

CHOOSING A SUITABLE LOCATION FOR AN ACAI RESTAURANT

IBM Data Science – Capstone Project

Have you ever tried an açai bowl?



Introduction

Açai is about 1 to 2 centimeters in diameter and a deep purple color. The seed constitutes about 80 percent of the fruit. The taste of açai berries has been described as a blend of chocolate and berries, with a slight metallic aftertaste. Açai berries have been called a superfood, with benefits ranging from improved skin appearance to weight loss.

Thanks to the multiple health benefits that come with making açai part of the diet, it is a fruit whose demand has been growing exponentially, it can be found from ice cream to bowls as you can see in the image. Therefore, the idea was born to give people the opportunity to eat healthily and cheaply.

Research problem

In the project I have focused on a business idea where I am deciding to open an açai restaurant in Toronto, Canada. But I am uncertain about the location that I will choose to open the restaurant. Based on the outcome of using data science methodology and machine learning techniques learned in the capstone data science course, I will be able to choose the best location to open the açai restaurant.

Data

As we need to explore, segment, and cluster the neighborhoods in the city of Toronto, the neighborhood data is the key for this project. I extracted the data from Wikipedia website, I used pandas to transform the data into data frameset that I could use for machine learning methods. Then I used the foursquare API to gather the coordinates and venue data that will be relevant. Also, I could acquire latitude and longitude for each neighborhood by using python library Geopy and run through all neighborhood.

[15]:

| | PostalCode | Borough | Neighborhood | Latitude | Longitude |
|----|------------|-----------------------|---|-----------|------------|
| 2 | M5A | Downtown Toronto | Regent Park, Harbourfront | 43.654260 | -79.360636 |
| 9 | M5B | Downtown Toronto | Garden District, Ryerson | 43.657162 | -79.378937 |
| 15 | M5C | Downtown Toronto | St. James Town | 43.651494 | -79.375418 |
| 19 | M4E | East Toronto | The Beaches | 43.676357 | -79.293031 |
| 20 | M5E | Downtown Toronto | Berczy Park | 43.644771 | -79.373306 |
| 24 | M5G | Downtown Toronto | Central Bay Street | 43.657952 | -79.387383 |
| 25 | M6G | Downtown Toronto | Christie | 43.669542 | -79.422564 |
| 30 | M5H | Downtown Toronto | Richmond, Adelaide, King | 43.650571 | -79.384568 |
| 31 | M6H | West Toronto | Dufferin, Dovercourt Village | 43.669005 | -79.442259 |
| 35 | M4J | East YorkEast Toronto | The Danforth East | 43.685347 | -79.338106 |
| 36 | M5J | Downtown Toronto | Harbourfront East, Union Station, Toronto Islands | 43.640816 | -79.381752 |
| 37 | M6J | West Toronto | Little Portugal, Trinity | 43.647927 | -79.419750 |
| 41 | M4K | East Toronto | The Danforth West, Riverdale | 43.679557 | -79.352188 |

Table 1

Data features:

I leveraged our features using reliable information from FourSquare API that let us explore various venues in each neighborhood. The information is:

1. Neighborhood
2. Neighborhood Latitude
3. Neighborhood Longitude
4. Venue
5. Venue Latitude
6. Venue Longitude

]:

| | Neighborhood | Neighborhood Latitude | Neighborhood Longitude | Venue | Venue Latitude | Venue Longitude | Venue Category |
|--|--|-----------------------|------------------------|-------|----------------|-----------------|----------------|
| | Berczy Park | 48 | 48 | 48 | 48 | 48 | 48 |
| | Brockton, Parkdale Village, Exhibition Place | 23 | 23 | 23 | 23 | 23 | 23 |
| | CN Tower, King and Spadina, Railway Lands, Harbourfront West, Bathurst Quay, South Niagara, Island airport | 17 | 17 | 17 | 17 | 17 | 17 |
| | Central Bay Street | 62 | 62 | 62 | 62 | 62 | 62 |
| | Christie | 14 | 14 | 14 | 14 | 14 | 14 |
| | Church and Wellesley | 69 | 69 | 69 | 69 | 69 | 69 |
| | Commerce Court, Victoria Hotel | 100 | 100 | 100 | 100 | 100 | 100 |
| | Davisville | 26 | 26 | 26 | 26 | 26 | 26 |
| | Davisville North | 10 | 10 | 10 | 10 | 10 | 10 |
| | Dufferin, Dovercourt Village | 13 | 13 | 13 | 13 | 13 | 13 |

Table 2.

I clustered these Neighborhood into similarities and found our which region and place is the best for Acai Restaurant.

Result:

From K-Means Clustering technique, we segmented neighborhood into 5 cluster. These clusters were based on similarities of top venues. This cluster were used to find the best place for Acai Restaurant according to the most common venue of neighborhoods.

1:

| | Borough | Cluster Labels | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue | 6th Most Common Venue | 7th Most Common Venue |
|----|------------------|----------------|-----------------------|-----------------------|-------------------------------|---------------------------|-------------------------------|-----------------------------|-----------------------|
| 2 | Downtown Toronto | 0 | Coffee Shop | Park | Café | Pub | Bakery | Performing Arts Venue | Restaurant |
| 9 | Downtown Toronto | 0 | Coffee Shop | Sandwich Place | Clothing Store | Café | Bank | Pizza Place | Japanese Restaurant |
| 15 | Downtown Toronto | 0 | Coffee Shop | Café | Cocktail Bar | Italian Restaurant | Beer Bar | Clothing Store | Restaurant |
| 19 | East Toronto | 0 | Asian Restaurant | Health Food Store | Pub | Wine Shop | Eastern European Restaurant | Donut Shop | Doner Restaurant |
| 20 | Downtown Toronto | 0 | Coffee Shop | Cocktail Bar | Sandwich Place | Bakery | Vegetarian / Vegan Restaurant | Seafood Restaurant | Beer Bar |
| 24 | Downtown Toronto | 0 | Coffee Shop | Sandwich Place | Sushi Restaurant | Café | Italian Restaurant | Japanese Restaurant | Salad Place |
| 25 | Downtown Toronto | 0 | Grocery Store | Café | Park | Baby Store | Coffee Shop | Restaurant | Nightclub |
| 30 | Downtown Toronto | 0 | Coffee Shop | Café | Sandwich Place | Clothing Store | Gym | Restaurant | Sushi Restaurant |
| 31 | West Toronto | 0 | Wine Shop | Supermarket | Liquor Store | Middle Eastern Restaurant | Music Venue | Pharmacy | Pool |
| 36 | Downtown Toronto | 0 | Coffee Shop | Café | Hotel | Aquarium | Restaurant | Scenic Lookout | Pizza Place |
| 37 | West Toronto | 0 | Bar | Vietnamese Restaurant | Vegetarian / Vegan Restaurant | New American Restaurant | Coffee Shop | Asian Restaurant | Café |
| 41 | East Toronto | 0 | Greek Restaurant | Coffee Shop | Italian Restaurant | Sushi Restaurant | Ice Cream Shop | Yoga Studio | Lounge |
| 42 | Downtown Toronto | 0 | Coffee Shop | Café | Hotel | Sandwich Place | Asian Restaurant | Deli / Bodega | Restaurant |
| 43 | West Toronto | 0 | Café | Nightclub | Breakfast Spot | Coffee Shop | Sandwich Place | Gym | Intersection |
| 47 | East Toronto | 0 | Park | Fast Food Restaurant | Board Shop | Brewery | Pub | Steakhouse | Burrito Place |
| 48 | Downtown Toronto | 0 | Coffee Shop | Sandwich Place | Café | Hotel | Restaurant | Japanese Restaurant | Gym |
| 54 | East Toronto | 0 | Coffee Shop | Café | Gastropub | Bakery | American Restaurant | Fish Market | Ice Cream Shop |
| 62 | Central Toronto | 0 | Home Service | Music Venue | Garden | Wine Shop | Dance Studio | Eastern European Restaurant | Donut Shop |
| 67 | Central Toronto | 0 | Gym / Fitness Center | Hotel | Sandwich Place | Breakfast Spot | Department Store | Food & Drink Shop | Dance Studio |

Table 3.

Conclusion:

As we can see, the first cluster offers a wide variety of restaurants and venues, but with a predominance of walk-in places, healthy food, not too processed food and even low-priced restaurants, so it would allow the acai restaurant to gain markets shares of due to similar neighborhoods.

Due to the value offer of the Acai restaurant, healthy, delicious and low-cost food, it would be recommended to choose Central Toronto's neighborhood to place the restaurant. Also, Within the most common locations in Central Toronto, we can observe Gym / Fitness Centre, Breakfast Spot and Sandwich Place, which means that the people who regularly walk through this neighborhood meet the basic characteristics of the average acai restaurant customer.