A recommendation system for food stalls aimed at students

Introduction:

Mumbai, India is an extremely densely populated city (one of the most dense), with more than 18 million residents.

Obviously it is tough to start a business here due to high real estate costs. So, an entrepreneur aiming at a student centric market (13 - 20 year old demographic) should know the best places to set up shop.

A large population of Mumbai lies in this student demographic (more than 50 schools), and eating snack foods out is more popular and convenient than ever, hence we will find the best places in Mumbai to set up a food shop/ restaurant

Target audience:
Entrepreneurs and small-scale businessmen/women interested in the food/ snacks industry, aiming at the student demographic

Data:

1. We need a list of the most populated schools in Mumbai. Their latitude and longitude will be calculated using geopy Nominatim.
   This data can be found on Wikipedia, as well as the school websites.
   For instance: https://en.wikipedia.org/wiki/List_of_educational_institutions_in_Mumbai
2. Then we can use the FourSquare API to find the number of eateries in a 1km radius around each school. The API will provide us with Postal Code, Neighborhood, Venue, Venue Summary and Venue Category.
3. We can also use the FourSquare API to find all food related categories that we will filter.

4. Processing the Retrieved data and creating a structured DataFrame for all the venues, grouped by schools.
5. Selecting relevant venues (food related only).
6. The schools with least number of eateries around them would be the best places to start a food stall/ restaurant. (supply and demand).
7. Clustering the eateries to find the colleges with least competition around them.

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Methodology:

1. Collected a list of populated schools and college within Mumbai.
2. Used the Nominatim library to find their latitudes and longitudes.
3. Used the FourSquare venues API to find the food related categories to be looked at.
4. Devised a function to find categories of a given venue from our data
5. Used the FourSquare API to find the venues within a 1500m radius of each institute, and plotted these venues accordingly, to a unique colour scheme.
6. Analysed the number of eateries near each institute.
7. Clustered the institutes (due to overlap of eateries around them).
8. Clustered the eateries to find the locations with least number of eateries around it.
9. Found the sizes of each cluster.
10. Found the smallest and largest clusters. (smallest would be best for a new eatery, due to less competition, and largest clusters would be good locations to advertise a new eatery).

Results:

Tolani College has very few eateries around it.
It is a well reputed college in Mumbai and has a large student population. A good eatery aimed at students, or even at the general public would do well here due to sheer lack of competition in the vicinity.

2 clusters were found with approximately *200* eateries near them.

These localities would be great for advertising an upcoming fast food shop or restaurant.

Recommendations and Conclusion:

Through this analysis, I found that all popular institutes in Mumbai, India have a few eateries around them, but there is still scope for expansion into these territories.

Any decently priced eatery opened near Tolani college would be profitable due to sheer lack of competition and high population of clients.