

How Universities and Colleges Have Affected the Number of Restaurants in Surrounding Areas

Introduction/Business Problem

I will use the Foursquare API to examine whether having a large university in a my state, Tennessee, impacts the restaurant industry in the area where the college is located. In order to do this, I will use the Foursquare API and Folium to display the number of restaurants in all of Tennessee. Then, I will look specifically for restaurants clustered around a specific area.

Note that I will focus solely on four-year university locations, excluding smaller colleges and community colleges.

I will try to filter out areas that are inherently tourist attractions (such as Nashville) and focus on smaller areas that tourists would not normally visit, such as Cookeville and Knoxville. I will also research other colleges around Tennessee, and I will use Folium to display their locations on a separate map. Finally, I will superimpose one map on top of another to see if there are any trends.

This project can be useful to restaurant owners seeking to open a restaurant in Tennessee or elsewhere, as the results I receive could be generalizable to other areas. In addition, this information could be useful to college students in certain fields, such as culinary students who may be seeking internships in restaurants around their college.

Finally, the information I hope to glean from this project may also useful to parents of prospective college students, as they can see restaurants around the area of a college and use that information to determine the approximate nutritional value of the foods served by restaurants around the area to their children. Note that the term “restaurants,” as used in the context of this project, includes fast food chains.

This information could also be relevant for college students with food allergies or other factors that limit what kind of food they can eat.

Data

I will use data from the Foursquare API, as well has data from a separate CSV file detailing all the colleges in Tennessee, and their respective addresses. I will then use the Geopy module in Python to convert these addresses to coordinates.

The data from the Foursquare API will consist of restaurants around each country in Tennessee. I will visualize this using Folium and a high zoom level centered around the middle of Tennessee.

In order to find restaurants in Tennessee, I will find another CSV of all counties in Tennessee and will make a call to the Foursquare API using the coordinates of each county and specifying a 150 mile radius, which should be enough to span each county in Tennessee.

Methodology

First, I downloaded two CSV's:

Dataset #1: All four-year colleges in Tennessee, based on a survey conducted by the Database of Accredited Postsecondary Institutions and Programs.

Dataset #2: All counties in Tennessee, based on a survey from the University of Tennessee.

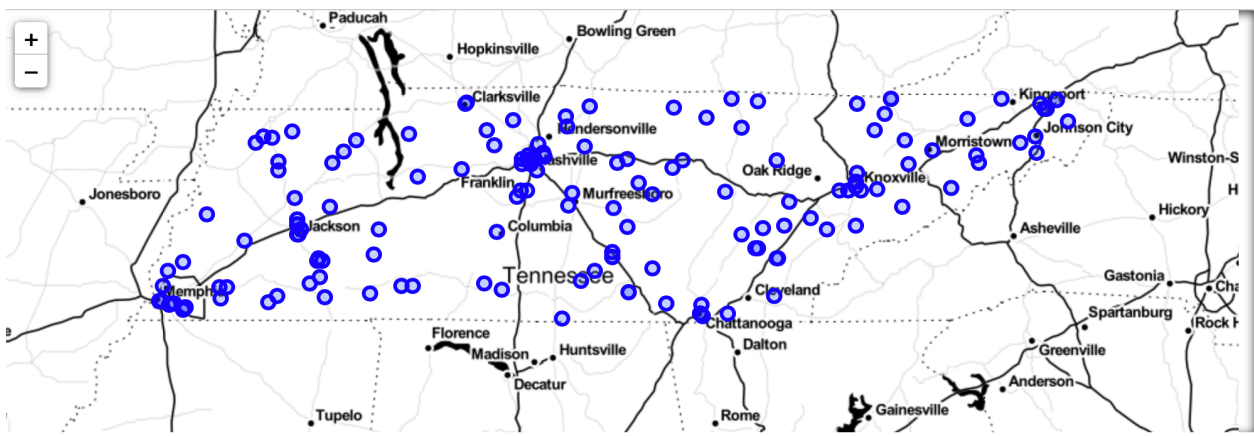
Then, I deleted universities with the word "Campus" from Dataset #1, since the word often indicated a branch of a college whose main head was located in another state. I also deleted the word "Career" and "Community" colleges, since their words indicated 2-year community colleges and vocational schools, which were not in the scope of my project.

Because it was difficult to find only four year colleges from Dataset #1, I filtered out the list to include only elements containing the word "University." Although this was an imperfect solution, as it included some theological seminaries and other non-traditional four-year universities, it included all the main four-year universities and excluded vocational schools.

I went to another website, hosted by Tennessee Reconnect, (<https://tnreconnect.gov/Choose-a-Degree-College-Path/TNReconnect-Colleges-and-Universities>) that showed a short list of four year universities, and verified that all the major four-year universities were on my list.

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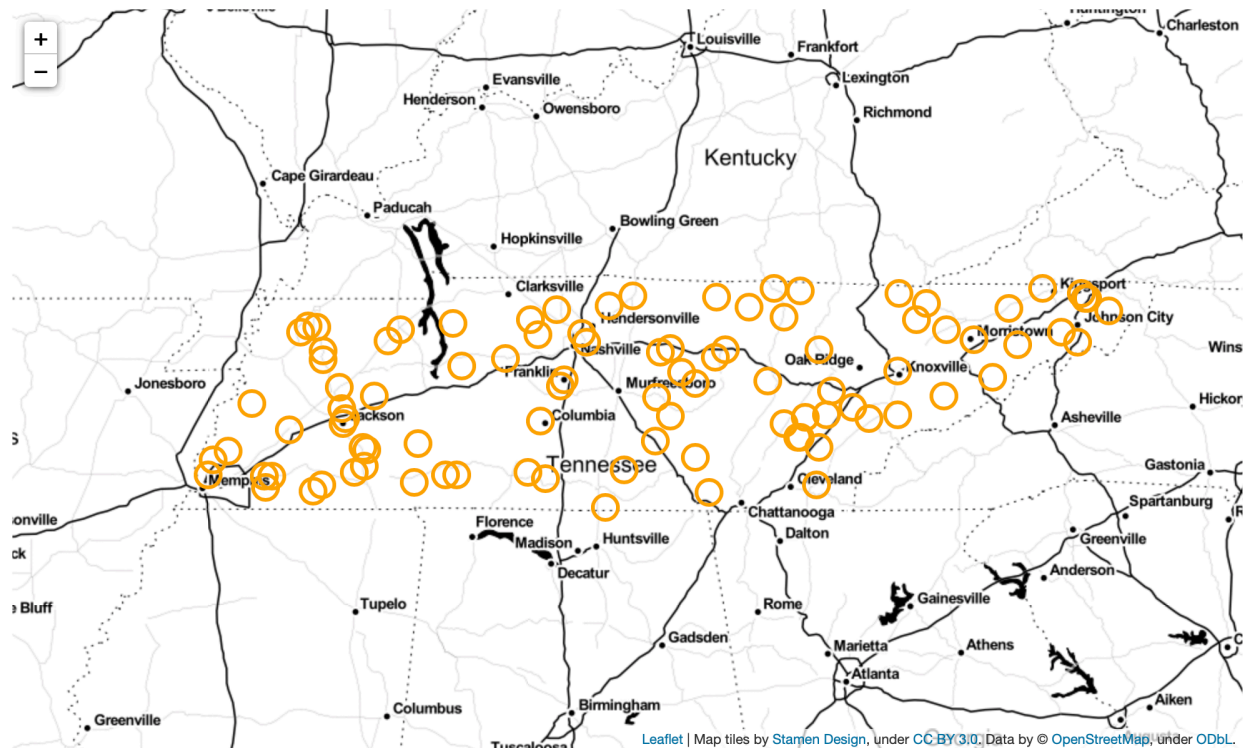
Afterwards, I created a map of all the colleges in Tennessee, as shown in the snapshot on the next page. The map can also zoom in and out.



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For the second part of my project, creating a map of all the restaurants by country, I used the second dataset I created of all the counties in Tennessee. For clarity, I will call this dataset “Dataset #2”. I used this dataset in conjunction with the Foursquare API.

A screenshot of the map I made with orange markers on each county in Tennessee is shown below:

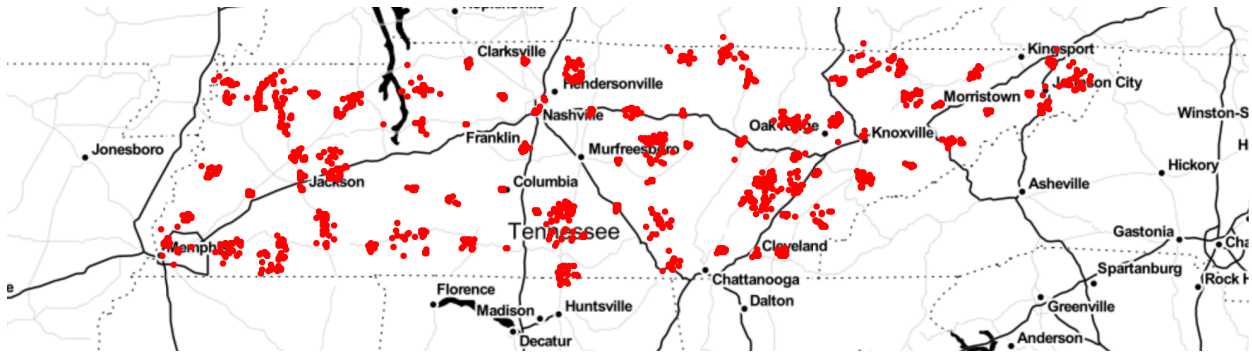


The orange markers have a significantly larger radius than the college markers, in order to differentiate between the two categories: colleges in Tennessee and counties in Tennessee.

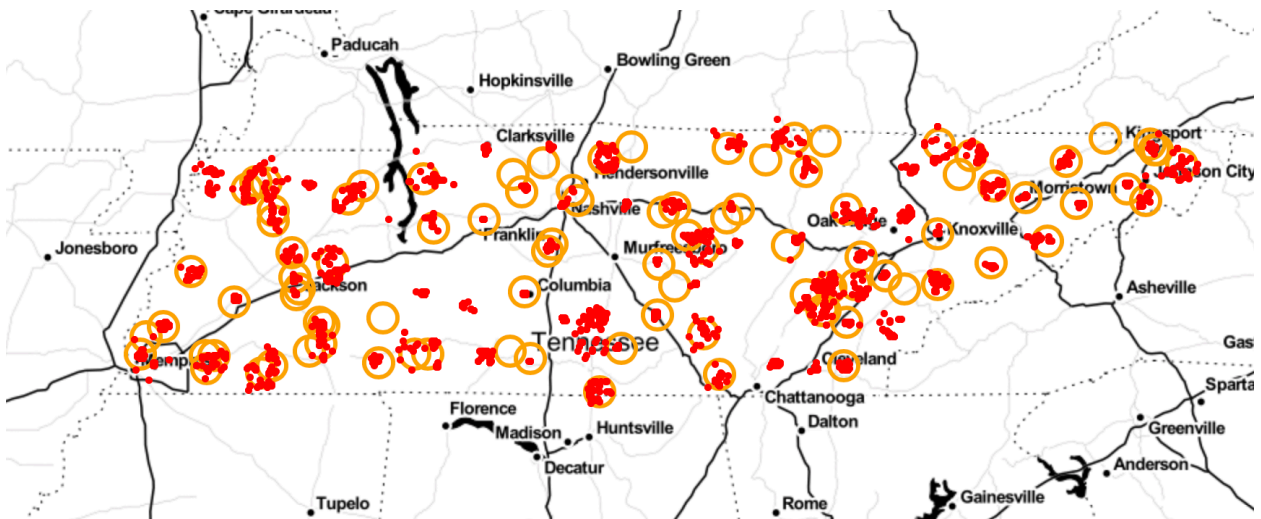
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I spent a large amount of time cleaning the data from the Foursquare API, using dictionaries, lists, and replacing non-numerical characters using the `string.replace()` function.

Finally, after all the coordinates were converted to floats, I plotted that data on a map, using red pinpoints:

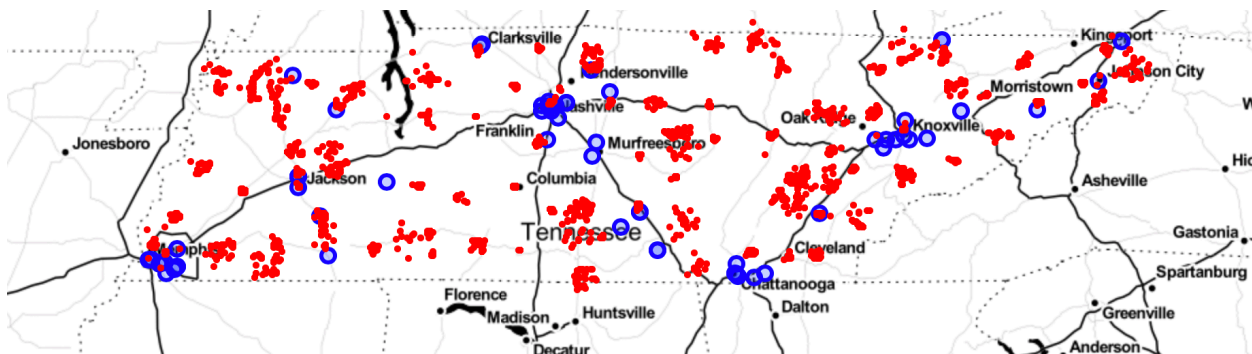


Afterwards, I plotted the red dots, placing them on the map with visualizing counties in Tennessee:



However, after viewing the data, I decided to omit the map with Tennessee counties on it from my project presentation, since it did not provide any insight and only cluttered the map with irrelevant information.

In the end, I superimposed the map visualizing restaurants in Tennessee onto the map visualizing colleges, with the results shown below:



Results

After reviewing the map, I decided there was a moderate correlation between college locations and the number of restaurants around these locations.

On the map, while some colleges, such as a college in Jackson, TN on the far left of the map, had a large number of restaurants surrounding it, other colleges, such as the college in Murfreesboro, had few restaurants surrounding it. However, overall, most colleges had restaurants around it or close to it, even if these restaurants were not directly on the college campus.

It is also important to note that there were large clusters of restaurants that were not near the colleges, such as the clusters between Cleveland, TN, and Oak Ridge, TN.

Discussion

This trend indicates that while colleges in Tennessee generally had restaurants surrounding them, colleges nearby were not the only factor taken into account by restaurant owners when opening a business.

Other factors such as tourism, foot traffic, cost of rent in different areas, and nearby competitors may have taken precedence over college locations.

Conclusion

In conclusion, proximity to a college had only a moderate correlation to the number of restaurant locations in Tennessee. While all colleges had restaurants near them, there were also clusters of restaurants relatively far from any colleges. In order to recommend where to open a restaurant in Tennessee, further research taking into account other factors must be conducted.

References:

1. <http://www.ctas.tennessee.edu/csv-counties-with-cities>
2. <https://ope.ed.gov/dapip/#/home>