Students Need Their Coffee: Post Pandemic

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I. INTRODUCTION

There's one thing most students can't go without, and that's their local coffee shops. Whether it's the productivity boost from a cup of coffee or the shop itself as the socializing hub, it's hard to deny the importance these businesses have on the micro-economies of urban (student dense) populations. With new coffee shops appearing yearly it's an exciting market to penetrate even with higher competition. A new business owner would benefit from being strategic in where they open up their shop. Naively, the business owner might assume that opening up closer to any highly populated university district would benefit their business the most. This might not be the case when larger chained coffee shops, such as, Starbacks and Second Cup have larger shares in student populated areas. On top of the saturation of chained coffee shops, any modern business owner has to take into account the affects the pandemic has had on the market within their proposed areas of interest. Within the same area, franchised shops have a higher tendency of sustaining themselves during covid-19 shutdown orders, whereas smaller shops are more than likely to fail.

In this report, I attempt to survey the Greater Toronto Area (GTA) coffee shop market for a potential new coffee shop owner, as well as, current coffee shop stakeholders. This survey will consider multiple factors: proximity to a university, franchise coffee shop occurrences, and the site's historical pandemic case information. Alongside specific predetermined features, a k-means clustering algorithm will be employed to locate any hidden features within the dataset.

II. DATA

This survey considers only data within the (GTA) but this is merely an example and the analysis should be general enough to apply to any urban populous. With that in mind, Toronto neighbourhoods are divided by postal code status, or FSA. Postal code data was webscraped from `Wikipedia` and a geographic coordinate is assigned to each postal code using the `Geocoder` API.

(GTA) Is a great example of a highly student populated area, with over ten universities and colleges with populations greater than a few thousand. In this study, only universities with student enrolments greater than 1000 were considered. universities and colleges with narrow fields and predominantly graduate diplomas were ignored. The reason being is that these schools usually cater to an older student population with differing consumer habits to that of an average undergraduate. University data was collected from each of the individual schools official websites. The data include; postal code, university name, and last recorded student population.

The final source of data comes from the Toronto Open Data Catalogue[1] which hosts the city's cumulative covid-19 cases to date. This data was scrapped using their own API. The dataset was later refined to only include cases that are considered "Community Spread" as this is a better indicator on the affects to the local community. The mean of the positive cases by postal code was normalized using,

$$||\text{Cases}||_i = \frac{\text{Cases}_i}{\sum_i \text{Cases}_i} \tag{1}$$

Where i denotes the associated postal code, and the sum is over only postal codes considered in the analysis. A subset of the dataset is shown in Table II, where only postal codes hosting one of the universities is shown and scaled covid cases equals $||\text{Cases}||_i$

[1] https://open.toronto.ca/dataset/covid-19-cases-in-toronto/

PostalCode	Borough	Latitude (°)	Longitude (°)	Universities	Population	Scaled Covid Cases
M5B	Downtown Toronto	43.657162	-79.378937	Ryerson	39471	0.003853
M1C	Scarborough	43.784535	-79.160497	UofT	12980	0.011873
M1G	Scarborough	43.770992	-79.216917	Contennial	35000	0.017357
M2J	North York	43.778517	-79.346556	Seneca	97500	0.020655
M3J	North York	43.767980	-79.487262	York	49905	0.019874
M2M	North York	43.789053	-79.408493	Tysdale	1361	0.011074
M5R	Central Toronto	43.672710	-79.405678	George Brown	32117	0.003836
M5S	Downtown Toronto	43.662696	-79.400049	UofT	93,081	0.002586
M5T	Downtown Toronto	43.653206	-79.400049	OCAD	6072	0.004513
M9W	Etobicoke Northwest	43.706748	-79.594054	Humber	83000	0.025967

TABLE I. Sample of refined neighbourhood survey data for areas hosting a university/college. Population size and scaled covid cases are given for each identifiable postal code