

# RECOMMENDER SYSTEM FOR OPENING A NEW RESTAURANT IN JAKARTA, INDONESIA



IBM Final Capstone Project  
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Dhika Rangga

# Recommender System is valuable to give an insight

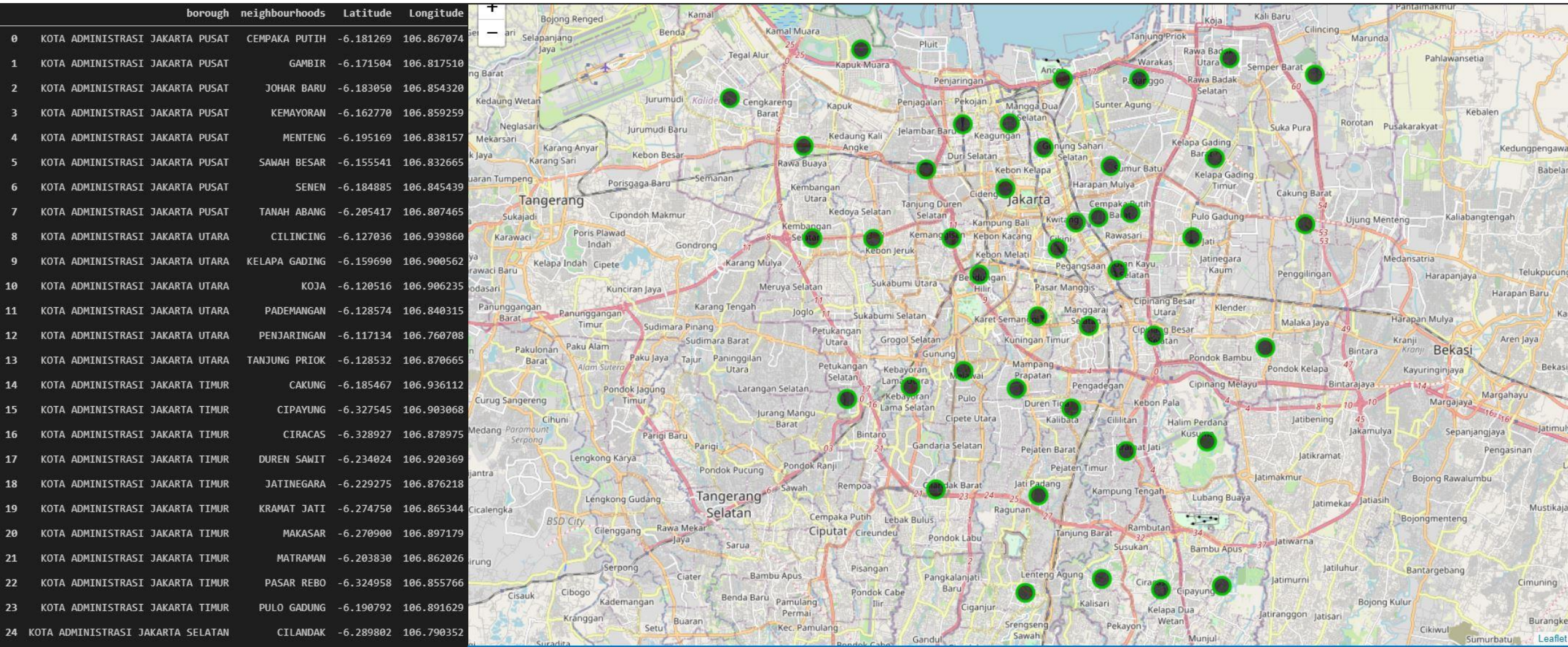
- Jakarta, officially the Special Capital Region of Jakarta (Indonesian: Daerah Khusus Ibukota Jakarta), is the capital and largest city of Indonesia.
- Food service industry growth has been consistent over the past several years. SWA Magazine stated there were 380 million restaurant visits in Jakarta during 2013 and resultant revenues of IDR 22.23 trillion (approx. USD \$1.5 billion).
- The objective of this project is to analyse and select the best category of food & beverage for anyone who wants to open a new culinary business in the city of Jakarta, Indonesia based on every district in its area but they don't have much knowledge about the area so it's hard to decide what kind of food & beverage category they want to open.

# Data acquisition

- List of boroughs and neighborhoods in Jakarta, data scraped from [https://id.wikipedia.org/wiki/Daftar kecamatan dan kelurahan di Daerah Khusus Ibukota Jakarta](https://id.wikipedia.org/wiki/Daftar_kecamatan_dan_kelurahan_di_Daerah_Khusus_Ibukota_Jakarta)
- Geographical coordinates for every neighborhood in Jakarta are provided by <https://github.com/ArrayAccess/Indonesia-Postal-And-Area/>
- Population numbers can be obtained in <https://data.jakarta.go.id/sr/dataset/jumlahpendudukmenurutkecamatanandjeniskelamindkijakarta/resource/ec830fce-7b59-4c65-b74e-b226630f06b2>
- The list of all food & beverage services around Jakarta area from Foursquare API

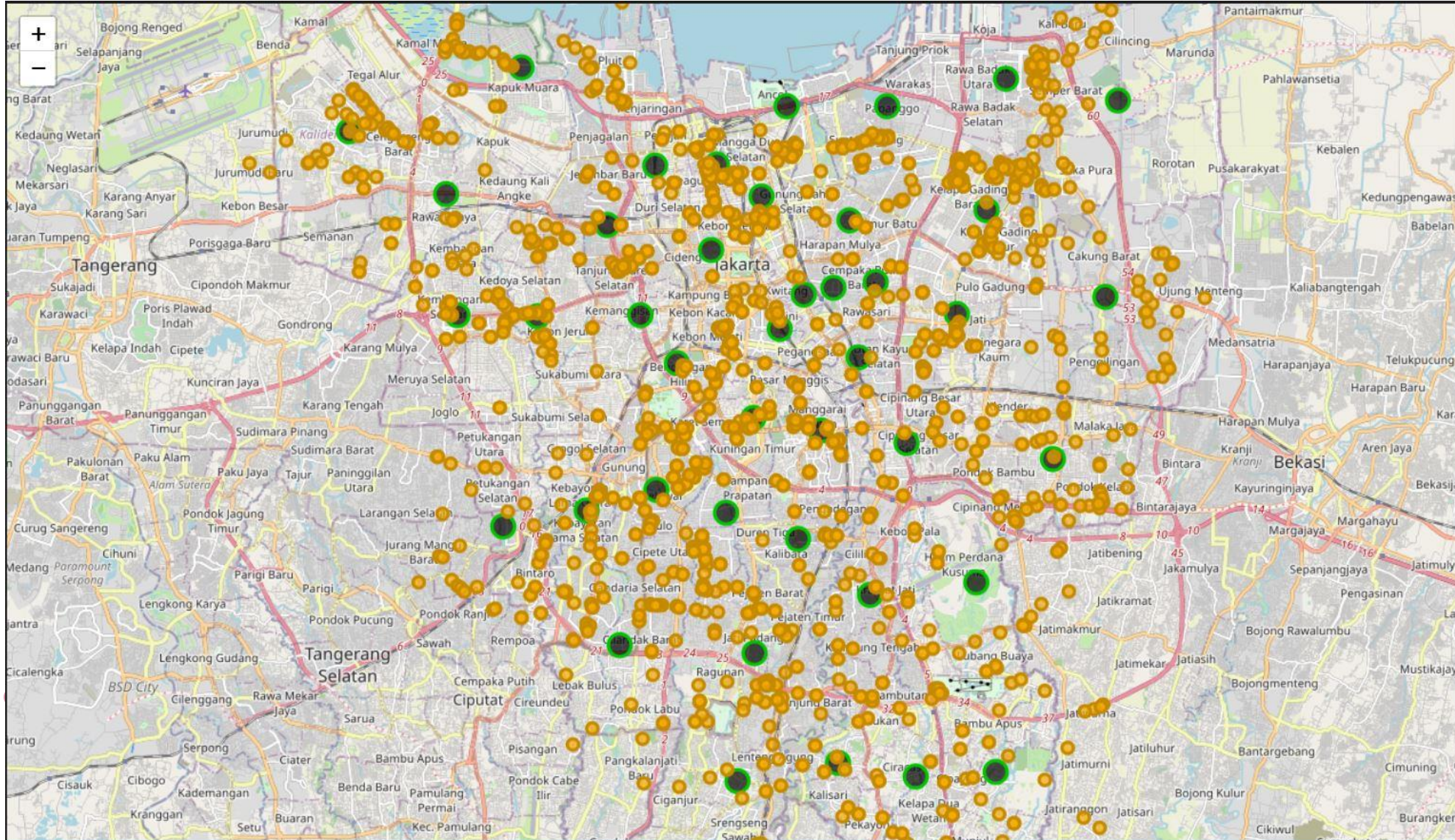


# Jakarta in Visualization



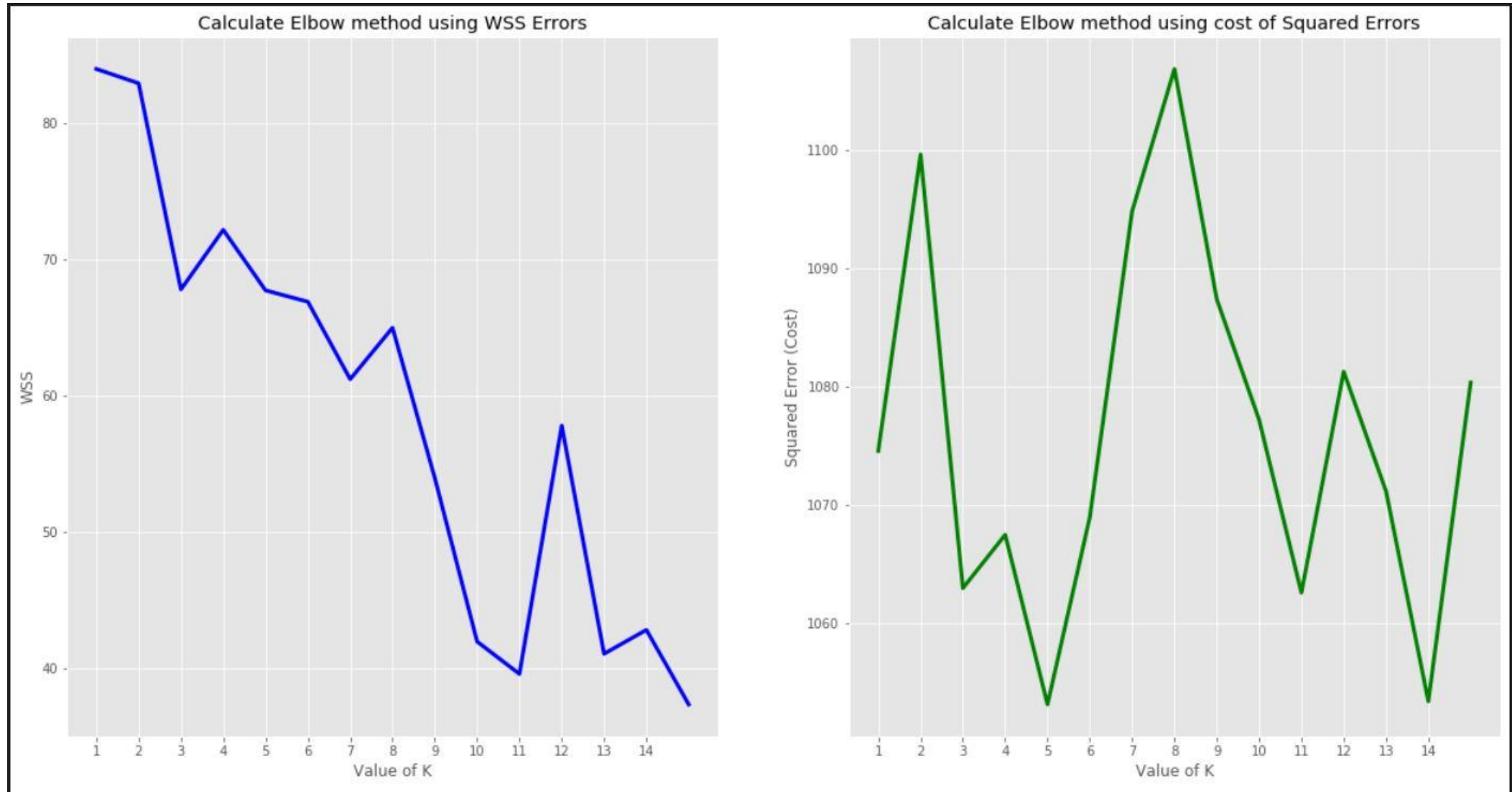


# All Restaurants in Jakarta Area

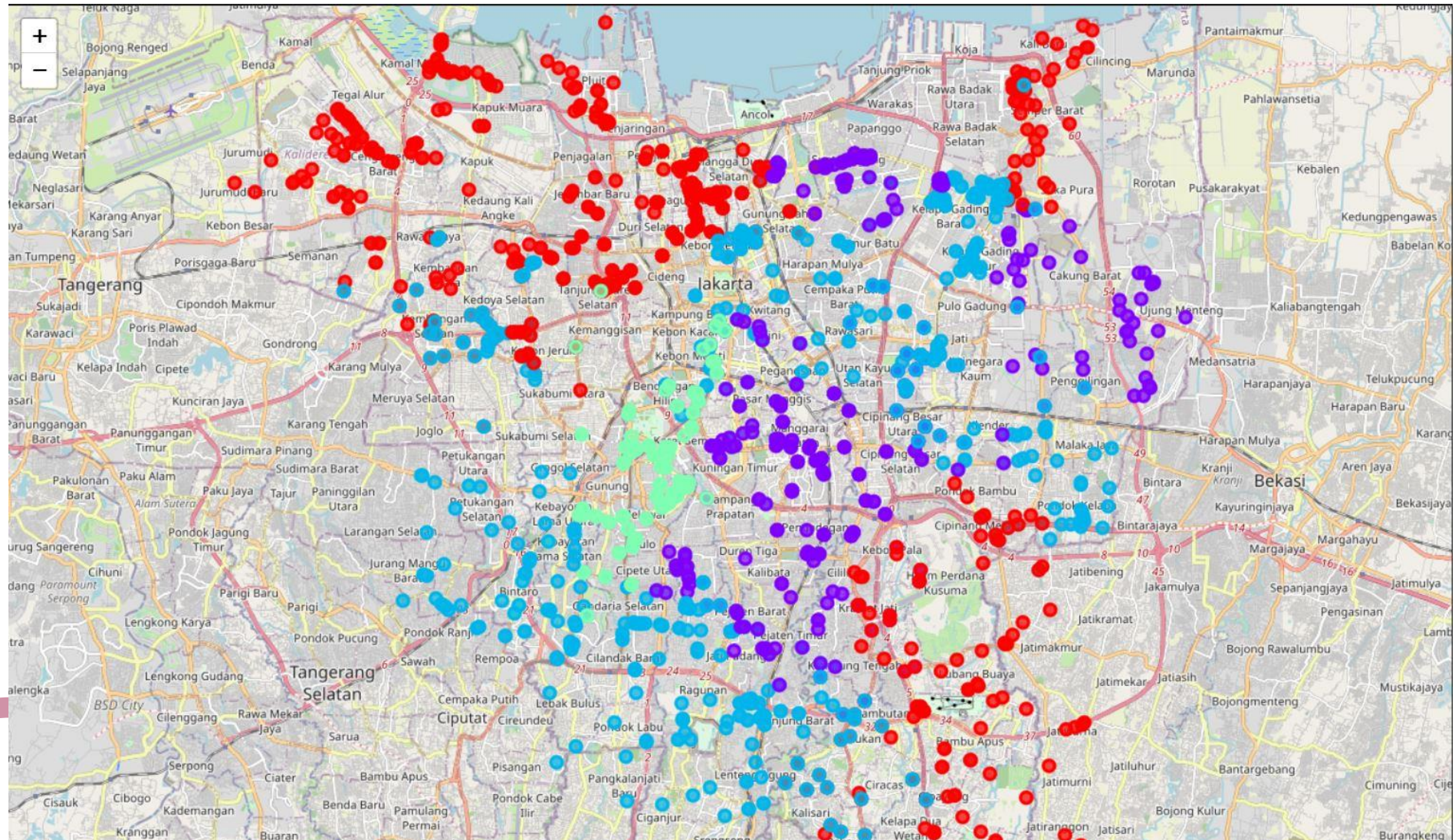




# Find the optimal K value for K-Means



# Visualization of the resulting clusters





# Calculate rank for each category using Weighted Rating (WR) formula

$$WR = \frac{v}{v+m} * R + \frac{m}{v+m} * C$$

	borough	neighborhood	Acehnese Restaurant_WR	American Restaurant_WR	Arepa Restaurant_WR	Argentinian Restaurant_WR	Asian Restaurant_WR	Australian Restaurant_WR	BBQ Joint_WR	Balinese Restaurant_WR	...	Spanish Restaurant_WR	Steakhouse_WR
0	KOTA ADMINISTRASI JAKARTA BARAT	CENGKARENG	0.002837	0.032381	0.000810	0.001216	0.021053	0.000810	0.001621	0.001418	...	0.000405	0.041904
1	KOTA ADMINISTRASI JAKARTA BARAT	CENGKARENG	0.002837	0.032381	0.000810	0.001216	0.021053	0.000810	0.001621	0.001418	...	0.000405	0.041904
2	KOTA ADMINISTRASI JAKARTA BARAT	CENGKARENG	0.002837	0.032381	0.000810	0.001216	0.021053	0.000810	0.001621	0.001418	...	0.000405	0.041904
3	KOTA ADMINISTRASI JAKARTA BARAT	CENGKARENG	0.002837	0.032381	0.000810	0.001216	0.021053	0.000810	0.001621	0.001418	...	0.000405	0.041904
4	KOTA ADMINISTRASI JAKARTA BARAT	CENGKARENG	0.002837	0.032381	0.000810	0.001216	0.021053	0.000810	0.001621	0.001418	...	0.000405	0.041904
...	...	...	...	...	...	...	...	...	...	...	...	...	...
2044	KOTA ADMINISTRASI JAKARTA UTARA	TANJUNG PRIOK	0.003453	0.010359	0.000987	0.011574	0.021193	0.000987	0.001973	0.001727	...	0.000493	0.042140
2045	KOTA ADMINISTRASI JAKARTA UTARA	TANJUNG PRIOK	0.003453	0.010359	0.000987	0.011574	0.021193	0.000987	0.001973	0.001727	...	0.000493	0.042140
2046	KOTA ADMINISTRASI JAKARTA UTARA	TANJUNG PRIOK	0.003453	0.010359	0.000987	0.011574	0.021193	0.000987	0.001973	0.001727	...	0.000493	0.042140
2047	KOTA ADMINISTRASI JAKARTA UTARA	TANJUNG PRIOK	0.003453	0.010359	0.000987	0.011574	0.021193	0.000987	0.001973	0.001727	...	0.000493	0.042140



# Final Result – Recommend Category for each Neighborhood

	neighborhood	1st recommended category	2nd recommended category	3rd recommended category
0	CAKUNG	Pizza Place	Japanese Restaurant	Seafood Restaurant
1	CEMPAKA PUTIH	Pizza Place	Seafood Restaurant	Steakhouse
2	CENGKARENG	Steakhouse	Pizza Place	Sushi Restaurant
3	CILANDAK	Seafood Restaurant	Steakhouse	Sushi Restaurant
4	CILINCING	Seafood Restaurant	Japanese Restaurant	Steakhouse
5	CIPAYUNG	Seafood Restaurant	Sushi Restaurant	Vegetarian / Vegan Restaurant
6	CIRACAS	Pizza Place	Seafood Restaurant	Steakhouse
7	DUREN SAWIT	Seafood Restaurant	Steakhouse	Padangnese Restaurant
8	GAMBIR	Pizza Place	Steakhouse	Sushi Restaurant
9	GROGOL PETAMBURAN	Seafood Restaurant	Pizza Place	Steakhouse
10	JAGAKARSA	Seafood Restaurant	Pizza Place	Steakhouse
11	JATINEGARA	Indonesian Meatball Place	Padangnese Restaurant	Pizza Place
12	JOHAR BARU	Pizza Place	Seafood Restaurant	Steakhouse
13	KALIDERES	Seafood Restaurant	Steakhouse	Padangnese Restaurant
14	KEBAYORAN BARU	Japanese Restaurant	Pizza Place	Steakhouse
15	KEBAYORAN LAMA	Japanese Restaurant	Pizza Place	Steakhouse
16	KEBON JERUK	Seafood Restaurant	Indonesian Restaurant	Japanese Restaurant
17	KELAPA GADING	Pizza Place	Steakhouse	Vegetarian / Vegan Restaurant
18	KEMAYORAN	Pizza Place	Seafood Restaurant	Steakhouse
19	KEMBANGAN	Seafood Restaurant	Japanese Restaurant	Steakhouse
20	KOJA	Seafood Restaurant	Pizza Place	Steakhouse
21	KRAMAT JATI	Pizza Place	Steakhouse	Middle Eastern Restaurant
22	MAKASAR	Seafood Restaurant	Steakhouse	Sushi Restaurant
23	MAMPANG PRAPATAN	Japanese Restaurant	Pizza Place	Steakhouse
24	MATRAMAN	Padangnese Restaurant	Pizza Place	Seafood Restaurant
25	MENTENG	Pizza Place	Seafood Restaurant	Steakhouse
26	PADEMANGAN	Pizza Place	Seafood Restaurant	Steakhouse
27	PALMERAH	Steakhouse	Seafood Restaurant	Sushi Restaurant