Fairer Calculation Method of Delivery Fee

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1 Introduction

With the rise of food delivery companies like Seamless and Uber Eats, there are more delivery people on the streets, especially in crowded downtown areas. Deliverymen earn money by charging delivery fees set by delivery companies and merchants. But in most cities, restaurants or drink shops are not evenly distributed. Some neighborhoods have a high concentration of restaurants and coffee shops, which means that delivery people in the neighborhood get more delivery orders, while others may get only a few delivery orders. So if coming to a neighborhood which has only a few restaurants signed up on the delivery websites because of the last order he got, the deliveryman may waste more time on waiting for next order or coming back to downtown. It is unfair for deliverymen that earning less money because of meeting this kind of situation.

In order to solve this problem, in Manhattan, for example, I divided the neighborhoods into two categories based on the number of restaurants and coffee shops in the neighborhood: dense-order district and non-dense-order district. If a deliveryman leave dense-order district for non-dense-order district due to his last order, he can charge a number of extra delivery fees.

2 Data Preparation

(1) Download data about the neighborhoods in New York City, extract useful data and transform it into pandas dataframe.
(2) Explore data of neighborhoods in Manhattan and use Foursquare lab to find out the venues in each neighborhood.
(3) Extract restaurants and drink shops by using the category column.
(4) Separate the neighborhoods according to the number of restaurants and drink shops
(5) Use the data about different kinds of neighborhoods to find a better way to calculate the delivery fees.

3 Exploratory Data Analysis

3.1 Make the map neighborhoods
Using folium package to make a map that contains whole neighborhoods in Manhattan with their coordinate (latitude and longitude)(Figure 1).

3.2 Get venues near neighborhoods
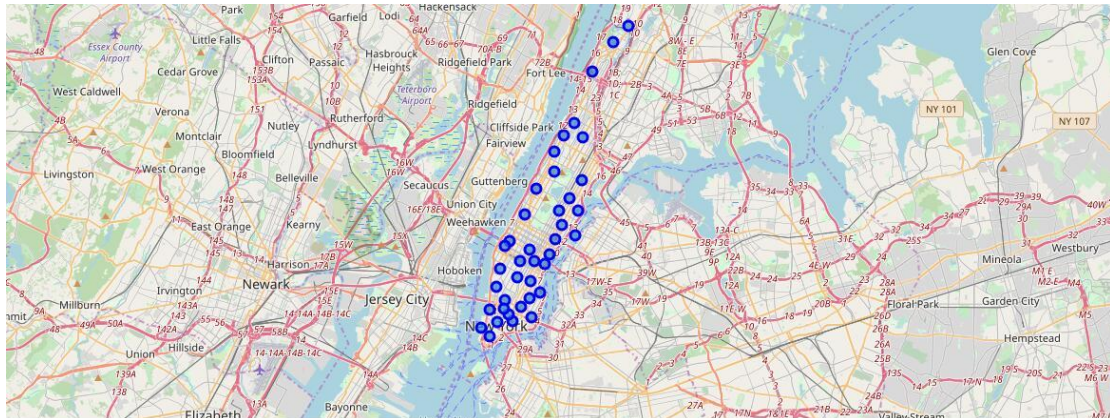Foursquare lab allows people to obtain the nearby venues information by using its API to search with given radius.

Figure 1 Map of Neighborhoods in Manhattan

4 Modeling

Based on the1st, 2nd, 3th most common venues in the neighborhoods, the whole 40 neighborhoods are clustered into 5 clusters. Neighborhoods belong to different cluster are labeled with 5 different colors (Figure 2).
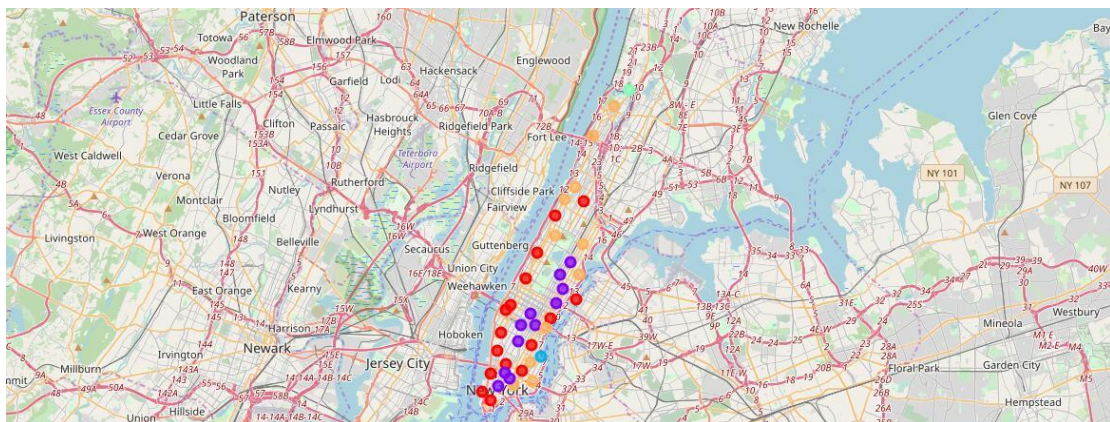

Figure 2 Map of Clustered Neighborhoods

5 Conclusion

Delivery companies, like Seamless and Uber Eats, are able to refer to this way to make the calculation method of delivery fee, so that the deliverymen who make losses due to coming to a neighborhood with a few restaurants where the delivery address of his last order is.