OPEN BUSINESS AT SOUTH KOREA - SEOUL
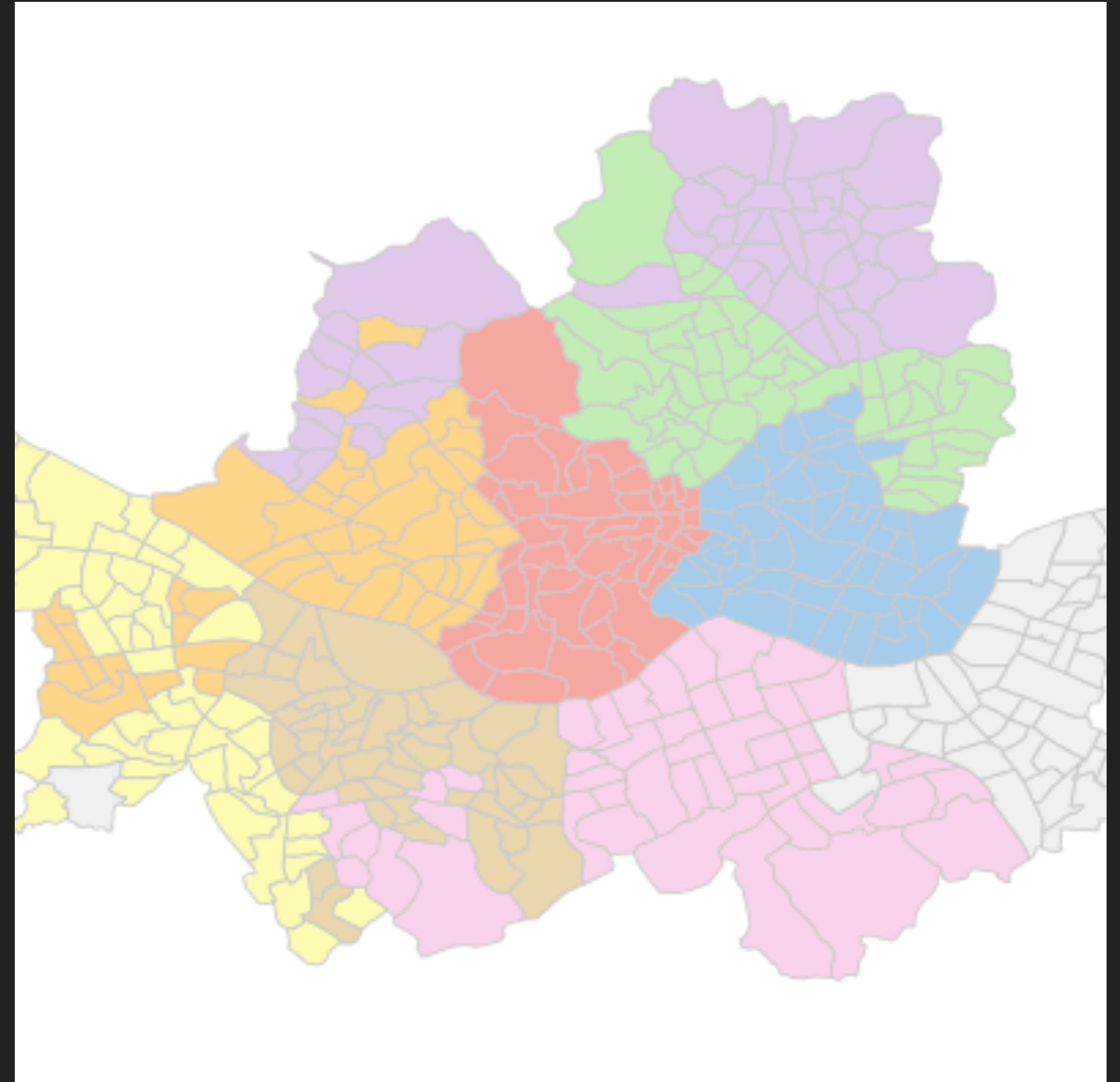
YOO, HEEJUN

THE BATTLE OF THE NEIGHBORHOOD

INTRODUCTION

▸ Seoul, officially the Seoul Special City, is the capital and largest metropolis of South Korea.

▸ It will proceed pre-analysis of market before Business Open in Seoul

▸ Various information & factors need to be utilized for the above insight.

1. Geolocation Data of Seoul District, Neighborhood

2. Living Population Data of Seoul by District, Neighborhood

3. Geolocation Data of Seoul Venues

   • Any convenient venues located nearby the place?

   • Any competitors are located nearby the place?

4. Segmentation of the Seoul District

DATA 1: SEOUL GEOLOCATION DATA WITH DISTRICT, NEIGHBORHOOD

▸ Seoul has 25 Districts and 425 Neighborhoods.

▸ Data source link is (https://github.com/vuski/admdongkor/blob/master/ver20200101/HangJeongDong_ver20200101.geojson)

	city	District	Neighborhood	adm_cd2	long	lat	geometry	coordinates	Areacode
0	서울특별시	종로구	사직동	1111053000	126.970144	37.574108	MULTIPOLYGON (((126.97689 37.57565, 126.97703 ...	[[126.97688884274817, 37.575650779448786], [12...	11110530
1	서울특별시	종로구	삼청동	1111054000	126.981114	37.588013	MULTIPOLYGON (((126.98269 37.59507, 126.98337 ...	[[126.98268938649305, 37.5950655194224], [126....	11110540
2	서울특별시	종로구	부암동	1111055000	126.962557	37.596699	MULTIPOLYGON (((126.97585 37.59656, 126.97359 ...	[[126.97585113775686, 37.59656422224408], [126...	11110550
3	서울특별시	종로구	평창동	1111056000	126.969274	37.613965	MULTIPOLYGON (((126.97507 37.63139, 126.97649 ...	[[126.97507466788086, 37.63138628651299], [126...	11110560
4	서울특별시	종로구	무악동	1111057000	126.958989	37.577741	MULTIPOLYGON (((126.96067 37.58080, 126.96281 ...	[[126.96067353273895, 37.580797842029725], [12...	11110570

DATA 2: SEOUL LIVING POPULATION BY DATETIME, AGE, DISTRICT, NEIGHBORHOOD

▸ As part of the South Korea big data project, Government has signed contract with **Korea telecommunication companies** like KT, SKT, LGT, and gathered living population data with them.

▸ Data source is available from (http://data.seoul.go.kr/dataList/OA-15439/S/1/datasetView.do)

	Date	Hour	Areacode	Total	male_0to9	male_10to14	male_15to19	male_20to24	male_25to29	male_30to34	...	female_25to29
0	20200326	0	11110515	14739.7793	529.2775	337.2565	435.8153	706.6689	509.0460	406.4775	...	469.8208
1	20200326	0	11110530	14253.1012	326.4137	145.0726	220.0557	430.0698	513.6943	541.8583	...	532.2772
2	20200326	0	11110540	4542.9356	78.4293	60.0954	139.9614	393.9535	153.0175	180.0634	...	123.0728
3	20200326	0	11110550	16053.9286	467.9358	362.8310	426.2707	510.7543	458.0618	383.8269	...	442.4556
4	20200326	0	11110560	19814.0498	526.4606	380.8060	634.5152	650.6258	539.8961	396.1611	...	486.8294

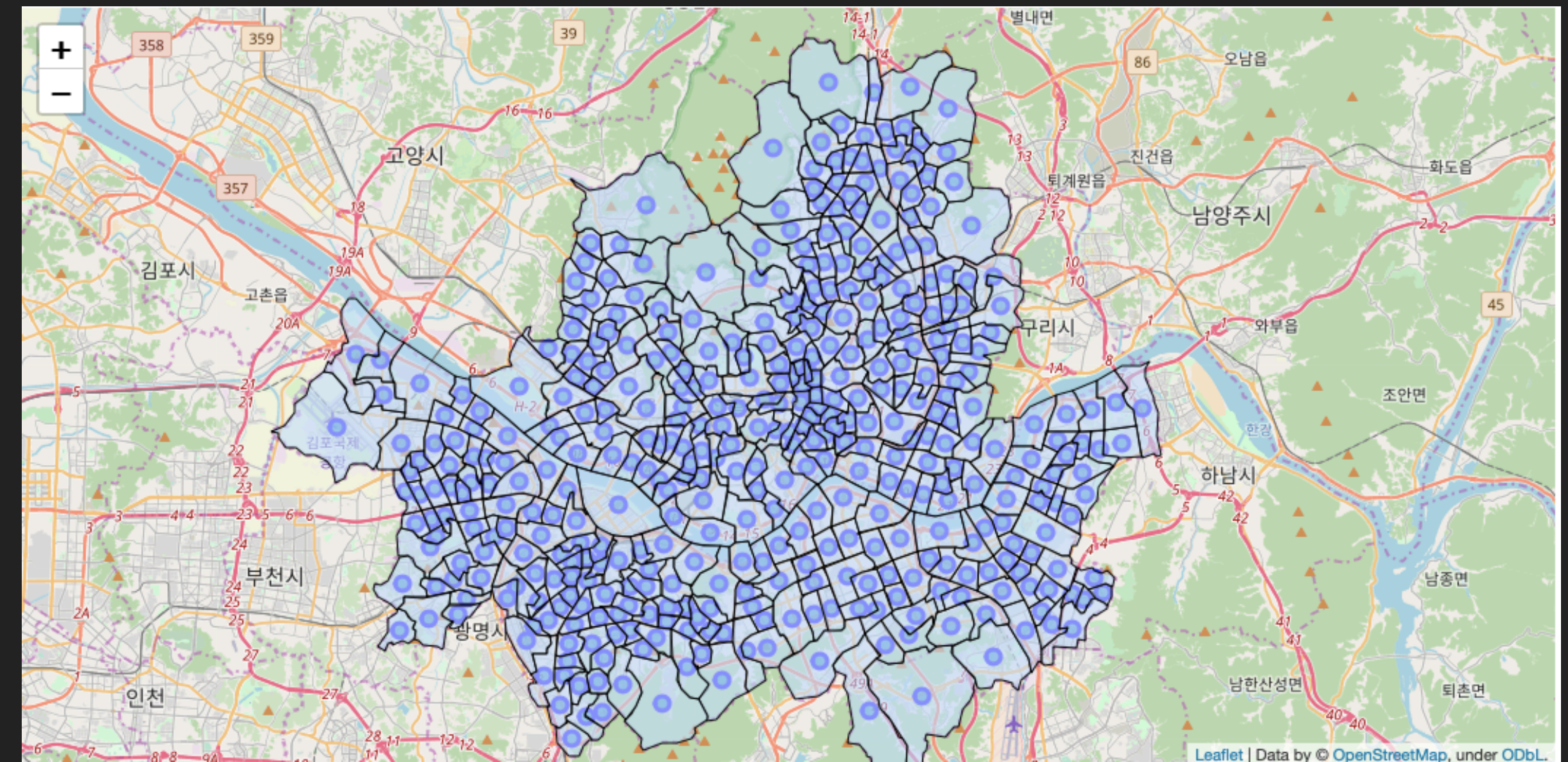# DATA 3: SEOUL GEOGRAPHICAL COORDINATES DATA FROM FOURSQUARE

▸ Foursquare API will be utilized to gather data of geolocation, various venue data like category, name geolocation and etc.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	가락1동	Fish Market	Farmers Market	Zoo	Ethiopian Restaurant	Exhibit	Farm	Fast Food Restaurant	Flea Market	Flower Shop	Food
1	가락2동	Bakery	Fast Food Restaurant	Coffee Shop	Bus Stop	Seafood Restaurant	Park	Noodle House	Chinese Restaurant	Café	Donut Shop
2	가락본동	Korean Restaurant	BBQ Joint	Coffee Shop	Ramen Restaurant	Japanese Restaurant	Noodle House	Donut Shop	Dessert Shop	Pizza Place	Chinese Restaurant
3	가리봉동	Coffee Shop	Outlet Store	Fast Food Restaurant	Korean Restaurant	Indian Restaurant	Women's Store	Bakery	Bubble Tea Shop	Buffet	BBQ Joint
4	가산동	Coffee Shop	Korean Restaurant	Outlet Store	Fast Food Restaurant	Bakery	Vietnamese Restaurant	Noodle House	Chinese Restaurant	BBQ Joint	Taco Place
5	가양1동	Botanical Garden	Gym	Café	Gym / Fitness Center	Art Gallery	Forest	Food Truck	Food Court	Food & Drink Shop	Food
6	가양2동	Fried Chicken Joint	Playground	Trail	Flea Market	Event Space	Exhibit	Farm	Farmers Market	Fast Food Restaurant	Fish Market
7	가양3동	Park	Convenience Store	Performing Arts Venue	Korean Restaurant	Trail	Food Court	Food & Drink Shop	Food	Flower Shop	Flea Market
8	가회동	Korean Restaurant	Café	Coffee Shop	Italian Restaurant	Tea Room	Seafood Restaurant	Bakery	Steakhouse	Historic Site	Dessert Shop
9	갈현1동	Café	Restaurant	Bus Stop	Pizza Place	Fast Food Restaurant	Bunsik Restaurant	Zoo	Flea Market	Farm	Farmers Market
10	갈현2동	Park	Sushi Restaurant	Fast Food Restaurant	Bakery	Fountain	Forest	Food Truck	Food Court	Food & Drink Shop	Ethiopian Restaurant
11	강일동	Ice Cream Shop	Baseball Field	Café	Donut Shop	Bakery	Zoo	Flea Market	Farm	Farmers Market	Fast Food Restaurant
12	개봉1동	Market	Event Space	Hotel	Korean Restaurant	Flea Market	Exhibit	Farm	Farmers Market	Fast Food Restaurant	Fish Market
13	개봉2동	Ice Cream Shop	Electronics Store	Department Store	Donut Shop	Zoo	Flower Shop	Farm	Farmers Market	Fast Food Restaurant	Fish Market
14	개봉3동	Sushi Restaurant	River	Mobile Phone Shop	Zoo	Flower Shop	Exhibit	Farm	Farmers Market	Fast Food Restaurant	Fish Market
15	개포1동	Café	Grocery Store	Auto Garage	Korean Restaurant	Zoo	Farm	Farmers Market	Fast Food Restaurant	Fish Market	Flea Market
16	개포2동	Bunsik Restaurant	Ice Cream Shop	Basketball Court	Donut Shop	Zoo	Farmers Market	Fast Food Restaurant	Fish Market	Flea Market	Flower Shop
17	개포4동	Korean Restaurant	Chinese Restaurant	Intersection	Café	Noodle House	Coffee Shop	Zoo	Flea Market	Farm	Farmers Market
18	거여1동	Ice Cream Shop	Café	Korean Restaurant	Sake Bar	Bakery	Flea Market	Exhibit	Farm	Farmers Market	Fast Food Restaurant

METHDOLOGY - DATA 1

▸ Data is provided with GeoJSON format from github.

▸ Data is loaded by Geo Pandas - read file function as Data Frame

▸ This Data Frame is including

  ▸ District, Neighborhood name and government management code

  ▸ Geometry data by multipolygon lat, long

▸ Using centroid function to get the center point of geolocation multipolygon data

▸ Using Folium to visualize Seoul district, neighborhood data into map

▸ Foursquare API will be utilized to get venue data

METHDOLOGY - DATA 2

▸ Data is provided by CSV format from data.seoul.go.kr

▸ CSV file size is over 100 MB, and it will stored into cloud database - IBM DB2

▸ Data is loaded into cloud db, and call data through SQL from jupyter notebook

▸ This data is including

  ▸ Date, Hour as datetime data

  ▸ Areacode for neighborhood identifier which is defined by South Korea Government

  ▸ Total population at the date and time

  ▸ population of male/female separated by age range

METHDOLOGY - DATA 2 - WORKING HOUR LIVING POPULATION

▸ Based on living population data within Working Hour, Top 100 Neighborhoods contains 45 percent of total population.

▸ 38 % of above Top 100 population are from only 4 Districts.

   ▸ Gang-nam, Seo-cho, Song-pa and Gang-seo

▸ 20 % of Top 100 population are also from only 4 Districts.

   ▸ No-won, Dong-jak, Ma-po, Gu-ro

▸ It shows that Major business neighborhoods of Seoul are located at the above districts.

   ▸ 58 % of Top100 population

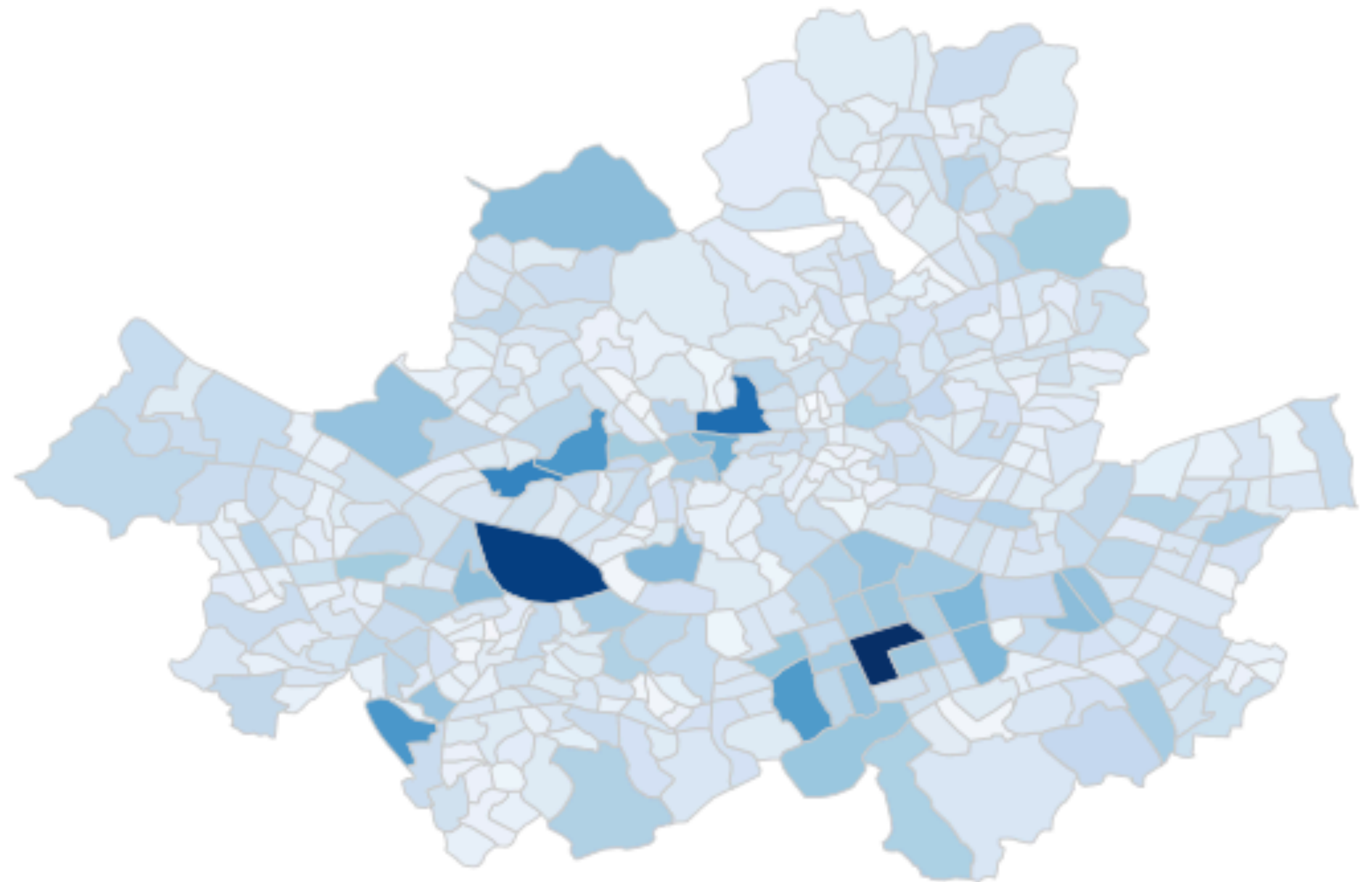▸ However, it also shows that some specific Neighborhoods which are not in above listed districts.

METHDOLOGY - DATA 2 – WORKING HOUR LIVING POPULATION

▸ Top 5 Neighborhood

  ▸ 역삼1동 - Yeok-sam 1dong (Gang-nam)

  ▸ 여의동 - Yeo-ui dong

  ▸ 종로1·2·3·4가동 - Jong-ro 1.2.3.4 dong

  ▸ 서교동 - Se-kyo dong (Hong Dae)
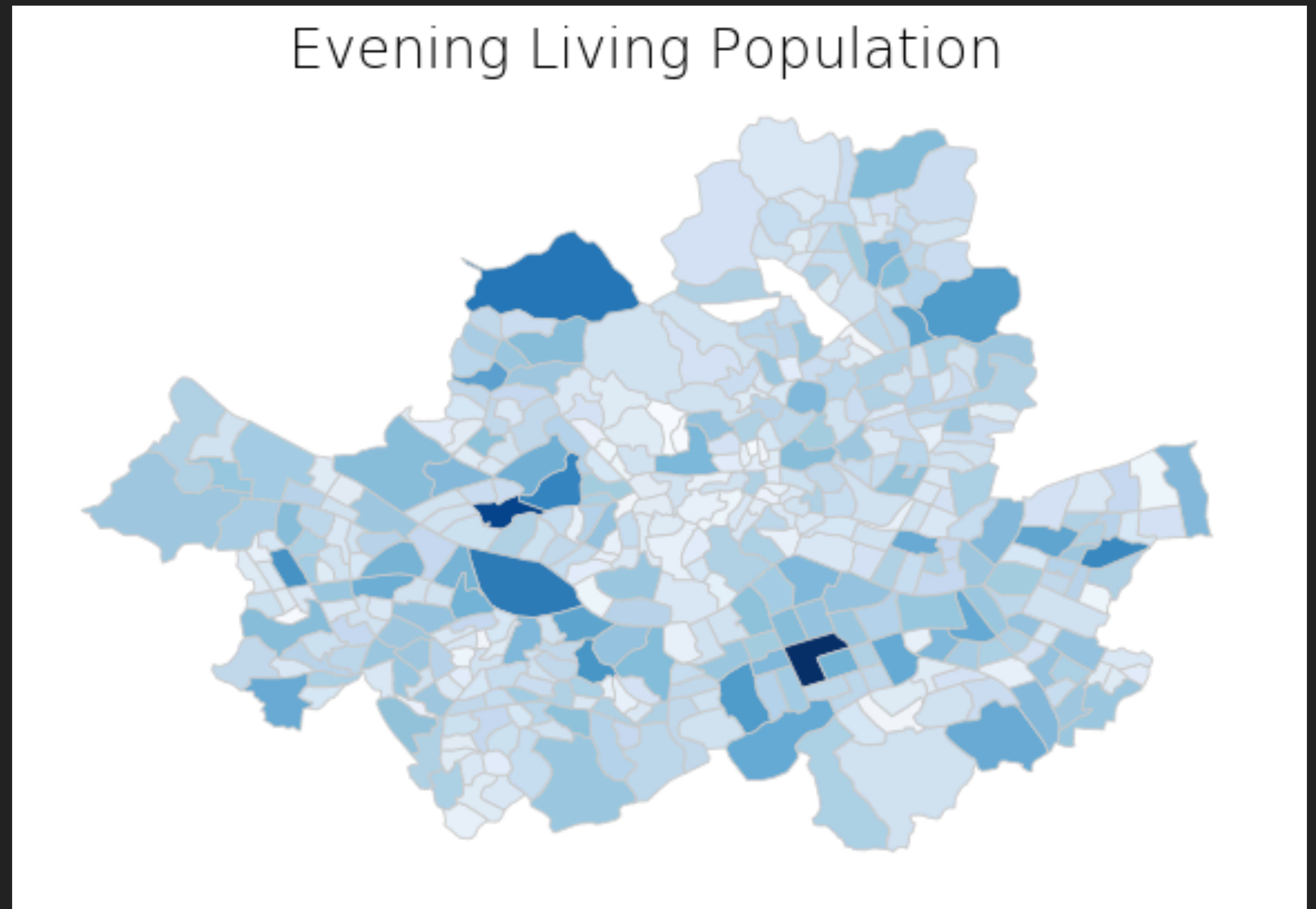
  ▸ 가산동 - Ga-san dong

Working Hour Living Population

METHDOLOGY - DATA 2 - EVENING HOUR LIVING POPULATION

▸ Based on living population data after working hour, Top 100 Neiborhoods contains 38 percent of total population.

▸ Mainly, listed districts are similar as major business districts, but highest district is different.

  ▸ Song-pa is the highest district of this data value.

  ▸ Based on data, we can say that if employees need to spend time after working hour, they are spending time at the place where near their companies.

▸ Some specific neighborhoods which are not listed in above districts list, are hot places of Seoul to spend evening time.

  ▸ like hong-dae, sin-chon

METHDOLOGY - DATA 2 - EVENING HOUR LIVING POPULATION

▸ Top 5 Neighborhood

  ▸ 역삼1동 - Yeok-sam 1dong (Gang-nam)

  ▸ 서교동 - Se-kyo dong (Hong Dae)

  ▸ 진관동 - Jin-Gwan dong

  ▸ 여의동 - Yeo-ui dong

  ▸ 신촌동 - Sin-Chon dong

Evening Living Population
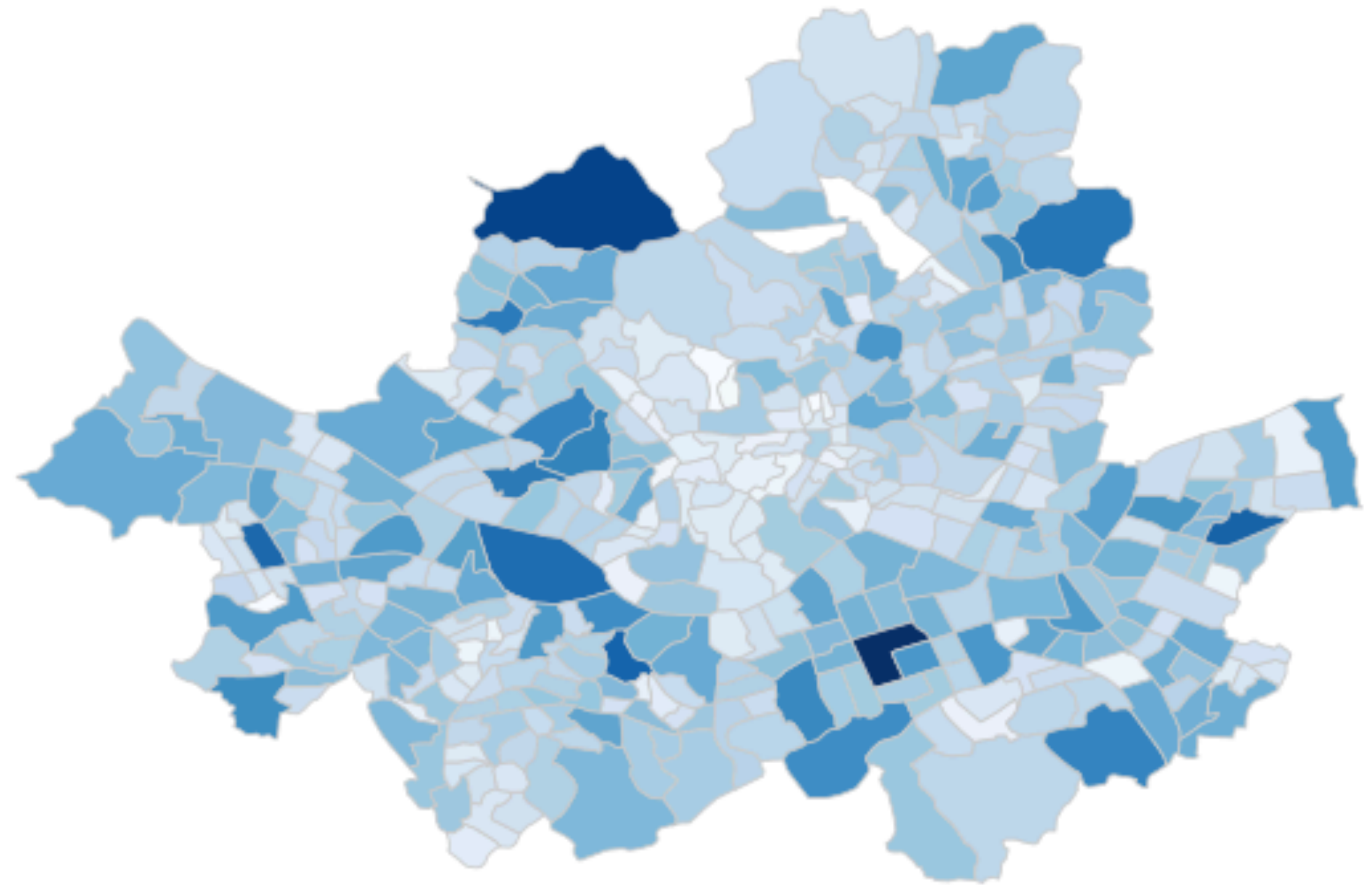
METHDOLOGY - DATA 2 - DAWN TIME LIVING POPULATION

▸ Based on living population data in Dawn time, Top 100 Neighborhoods contains 38 percent of total population.

▸ Listed districts are almost same as above - after working hour data.

▸ Hot places of Seoul still shows high population value in dawn time.

METHDOLOGY - DATA 2 - DAWN TIME LIVING POPULATION

▸ Top 5 Neighborhood

  ▸ 역삼1동 - Yeok-sam 1dong (Gang-nam)

  ▸ 진관동 - Jin-Gwan dong

  ▸ 길동 - Gil-dong

  ▸ 상도1동 - Sang-do 1dong

  ▸ 화곡1동 - Hwa-gok 1dong

Dawn time Living Population

METHDOLOGY - DATA 3

▸ Geolocation data is utilized as input for the Foursquare API

▸ Set python function to get venue data

▸ one hot encoding of all venue categories from Neighborhood, and calculate mean of category

▸ based on above result, get highest 10 venues

RESULT - BUSINESS AREA

▸ Clustered by nearby common venue

  ▸ Coffee shop, Restaurant, Stores or Activity, Natural environment

▸ Top 5 Neighborhood Analyze

  ▸ 역삼1동 - Yeok-sam 1dong (Gang-nam)

    ▸ High Risk, High Return Area to start business. Venues are placed commensurately.

    ▸ You can consider to open activity business in this area.

  ▸ 여의동 - Yeo-ui dong

    ▸ You can consider to open Korean Restaurant in this area.

    ▸ Coffee shop is not recommended.

  ▸ 종로1·2·3·4가동 - Jong-ro 1.2.3.4 dong

    ▸ You can consider to open Japanese Restaurant in the area.

  ▸ 서교동 - Se-kyo dong (Hong Dae)

    ▸ Similar with Gang-nam. You can consider to open activity business in this area.

  ▸ 가산동 - Ga-san dong

    ▸ Venues are placed commensurately.

RESULT – BUSINESS AREA

District	Neighborhood	Areacode	Total	Per	long	lat	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
강남구	역삼1동	11680640	53324868	1.297123	127.035491	37.500889	2	Korean Restaurant	BBQ Joint	Coffee Shop	Chinese Restaurant	Hotel	Japanese Restaurant	Salad Place	Sushi Restaurant	Italian Restaurant	Sake Bar
영등포구	여의동	11560540	49989377	1.215987	126.927571	37.527489	0	Coffee Shop	Park	Café	Plaza	BBQ Joint	Korean Restaurant	Night Market	Japanese Restaurant	Hotel	Metro Station
종로구	종로1·2·3·4가동	11110615	41123842	1.000334	126.989733	37.575077	2	Korean Restaurant	Tea Room	Café	Coffee Shop	Dumpling Restaurant	Beer Bar	Restaurant	Italian Restaurant	Museum	Hostel
마포구	서교동	11440660	36206535	0.880721	126.920945	37.554772	0	Korean Restaurant	Coffee Shop	Café	BBQ Joint	Dessert Shop	Chinese Restaurant	Japanese Restaurant	Bar	Bakery	Hotel
금천구	가산동	11545510	31985589	0.778047	126.884341	37.476835	0	Coffee Shop	Korean Restaurant	Outlet Store	Fast Food Restaurant	Sporting Goods Shop	Chinese Restaurant	Steakhouse	Bakery	BBQ Joint	Japanese Restaurant

RESULT - HOT PLACE AREA

▸ Clustered by nearby common venue

  ▸ Coffee shop, Restaurant, Stores or Activity, Natural environment

▸ Top 5 Neighborhood Analyze

  ▸ 역삼1동 - Yeok-sam 1dong (Gang-nam)

    ▸ Same as Business Area clustering information.

  ▸ 서교동 - Se-kyo dong (Hong Dae)

    ▸ Same as Business Area clustering information.

  ▸ 진관동 - Jin-Gwan dong

    ▸ You can consider to open Restaurant business in this area. Any Cuisine can be considered.

  ▸ 여의동 - Yeo-ui dong

    ▸ Same as Business Area clustering information.

  ▸ 신촌동 - Sin-Chon dong

    ▸ You can consider to open acvitity business in this area.

RESULT - HOT PLACE AREA

District	Neighborhood	Areacode	Total	Per	long	lat	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
강남구	역삼1동	11680640	16311045	0.819234	127.035491	37.500889	3	Korean Restaurant	BBQ Joint	Coffee Shop	Chinese Restaurant	Hotel	Japanese Restaurant	Café	Sake Bar	Salad Place	Sushi Restaurant
마포구	서교동	11440660	15038708	0.755330	126.920945	37.554772	2	Korean Restaurant	Coffee Shop	Café	BBQ Joint	Dessert Shop	Chinese Restaurant	Bakery	Hotel	Bar	Japanese Restaurant
은평구	진관동	11380690	12087829	0.607120	126.940518	37.639279	1	Coffee Shop	Bakery	Planetarium	Café	Museum	Bistro	Trail	Food Truck	Food Court	Food & Drink Shop
영등포구	여의동	11560540	11818434	0.593589	126.927571	37.527489	2	Coffee Shop	Park	Café	Korean Restaurant	Japanese Restaurant	Hotel	BBQ Joint	Night Market	Plaza	Fried Chicken Joint
서대문구	신촌동	11410585	11114291	0.558223	126.941063	37.563636	1	Coffee Shop	Korean Restaurant	Bakery	Bubble Tea Shop	Donut Shop	Dessert Shop	Sandwich Place	Japanese Restaurant	French Restaurant	Multiplex

RESULT - DAWN AVAILABLE AREA

▸ Clustered by nearby common venue

  ▸ Coffee shop, Restaurant, Stores or Activity, Natural environment

▸ Top 5 Neighborhood Analyze

  ▸ 역삼1동 - Yeok-sam 1dong (Gang-nam)

    ▸ Same as Business Area clustering information.

  ▸ 진관동 - Jin-Gwan dong

    ▸ Same as Hot Place Area clustering information.

  ▸ 길동 - Gil-dong

    ▸ You can consider to start Coffee shop business in this area, but 24 open.

  ▸ 상도1동 - Sang-do 1dong

  ▸ 화곡1동 - Hwa-gok 1dong

    ▸ You can consider to start Coffee shop business in this area, but 24 open.

RESULT – DAWN AVAILABLE AREA

District	Neighborhood	Areacode	Total	Per	long	lat	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
강남구	역삼1동	11680640	13317512	0.676090	127.035491	37.500889	3	Korean Restaurant	BBQ Joint	Coffee Shop	Chinese Restaurant	Hotel	Japanese Restaurant	Café	Italian Restaurant	Sushi Restaurant	Sake Bar
은평구	진관동	11380690	12262365	0.622523	126.940518	37.639279	2	Bakery	Coffee Shop	Café	Museum	Planetarium	Bistro	Trail	Food	Flea Market	Fish Market
강동구	길동	11740685	10838712	0.550249	127.145907	37.539725	3	Korean Restaurant	Flea Market	Noodle House	Bus Stop	Bakery	Yoga Studio	Food Court	Food	Fish Market	Fast Food Restaurant
동작구	상도1동	11590530	10614079	0.538845	126.953470	37.498329	3	Coffee Shop	Korean Restaurant	Sandwich Place	Ice Cream Shop	Fast Food Restaurant	Pizza Place	Gym / Fitness Center	Dumpling Restaurant	Donut Shop	Flea Market
강서구	화곡1동	11500540	10526261	0.534387	126.840936	37.533780	0	Bakery	Ice Cream Shop	Pizza Place	Bus Station	Grocery Store	Market	Yoga Studio	Food	Flea Market	Fish Market

DISCUSSION & CONCLUSION

▸ 역삼1동 - Yeok-sam 1dong (Gang-nam) is the place with highest population value not only in business hour, but also in other times.

▸ Korean Restaurant and Coffee shop are highest common venues from most of places.

▸ Recommended Business can be listed as above.

▸ The report is generated on limited data only. There are many options can be added to get more information, like estate data, employee satisfied result and so on. It can be improved if better quality of data is available.

▸ Gang-Nam, Yeo-ui, Hong-dae are places where having competitive market, but at the same time there have high potential to success with many options.