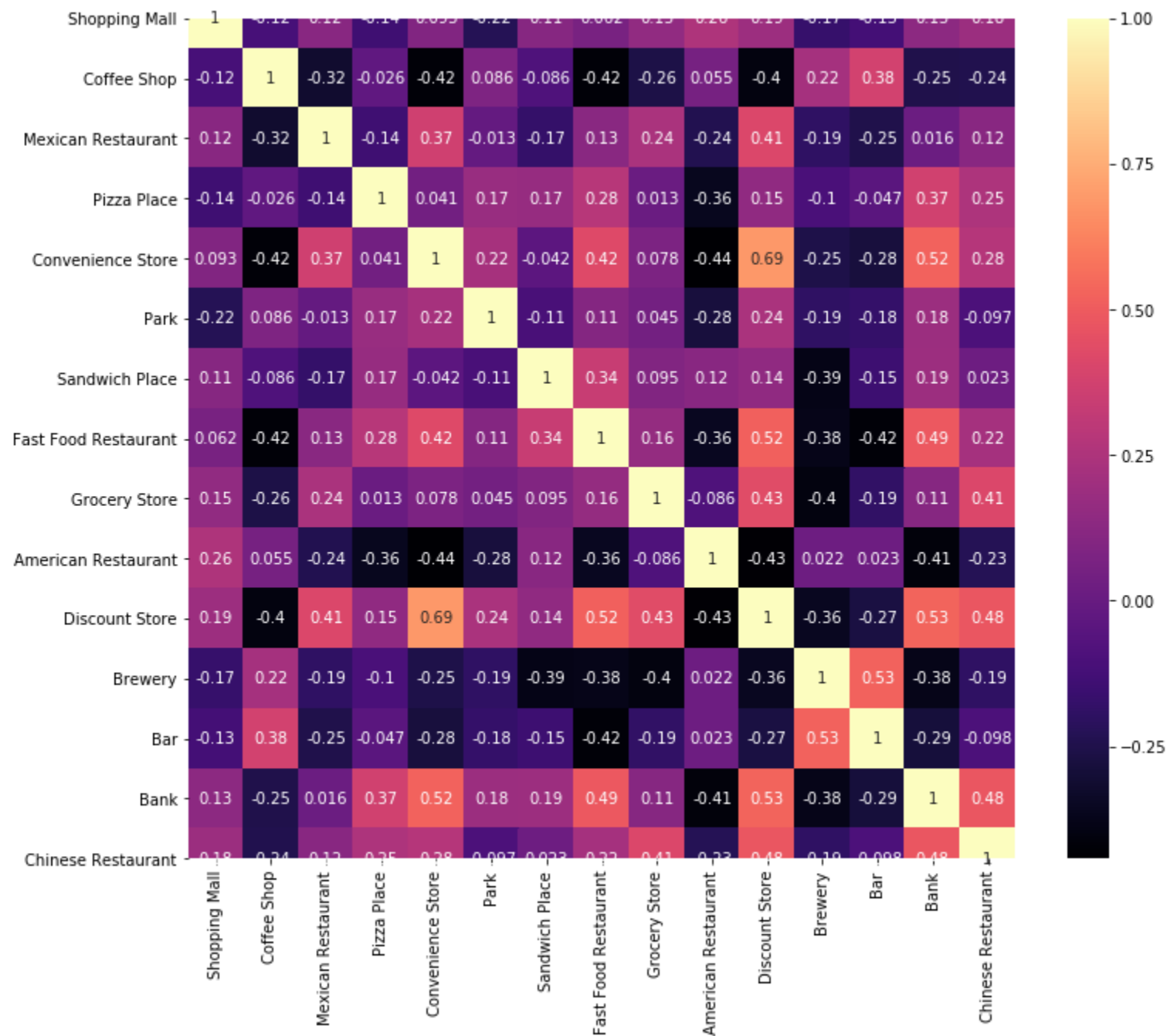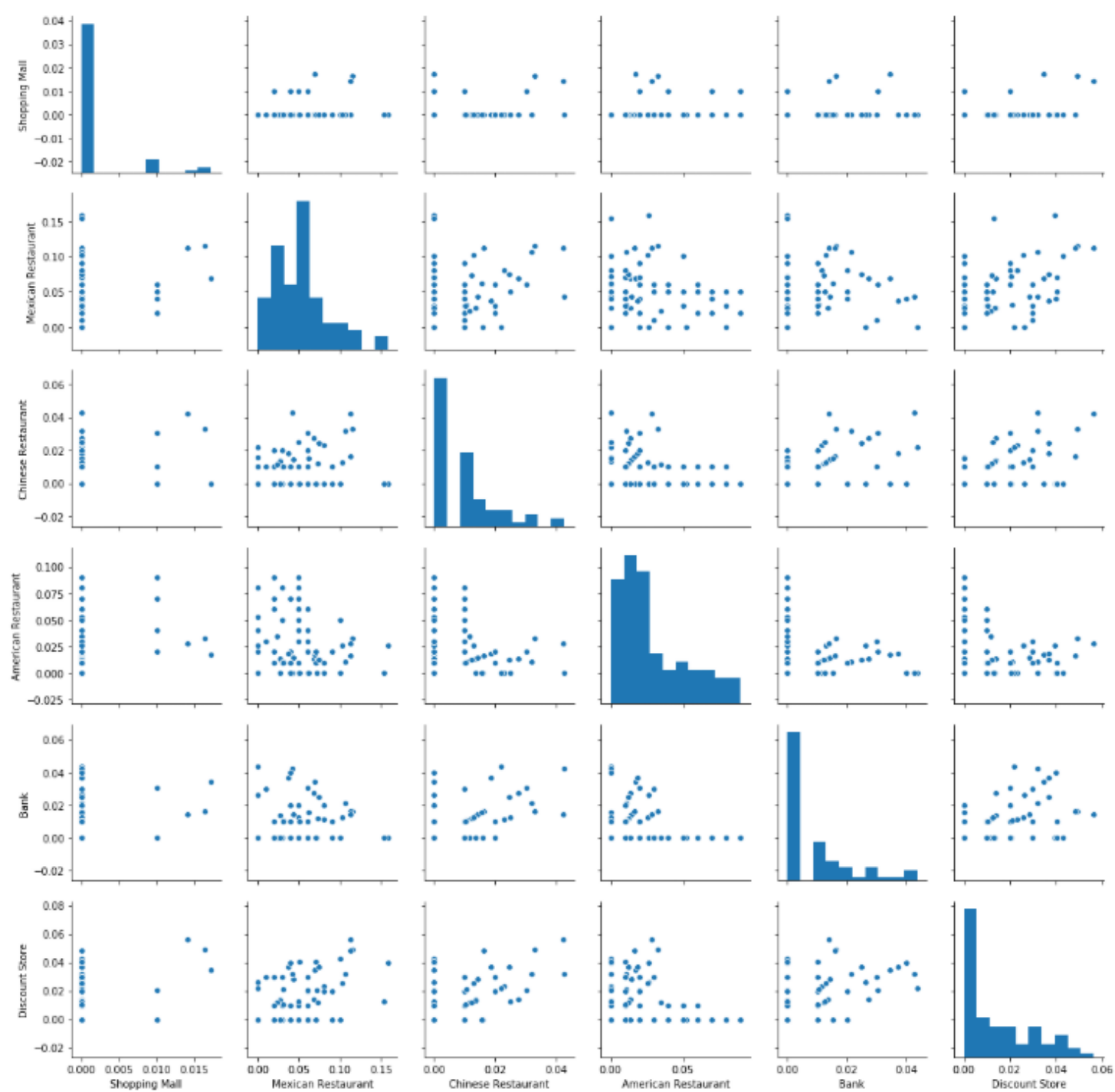
# Toronto

- Therefore, I decided to find where are the shopping malls are in Toronto. I decided to use Boroughs in Toronto instead of Neighborhoods. Because Toronto is much bigger than Denver, and I thought that Boroughs are already clusters of Neighborhoods. And it will make it easier to categorize. This point is totally depending on your decision.

- Since I didn't get any significant correlations between Toronto variables, I decided to chose the most common ones. I will just use the highest negative or positive correlations. Which are Shopping Mall, Gym / Fitness Center, Juice Bar, Liquor Store, Japanese Restaurant.
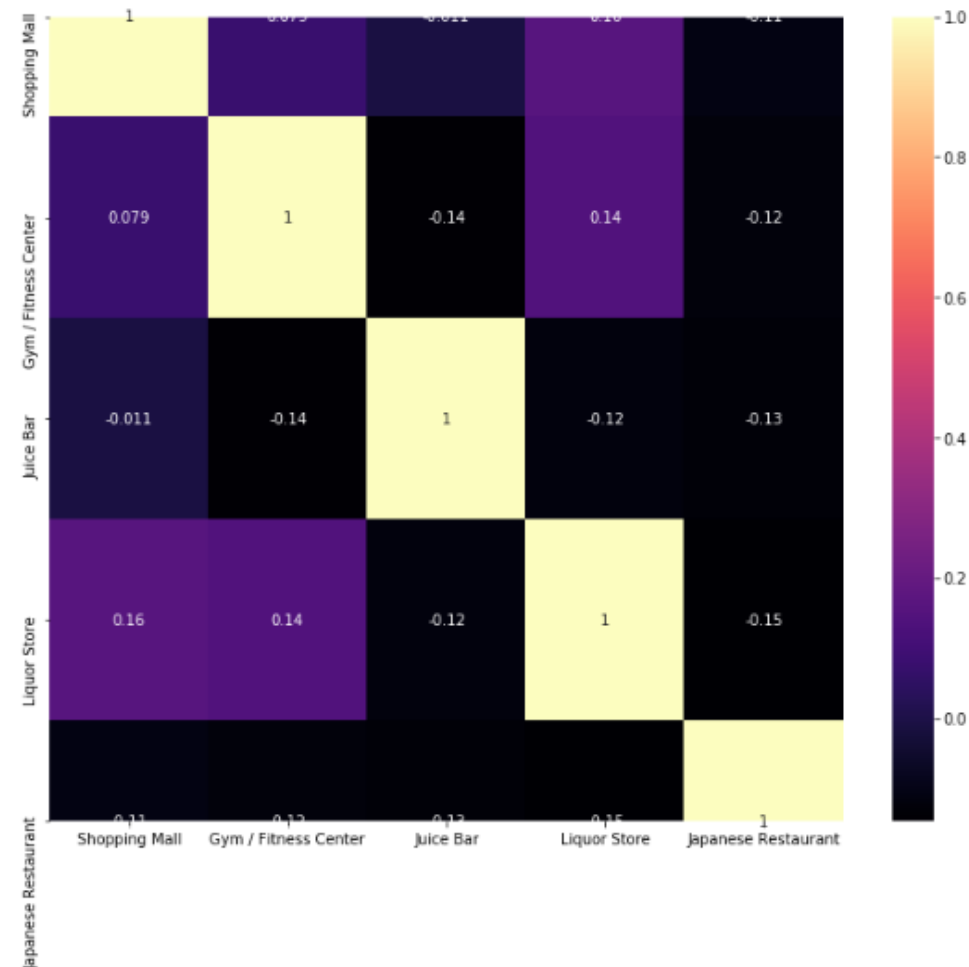
# DENVER

- According to this outcome, I decided to build a new Shopping Mall near the Gym/Fitness Centers. Because, I found the highest correlation with Liquor Store. But also I though that liquor store might be in the Shopping Mall as well. Then the second most correlated variable was Gym/Fitness Center.

- Building a Gym/Fitness Center near the Shopping Mall made much more sense for me. Because, Gym/Fitness Centers mostly adopted Subscription Revenue model. Which means that the clients are paying monthly and they make at least a year of contract with the Gym/Fitness Centers.

- One person with Gym/Fitness Center subsrition will come to Gym/Fitness Center at least twice a week. According to my marketing perspective, I would build a new Shopping Mall near the Gym/Fitness Centers where people regularly visit.
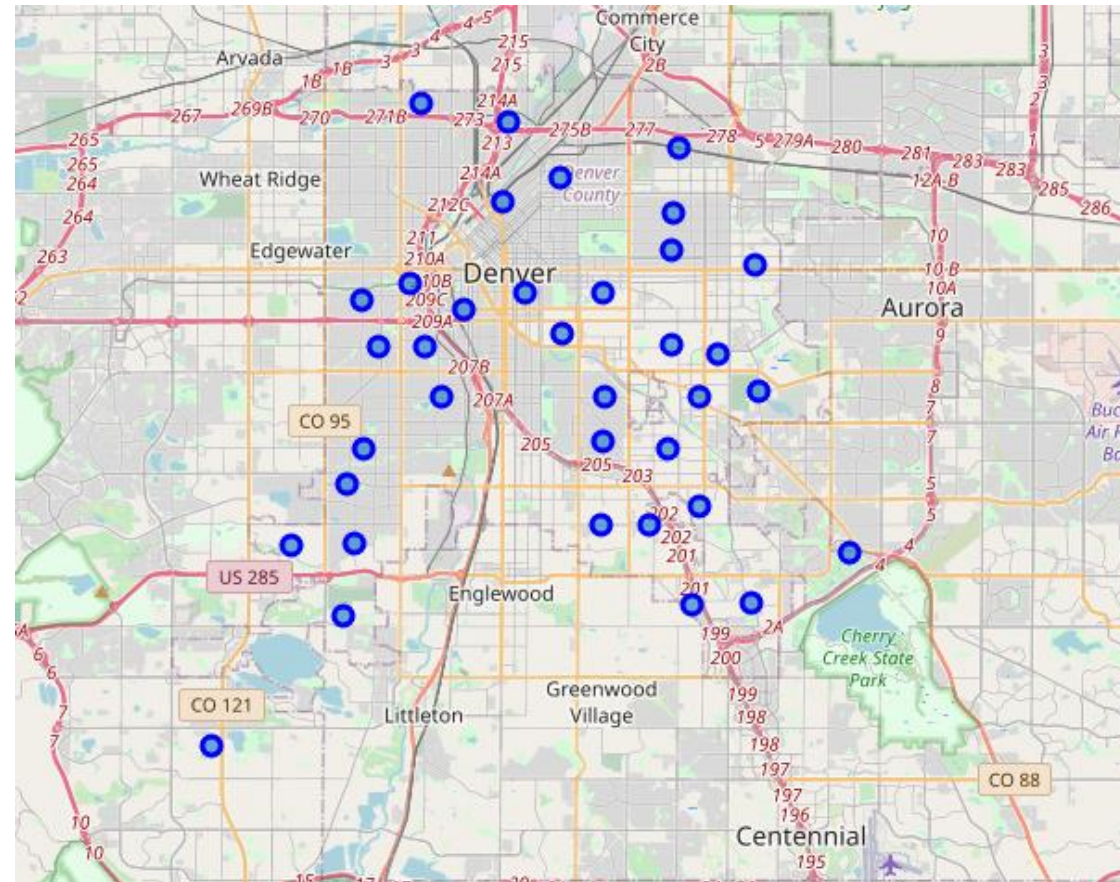
- Here, since my Cluster 2, which contains higher numbers of Shopping Malls, located in West side of the city, I want to build a new Shopping Mall at the East side. In order to do that I found the mean of longitudes and I will choose right side of the mean point.

- For the further desicion, I will use some BI tools to visiulize the data and make a decision. I will use Tableau Data Analysis tool for comparing populations of these neighborhoods. I will collect population information of these neighborhoods from https://www.city-data.com/ .

# Tableau

- According to data, Windsor is the most populated neighborhood between. Therefore, according to all those considerations, as a final decision, I would prefer to build a new Shopping Mall in Windsor, Denver.

# Population by Neighborhoods of Denver, Colorado

| Neighborhood | |
|---|---|
| Windsor | 25,330 |
| Washington Virginia Vale | 17,154 |
| Hampden South | 14,550 |
| Northeast Park Hill | 13,621 |
| Virginia Village | 12,454 |
| Congress Park | 11,684 |
| East Colfax | 10,438 |
| North Park Hill | 10,351 |
| South Park Hill | 10,174 |
| Lowry | 9,349 |
| Goldsmith | 7,399 |
| Southmoor Park | 6,595 |
| University Hills | 6,086 |
| Cory-Merrill | 6,017 |
| Kennedy | 5,044 |
| Cole | 4,463 |
| Belcaro | 4,313 |
| Wellshire | 3,766 |
| Country Club | 3,721 |
| Hilltop | 2,250 |



Map labels: Northeast Park Hill, East Colfax, Country Club, Windsor, Virginia Village, University Hills, Kennedy, Southmoor Park

Population
2,250 — 25,330

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