Gastronomy Tourism Application

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1. Introduction: Business Problem

What is Gastronomy Tourism??

Food is now a main motivation for travelers choosing their destinations. Travelers are spending more time and money on unique food and beverage experiences. We have seen a global increase in food tour companies, food and beverage focused events and food and beverage experience focused marketing efforts.

But can we use machine learning to help improve the gastronomy tourism enthusiasts experience? I am a burger enthusiast, and i am interested in visiting some nice burger specific venues and also have a nice trip in some of Europe's capitals. Can we come up with a data science approach that can help me answer my question: ***in witch cities can i find the best burger joints?*** A nice traveling location in my case should have lots of cheap and high rated burger venues and also should be as close as possible to my hometown Bucharest.

By developing a data science framework to answer my question, maybe we can further help other gastronomy tourists with different interests (let's say pizza lovers) find their next vacation location.

2. Data acquisition and cleaning

First I will need the latitude and longitude coordinates of Europe's capital cities. I will scrap the table from 'http://techslides.com/list-of-countries-and-capitals' website for this info:

Country Name	Capital Name	Capital Latitude	Capital Longitude	Country Code	Continent Name
Afghanistan	Kabul	34.51666667	69.183333	AF	Asia
Aland Islands	Mariehamn	60.116667	19.9	AX	Europe
Albania	Tirana	41.31666667	19.816667	AL	Europe
Algeria	Algiers	36.75	3.05	DZ	Africa
American Samoa	Pago Pago	-14.26666667	-170.7	AS	Australia
Andorra	Andorra la Vella	42.5	1.516667	AD	Europe
Angola	Luanda	-8.833333333	13.216667	AO	Africa
Anguilla	The Valley	18.21666667	-63.05	AI	North America
Antarctica	N/A	0	0	AQ	Antarctica
Antigua and Barbuda	Saint John's	17.11666667	-61.85	AG	North America

Second I will use Foresquare app to get the venues that serve burgers that are within a 1000 m radius around the capital citiies centers. After this step I identify approximately 300 burger venues.

Once I find the venues of intrest I itereate through each one and get other relevant information such as **likes count, photos count , price cateqory, rating etc. using the forsquae app.**

3. Methodological approach:

- Phase1: I will scrap 'http://techslides.com/list-of-countries-and-capitals' to get the latitude and longitude coordinates for all Europe's capital cities

- Phase2: Next, I will get the venues near the capital city centers of Europe

- Phase3: Extract other relevent info (likes count, photos count , price cateqory, rating etc.) using the forsquae app

- Phase4: I will prepare the data for the clustering phase

- Phase5: Clustering the citties using the venu info we extracte from foresquare

- Phase 6: Map vizualization usnig Folium

4. Data Preprocessing:

Next I will prepare the data for the clustering phase. First I will drop Romania my home country from the analysis. Next I encode the price and fill the missing values. The 'Distance_from_Buc' is transformed as one over 'Distance_from_Buc', this is done so that all varaibles have same inerpretability. Next the venue data is agregated at country level by taking the mean of the imput values an the values are standardised.

	likes.count	photos.count	price_cat	rating	Distance_from_Buc_tr
location.cc					
AL	0.000000	1.0	3.000000	0.000000	0.001619
AM	1.000000	1.0	3.000000	0.000000	0.000632
AT	109.666667	90.0	1.666667	6.833333	0.001168
BE	4.600000	3.2	3.000000	1.140000	0.000565
BG	211.000000	222.5	2.000000	3.625000	0.003374

5. Clustering:

Next, I will run K-means clustering algorithm on the following variables: 'likes.count', 'photos.count', 'price_cat', 'rating', 'Distance_from_Buc_tr'. I want to find the cluster of capital citys with the best burger venus (that have most likes, high ratings, high number of photos, cheap prices and also be relatively close to my hometown Bucharest).

The countrys are grouped in 4 cluster and the assignment of each country to it's coresponding cluster si listed below:

location.cc	likes.count	photos.count	price_cat	rating	Distance_from_Buc_tr	labels
AL	0.000000	1.000000	3.000000	0.000000	0.001619	1
AM	1.000000	1.000000	3.000000	0.000000	0.000632	1
AT	109.666667	90.000000	1.666667	6.833333	0.001168	0
BE	4.600000	3.200000	3.000000	1.140000	0.000565	1
BG	211.000000	222.500000	2.000000	3.625000	0.003374	0
BY	17.333333	35.833333	2.666667	3.983333	0.000945	3
CY	73.166667	79.583333	2.416667	3.350000	0.000833	3
CZ	99.000000	50.500000	3.000000	4.400000	0.000928	3
DE	181.000000	63.500000	2.214286	3.985714	0.000773	0
DK	14.600000	11.800000	3.000000	2.640000	0.000636	3
EE	3.000000	5.000000	3.000000	0.000000	0.000598	1
ES	12.000000	13.500000	3.000000	3.975000	0.000405	3
FI	59.000000	42.200000	2.700000	4.600000	0.000571	3
FR	40.823529	34.470588	2.411765	3.988235	0.000534	3
GB	32.222222	23.222222	2.777778	4.255556	0.000479	3

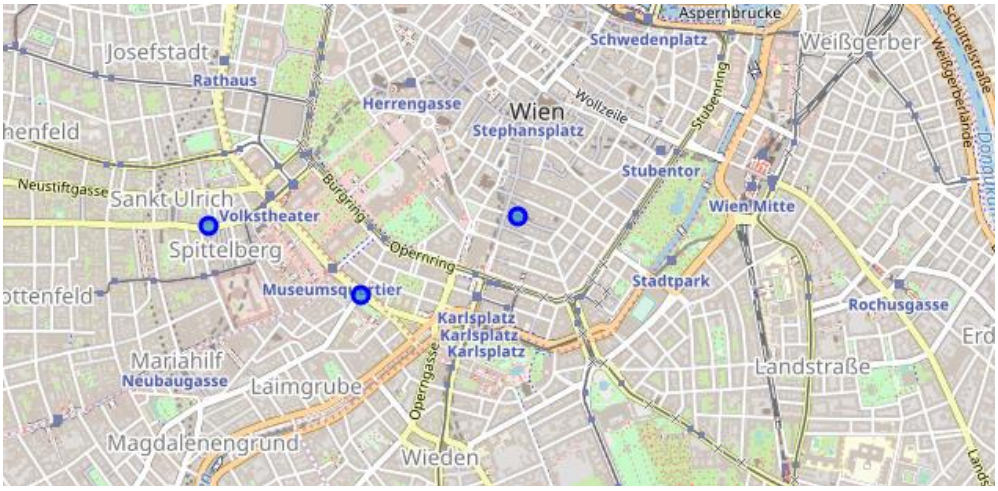
Looking at some agregated results by cluster, it seems that the clusters with the best burger venues are "0" and "2". So, the most atractive cities for a burger frenzy are Kiev ("UA" Ucrain in cluster "2"), Viena ("AT" Austria in cluster "0"), Sofia ("BG" Bulgaria in cluster"0"), Berlin ('DE" Germany in cluster "0") and Ankara ("TR" Turkey in cluster "0"). Well acording to wikipedia Turkey, by land mass, is positioned 95% in Asia and 5% in Europe, so maybe that is the reason that forsquare app lables Turkey as a Europe country.

labels	likes.count	photos.count	price_cat	rating	Distance_from_Buc_tr
0	127.666667	97.625000	1.954613	4.192262	0.001662
1	3.705470	6.002393	2.960342	0.417333	0.001183
2	617.142857	461.142857	2.714286	4.114286	0.001341
3	50.933258	40.407351	2.751777	4.219742	0.000729

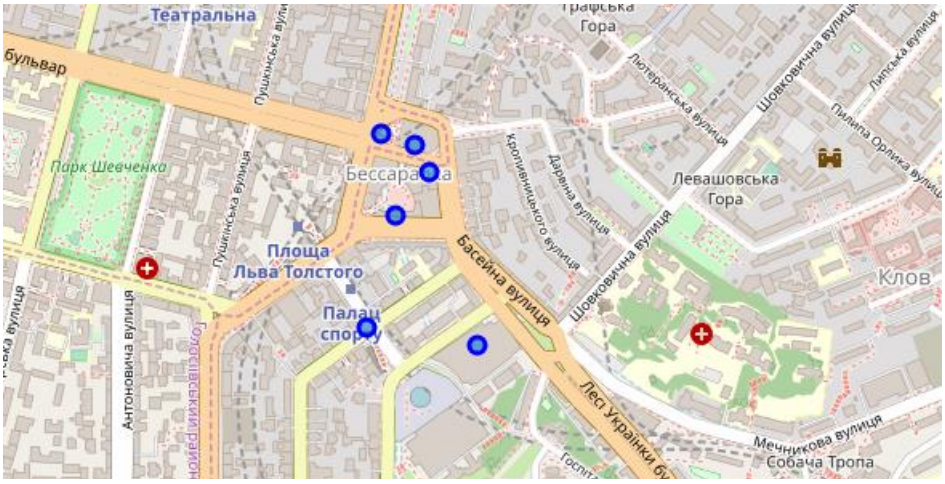
Now let's take a look at the burger venues we found in the most attractive cities.

1) Berlin:

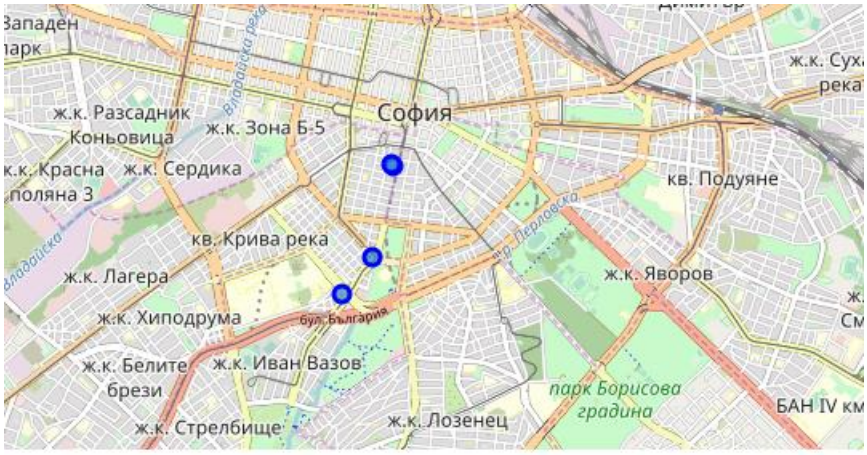
2) Wien:



3) Kiev:



4) Sofia:



5) Ankara:

6. Conclusions:

By developing this data science framework to answer my question (***in witch cities can i find the best burger joints?***) , I wish we can further help other gastronomy tourists with different interests (let's say pizza lovers) find their next vacation location.

As my question goes…the answer to is clear. I found 44 venues in five cities from Europe that have interesting burgers and are now on my vacation list: Berlin, Wien, Kiev, Sofia and Ankara.