Applied Data Science Capstone

Which Boston College/University to start my career as a Data Scientist?

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Introduction

With the new skills I have developed as a data scientist, I want to apply to for a new role in an educational community to begin my career in data science. I picture myself working for a college/university. and I really want to work in my hometown of Boston. My problem is which college or university in the Greater Boston do I want to work for? To assist in my selection, I am going to leverage the power of public datasets and location data to select a school which I think will best fit my new career as a data scientist. With over 50 colleges/universities in the city of Boston, the criteria I am going to use to select a school to apply to work for are

-School located in the Greater Boston Area

-School must have over 5000 students. As a data scientist, I am going to want to intake as much data as possible and believe that 5000 is a solid minimum to retrieve valuable and diverse data.

-School must have access to public transportation in the immediate radius (500M)

-Sports Complexes/Arenas must be supported on the campus. Sports is one of the industries with high demands for data scientists and this is the area I would like to start working.

The target audience for this project would be for any prospective student or employee interested in applying to and learning more about the population size and surrounding neighborhood for schools located in Boston with over 5000 students.

Data Acquisition and Cleaning

For this project I will be leveraging public datasets from Analyze Boston (https://data.boston.gov/) to retrieve the names, coordinates and number of students enrolled in all college/universities. There are over 159 datasets available and I will be utilizing the College and Universities CSV.

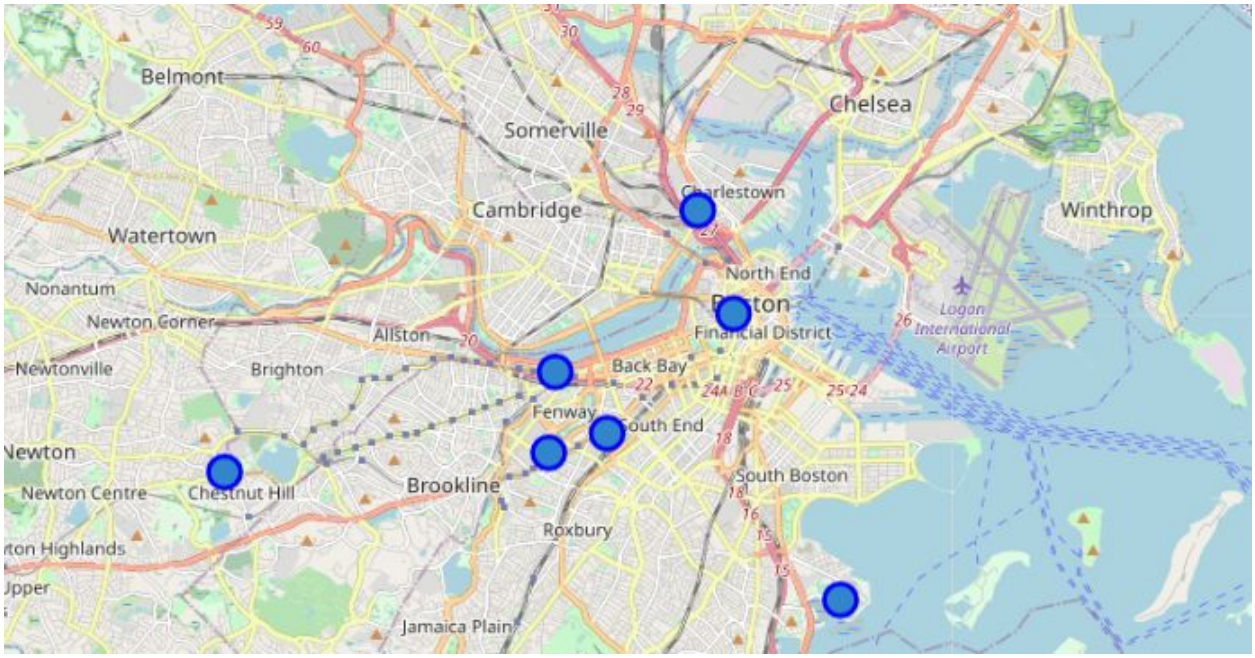
This dataset includes 60 College/Universities in the Boston City Limits and has over 30 columns including data points such as the school name, address, school Id, location coordinates, number of students (years 2012 and 2013), website and even the year the college was built. To better visualize the list I created a pandas dataframe from the CSV and only kept the School Name, Latitude, Longitude and Number of Students in 2013 as that was the most current year available.The location coordinates will be used to further research the surrounding radius of the school using the Foursquare API.

Methodology

The first step in making the decision on which school in Boston to work for was to 53manipulate the pandas dataframe created from the Boston Colleges and Universities CSV to only show schools that have a student body over 5000. This brought the number of schools down from 60 to 7, an 88% decrease of schools listed. With the shorter list it will be much easier to compare the neighborhoods around each school.

	Name	Latitude	Longitude	NumStudents13
0	Boston University	42.349560	-71.099709	32411
1	University of Massachusetts-Boston	42.313809	-71.039202	16277
2	Boston College	42.333833	-71.169719	14309
3	Bunker Hill Community College	42.375117	-71.069572	14023
4	Suffolk University	42.358905	-71.061948	8675
5	Northeastern University	42.340048	-71.088892	8479
6	MCPHS University	42.336880	-71.101120	6548

Next, using the coordinates I visualized the locations of all the schools by marking them on a map of Boston.



To learn more about each school's surrounding neighborhood I needed to leverage the Foursquare API and location coordinates. I created a function using the latitude, longitude coordinates for each of the seven remaining schools to retrieve the top 10 most frequent visited venues in a 500 meter radius from the Foursquare API. This would give me good insight of what schools have surrounding neighborhoods to meet my criteria to want to live and work there. This required one-hot encoding to clean the JSON that was received from the Foursquare API as well as an additional function to add the venues and schools into a pandas dataframe. As these were frequently visited venues near schools I am interested in applying to so I listed them as "Cool Close Venues".

Results

	School	1st Cool Close Venue	2nd Cool Close Venue	3rd Cool Close Venue	4th Cool Close Venue	5th Cool Close Venue	6th Cool Close Venue	7th Cool Close Venue	8th Cool Close Venue	9th Cool Close Venue	10th Cool Close Venue
0	Boston College	College Theater	Café	Convenience Store	Bus Station	Hockey Arena	Bus Stop	Baseball Field	Fast Food Restaurant	Falafel Restaurant	Donut Shop
1	Boston University	American Restaurant	Lounge	Sports Bar	Coffee Shop	Hotel	Sushi Restaurant	Donut Shop	Gym / Fitness Center	Hot Dog Joint	Pub
2	Bunker Hill Community College	Coffee Shop	Yoga Studio	Shopping Mall	Bank	Convenience Store	Donut Shop	Gastropub	Grocery Store	Light Rail Station	Liquor Store
3	MCPHS University	Gym	Coffee Shop	Sandwich Place	Sushi Restaurant	American Restaurant	Bus Station	Italian Restaurant	Gastropub	Falafel Restaurant	Pizza Place
4	Northeastern University	Sandwich Place	Café	Middle Eastern Restaurant	Concert Hall	Theater	Pizza Place	Arts & Crafts Store	Grocery Store	Donut Shop	Ethiopian Restaurant
5	Suffolk University	Coffee Shop	Historic Site	New American Restaurant	Seafood Restaurant	Restaurant	Mediterranean Restaurant	Hotel	Falafel Restaurant	Sandwich Place	Salad Place
6	University of Massachusetts-Boston	Museum	Donut Shop	Fast Food Restaurant	Coffee Shop	Yoga Studio	Food Truck	Concert Hall	Convenience Store	Cosmetics Shop	Deli / Bodega

Only one college has more than 1 venue that meets the listed criteria of having public transit as well as popular sports complexes on campus, Boston College. Two schools have access to public transport: Bunker Hill Community College(light rail station) and MCPHS(Bus Station). The other 4 schools, do not have any top 10 frequently visited venues that meet the criteria.

Discussion

As the only college to have more than 1 venue that meets the listed criteria for selection, Boston College will be my choice school to start as a Data Scientist. With frequently visited sports complexes (hockey arena/baseball field) there should be many opportunities to leverage data in athletics as well as become a fan. It was also interesting to see that there are over 50 schools in Boston with less than 5000 students which may be useful in the future where very small sample sizes are needed.

Conclusion

In this study, I analyzed the surrounding neighborhoods of seven colleges located in Boston, MA. I used the location coordinates to learn what venues are frequently visited in

effort to select an area to want to live and work. This type of analysis could be done in any major city or town to make a location based decision.