



Kyoto is attractive place for tourists

Kyoto is the former capital city of Japan and world-famous for its refined culture, dining, and charm of rural Japan

Kyoto City attracts millions of local and international visitors each year looking for traditional Japanese culture. Temples and shrines such as Kiyomizudera Temple and Kinkakuji draw lots of attention from visitors, as do the bamboo groves of nearby Arashiyama. Stay in a traditional ryokan, take a dip in a rejuvenating onsen, and enjoy the seasonal changes of cherry blossoms and brilliant autumn foliage.

Group 5 project: Open Kyoto for international tourists.

Project objectives:

1. Create a criteria of the best restaurant based on the data provided

2. Make a statistical analysis of the data to choose 25 best restaurants in Kyoto

3. Find 10 attractive places in Kyoto and offer the best restaurants located near these historical and cultural places from the selected list above.

4. Make recommendations for upcoming visitors for best attractions and food pricing and quality.

Resources: 1. Rest_Ky.csv, 2. Google, 3. API.Geoapify.com

Part A: Technical work with datasets:

1. Cleaning the restaurant dataset

```
Kyoto_res=Kyoto_res.drop(columns=['Unnamed: 0.1', 'Unnamed: 0', 'FirstCategory', 'SecondCategory', 'LunchPriceLow', 'LunchPriceHigh'])
```

The screenshot shows a Visual Studio Code interface with a Python script named `Kyoto.ipynb`. The code reads a CSV file and drops several columns. Arrows point from the removed columns ('FirstCategory', 'SecondCategory', 'LunchPriceLow', 'LunchPriceHigh') to the resulting clean DataFrame.

```
File Edit Selection View Go Run Terminal Help
Welcome Kyoto.ipynb pymaceuticals.ipynb Kyoto_new.ipynb
Kyoto.ipynb > # Read the restaurant data and the study results
+ Code + Markdown | ▶ Run All | Clear All Outputs | Restart | Variables | Outline
Kyoto_res=pd.read_csv("attract_kyoto.csv",encoding="ISO-8859-1")
Kyoto_res.head(10)
Kyoto_res=Kyoto_res.drop(columns=['Unnamed: 0.1','Unnamed: 0','FirstCategory','SecondCategory','LunchPriceLow','LunchPriceHigh'])

#Kyoto_res.head()
#Kyoto_res.dropna()
Kyoto_res=Kyoto_res.dropna(subset=['DinnerPriceLow','DinnerPriceHigh'])

Kyoto_rest['Price']=pd.to_numeric(Kyoto_rest['Price'], errors='coerce')
```

	Unnamed: 0.1	Unnamed: 0	Name	Station	FirstCategory	SecondCategory	TotalRating	ReviewNum	Lat	Long	Category	DinnerPriceLow	DinnerPriceHigh	LunchPriceLow	LunchPriceHigh
0	0	1	Orudeidainingurajou	Kyoto	Buffet style	Cafe	3.39	66	34.986175	135.758114	Buffet style Cafe	¥4000	¥4999	¥2000	¥2999
1	1	2	Steak Frites Gaspard zinzin	Karasuma	Bistro	Steak	3.18	70	35.005826	135.759857	Bistro Steak	¥3000	¥3999	¥1000	¥1999
2	2	3	KAZUMA	Sanjo	Izakaya (Tavern)	Japanese food (other)	3.28	7	35.006583	135.770247	Izakaya (Tavern) Japanese food (other)	¥3000	¥3999	NaN	NaN
3	3	4	Okonomiyaki teppanyaki miki	Tambaguchi	Okonomiyaki	Izakaya (Tavern)	3.14	16	34.995924	135.748267	Okonomiyaki Izakaya (Tavern)	¥3000	¥3999	NaN	NaN
4	4	5	Shaofelyan	Kyoto Shiyakusho Mae	Chinese hot pot / fire pot	Chinese	3.1	23	35.007901	135.768202	Chinese hot pot / fire pot Chinese	¥4000	¥4999	¥1000	¥1999
5	5	6	okuta-va	Kyoto	Bar	Italian	3.08	24	34.983497	135.760559	Bar Italian	¥4000	¥4999	¥1000	¥1999
6	6	7	Resort dining&bar HaLe	Sanjo	Italian	Bar	3.04	22	35.007195	135.769468	Italian Bar	¥3000	¥3999	¥1000	¥1999
7	7	8	Sumika	Kawaramachi	Izakaya (Tavern)	Creative cuisine	3.34	23	35.004704	135.770182	Izakaya (Tavern) Creative cuisine	¥3000	¥4999	NaN	NaN
8	8	9	Gayagaya	Sanjo	Izakaya (Tavern)	Bar	3.03	3	35.007174	135.769968	Izakaya (Tavern) Bar	¥3000	¥3999	NaN	NaN
9	9	10	Ishibekoujimamecha	Gion Shijo	Izakaya (Tavern)	Kyoto Cuisine	3.56	92	35.000813	135.779155	Izakaya (Tavern) Kyoto Cuisine	¥4000	¥4999	NaN	NaN

2. Converting Japanese Yens to US dollars

```
Kyoto_rest['Price']=pd.to_numeric(Kyoto_rest['Price'], errors='coerce')
```

3. Finding the distance between the Kyoto center and other objects

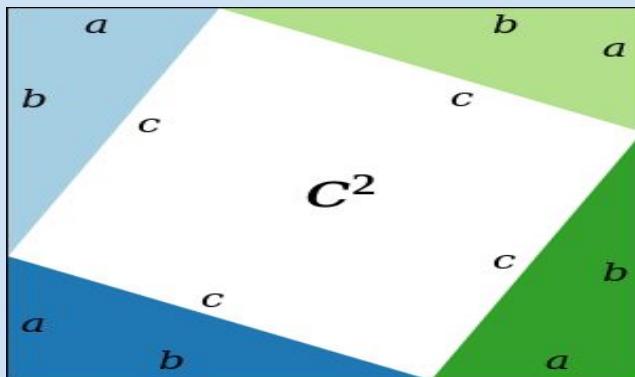
Pythagorean Theorem

latitude 1 deg = 111,300 meters, longitude 1 deg = 91,300 meters (for Latitude = 35),

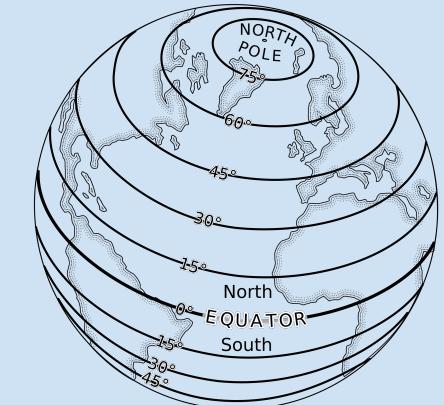
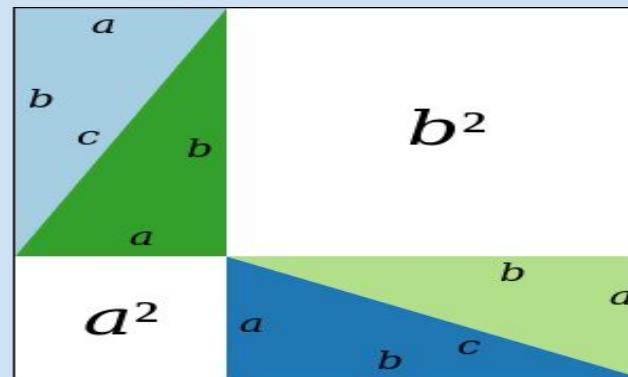
Kyoto center = (35.022655, 135.75726)

def dist(x,y):

```
    return (((111300*(x-35.022655))**2+(91300*(y-135.75726))**2)**0.5).round(decimals = 0)
```



$$c^2 = a^2 + b^2$$



4. Creating a criteria for a new rating:

A new rating is made based on a review number = N :

$$\text{New Rating} = \text{Old Rating} \times \begin{cases} 1 & \text{If } N > Q_3 \text{ (75\%)} \\ 0.85 & \text{If } \text{Median} < N \leq Q_3 \\ 0.8 & \text{If } Q_1 \leq N < \text{Median} \text{ (50\%)} \\ 0.75 & \text{If } N < Q_1 \text{ (25\%)} \end{cases}$$

Hypothesis testing paired t-test indicated very small p-value:

The difference of the means (Old Rating Vs New Rating) is **significant**

Ttest_relResult (statistic = 48.54, p-value = 1.086×10^{-249})

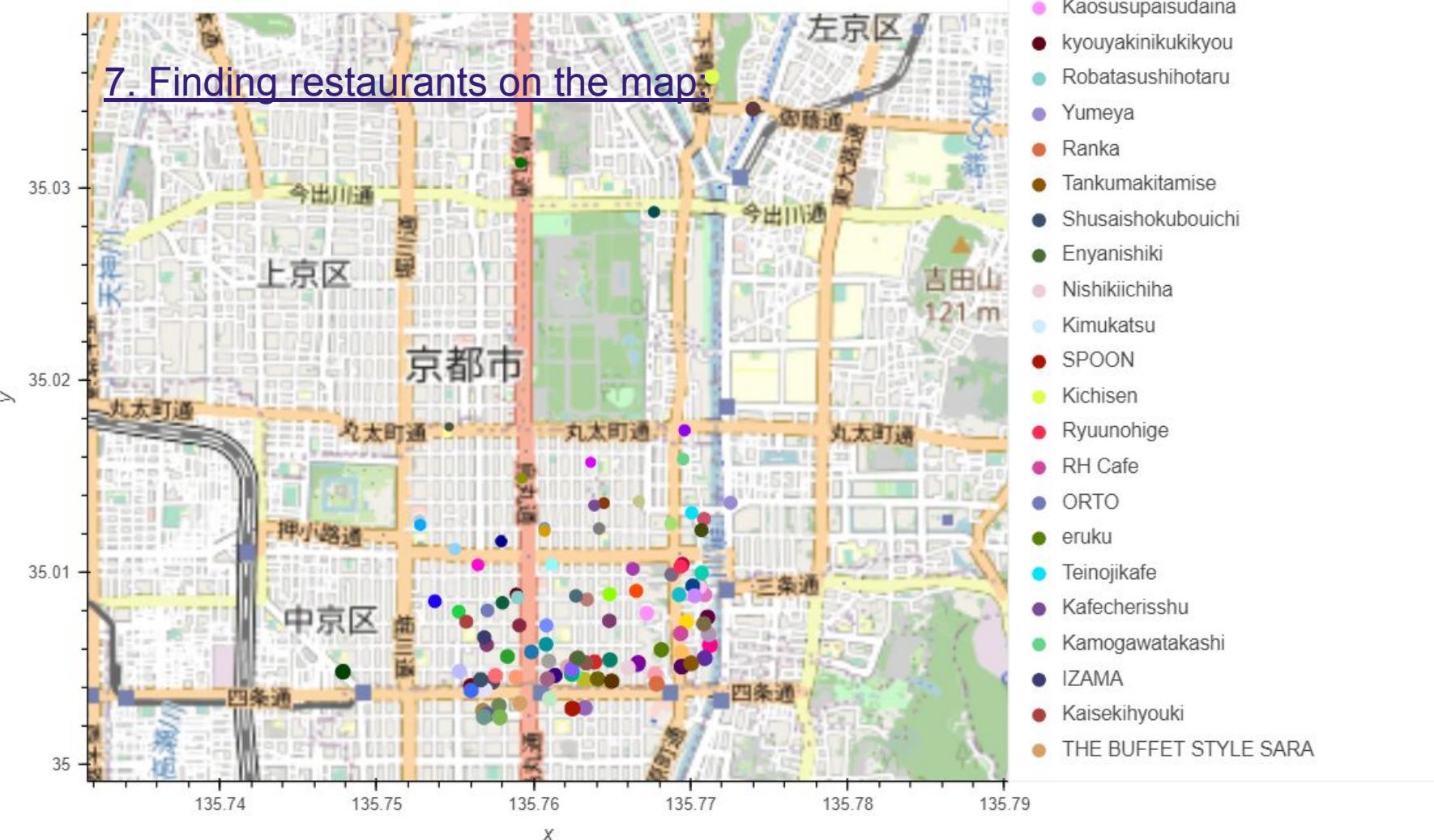
5. Finding ten historical places in Kyoto and creating a dataframe



5. Finding ten historical places on the map:

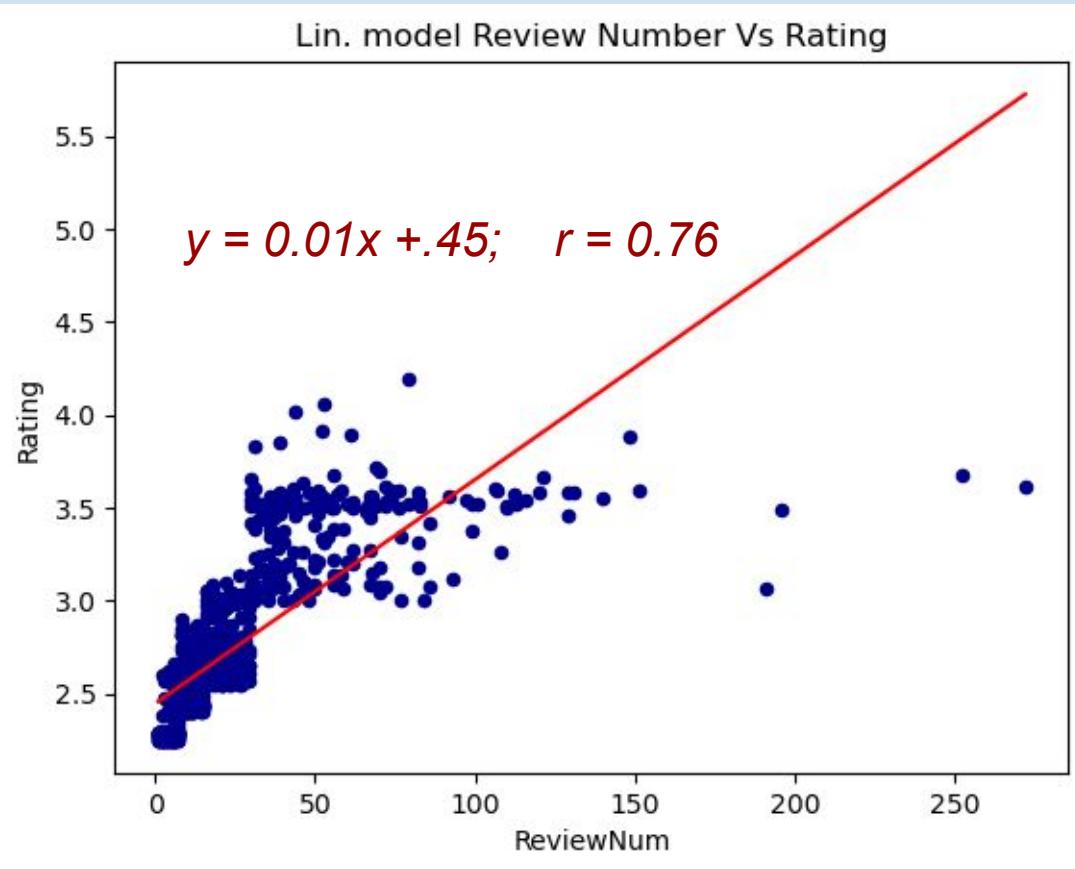


7. Finding restaurants on the map:



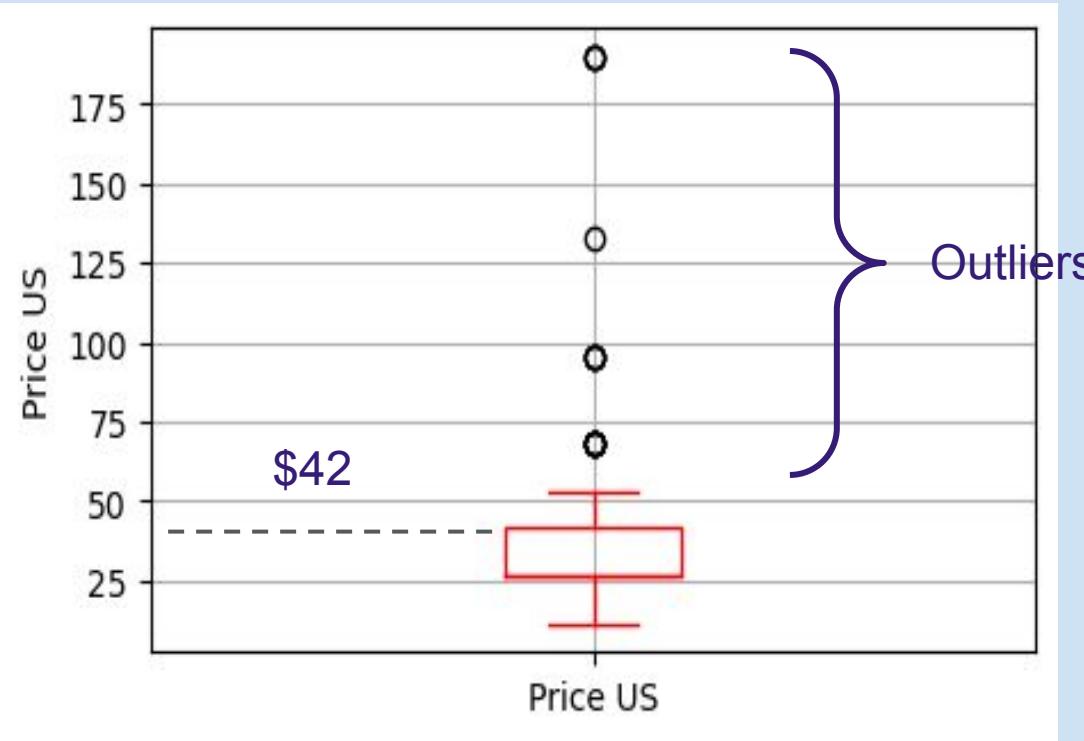
Part B: Statistical Analysis:

1. Choosing restaurants based on stat outcomes



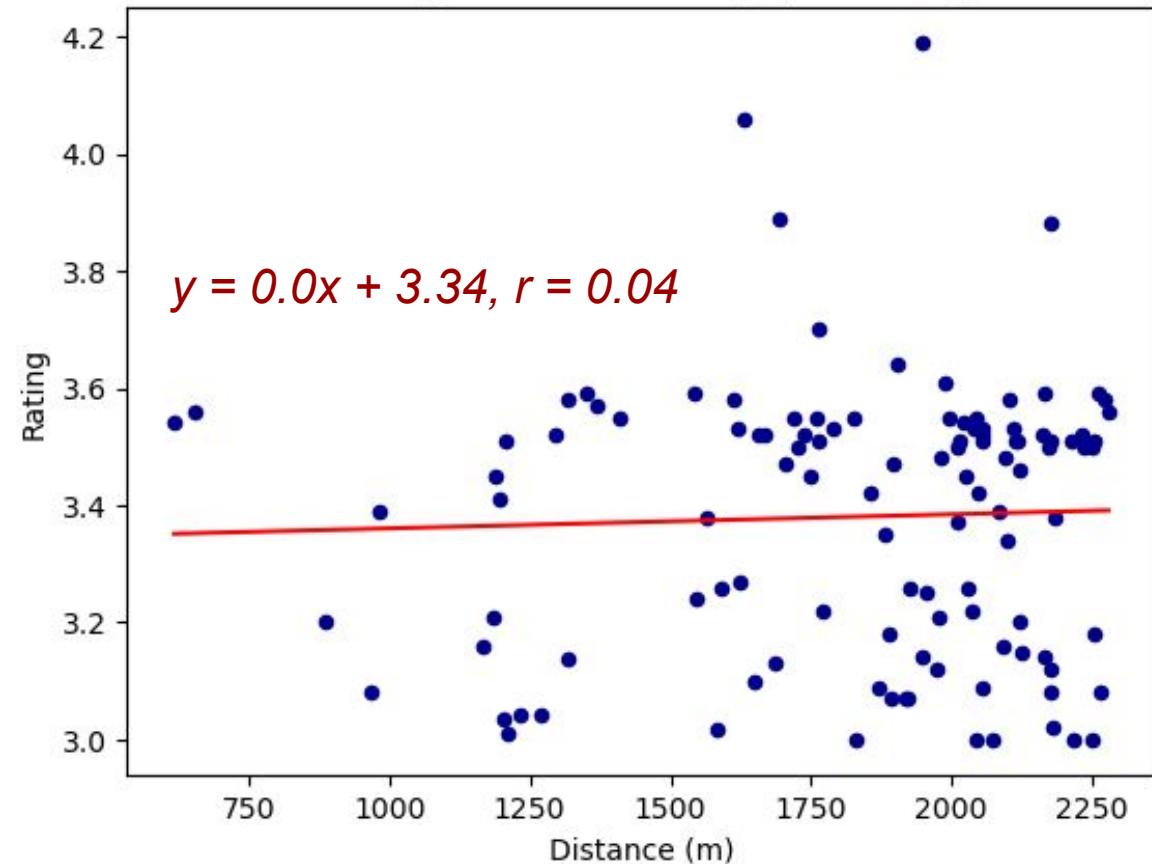
The regression model shows that a new rating is linearly related to a review number

1. Choosing restaurants based on stat outcomes



You shouldn't pay more than \$42 (Q3) for lunch. Four outliers: these restaurants shouldn't be recommended for tourists since they are overpriced. Ideal amount for lunch is around \$27 (Median); not mean since the distribution is positively skewed.

Lin. regression Distance (m) Vs Rating



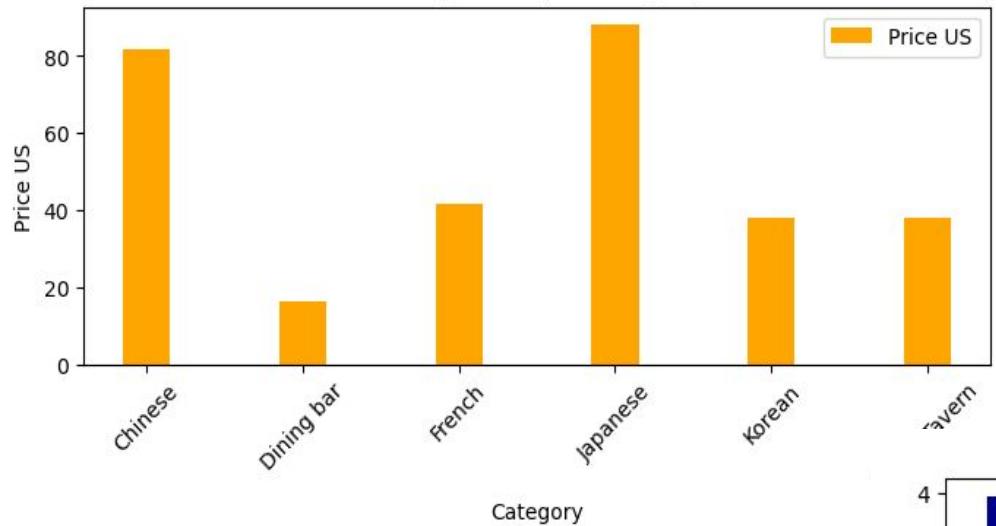
The regression model shows that there is no linear association between Distance (from the center of city to a restaurant) and Rating

	Rating	ReviewNum	Price US	Distance (m)	Lat	Long
count	113	113	113	113	113	113
mean	3.38031	54.920354	38.60151	1823.58407	35.008531	135.763
std	0.235087	29.726474	32.481373	376.917993	0.005902	0.00569
min	3	18	11.3962	617	35.002423	135.748
25%	3.16	35	26.5962	1632	35.004704	135.759
50%	3.46	46	26.5962	1948	35.007212	135.763
75%	3.53	67	41.7962	2103	35.01034	135.769
max	4.19	191	189.9962	2279	35.035797	135.774

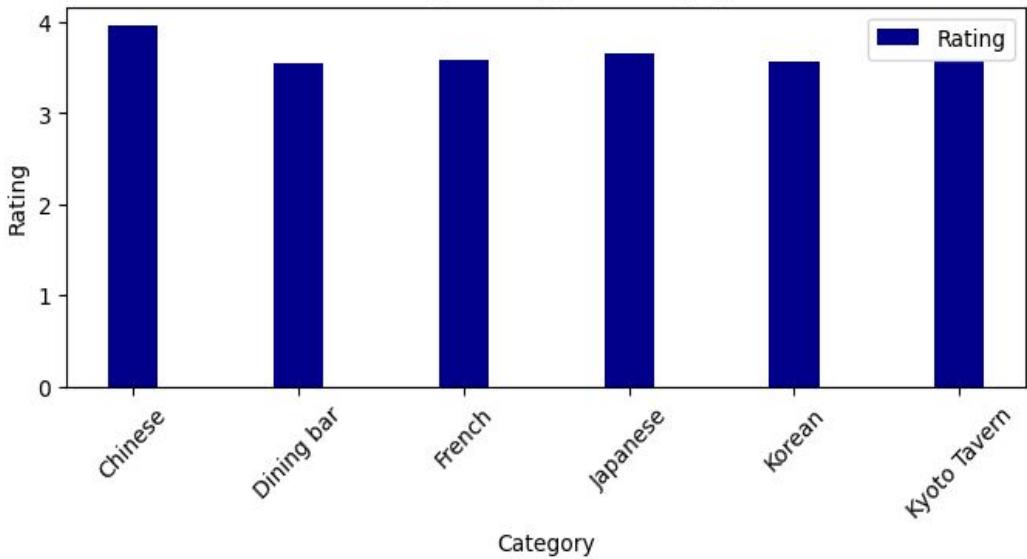
Kyoto_final = Kyoto_final.loc[Kyoto_final ['Rating'] > 3.53,:]

25 best restaurants have been received finally:

Average Price per Category



Average Rating per Category



2. Finding restaurants close to historical places

{'Nijo Castle': [],

'Fushimi-Inari Taisha Shrine': [],

'Kinkaku-ji (The Golden Pavilion)': [],

'Kiyomizu-dera Temple': [],

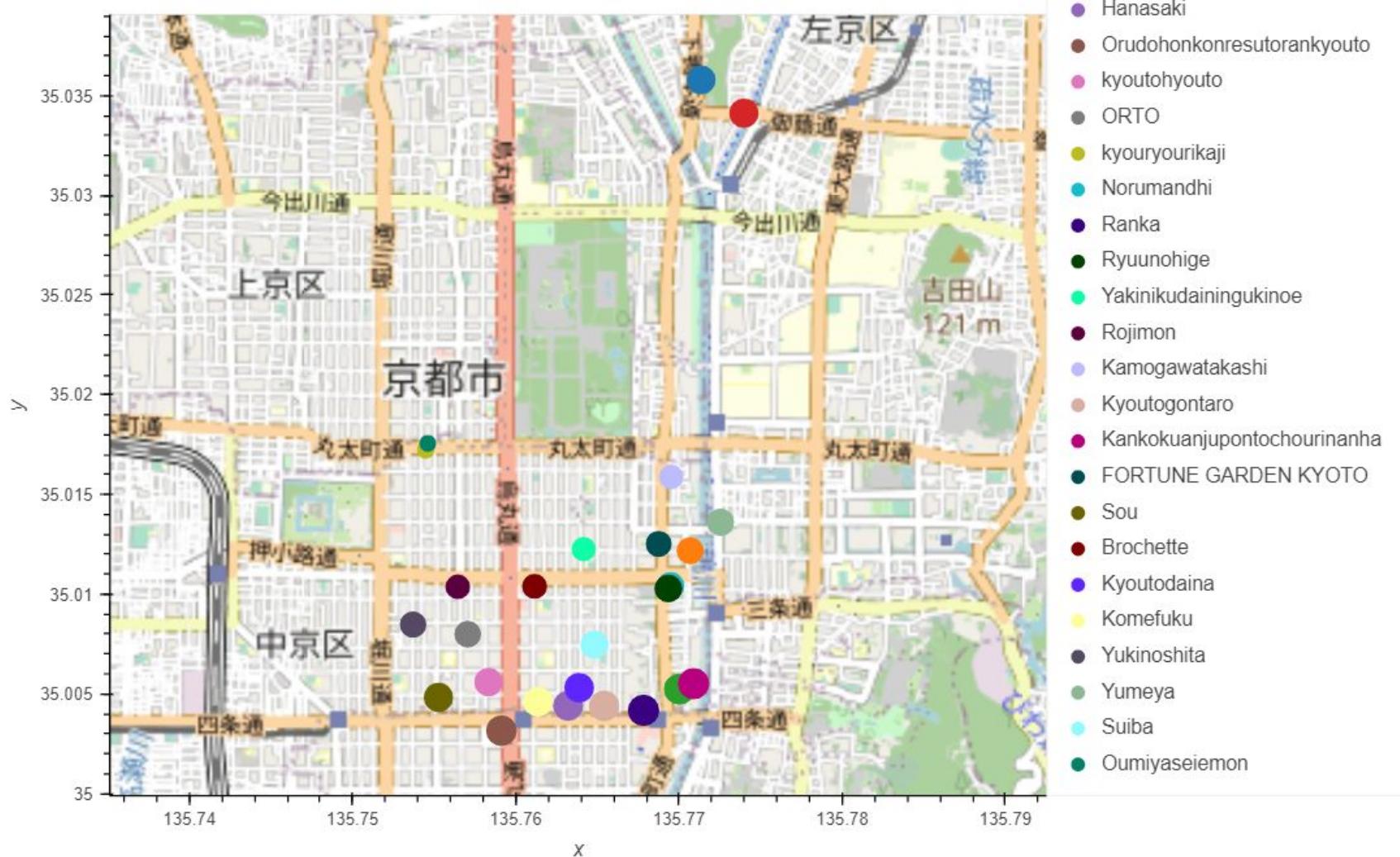
"Gion's Geishas and Temples": ['Tankumakitamise', 'Ranka', 'Kankokuanjupontochourinanha'],

'Arashiyama Monkey Park': [],

'The Kyoto National Museum and Municipal Museum of Art': [],

'Kyoto Samurai and Ninja Museum': ['ORTO', 'nihonryourisakuragawa',

'Orudohonkonresutorankyouto', 'Ryuunohige', 'kyoutohyouto', 'Tankumakitamise',
'Kyoutogontaro', 'FORTUNE GARDEN KYOTO', 'Ranka', 'Kankokuanjupontochourinanha', ...



Name	Description	<u>List of Historical places:</u>	Link	Distance (m)
Nijo Castle	Historic wood castle with gardens		https://nijo-jocastle.city.kyoto.lg.jp/?lang=en	1524
Fushimi-Inari Taisha Shrine	Mountainside Shinto shrine dating from 711 A.D. featuring a path with hundreds of traditional gates		http://inari.jp/en/	6296
Kinkaku-ji (The Golden Pavilion)	Historic tranquil temple with a gold-leaf facade set amid landscaped gardens (a reflecting pond)		https://www.shokoku-ji.jp/en/kinkakuji/	3327
Kiyomizu-dera Temple	Iconic Buddhist temple on Mount Otowa known for the scenic views afforded from its veranda		www.kiyomizudera.or.jp/en/	3877
Gion's Geishas and Temples	Traditional shrines and temples are located throughout the district		https://journeycompass.com/gion-kyoto-guide	2921
Arashiyama Monkey Park	Popular area atop Mt Arashiyama for viewing wild macaque monkeys (sweeping city views)		http://www.monkeypark.jp/eng-index.html	7685
The Kyoto National Museum and Municipal Museum of Art	The Kyoto National Museum was established to collect and exhibit to the public tangible cultural properties as stipulated by the Law for the Protection of Cultural Properties		www.kyohaku.go.jp/eng/index.html	3636
Kyoto Samurai and Ninja Museum	Small museum with Edo-period armor (sword displays and family-friendly instruction in warrior skills)		https://mai-ko.com/samurai/	2091
Toji	Historic Buddhist temple with a 5-story wooden pagoda and sculptures of deities from the 8th century		https://toji.or.jp/	4801
Maruyama Park	Popular green space with an outdoor music hall and bronze statues and seasonal cherry blossoms		https://kyoto-maruyama-park.jp/	3005
Sannenzaka Ninenzaka district of Higashiyama	Its traditional architectures and beautiful stone paved road are natured in centuries of history that Ninen-zaka district eared high cultural value in the world		https://2nenzaka.ne.jp/en/top/	3522

	Name	Category	Rating	Review	Price US	Station	Distance (m)
0	Kichisen	Japanese	4.19	79	189.9962	Demachiyanagi	1948
1	nihonryourisakuragawa	Japanese	3.89	61	189.9962	Kyoto Shiyakusho Mae	1692
2	Tankumakitamise	Japanese	3.59	74	189.9962	Kawaramachi	2262
3	Shimogamosaryou	Japanese	3.61	72	132.9962	Demachiyanagi	1989
4	Hanasaki	Japanese	3.58	30	94.9962	Karasuma	2103
5	Orudohonkonresutorankyouto	Chinese	3.88	148	94.9962	Shijo	2178
6	kyoutohyouto	Japanese	3.64	46	68.3962	Karasuma	1902
7	ORTO	Chinese	4.06	53	68.3962	Karasuma Oike	1632
8	kyouryourikaji	Japanese	3.56	67	68.3962	Marutamachi	655
9	Norumandhi	French	3.55	38	53.1962	Kyoto Shiyakusho Mae	1760
10	Ranka	French	3.58	48	53.1962	Kawaramachi	2273
11	Ryuunohige	French	3.7	70	41.7962	Kyoto Shiyakusho Mae	1765
12	Yakinikudainingukinoe	Korean	3.58	39	41.7962	Kyoto Shiyakusho Mae	1317