

TOPIC

Using Machine Learning To Find A Location For Opening A Restaurant In Wayne County, Michigan.

QUESTION 1.

INTRODUCTION AND BACKGROUND OF THE PROBLEM

INTRODUCTION

Background: Location is one of the key factors for success of a restaurant, especially at the beginning. Many restaurants are popular because of their location. When looking for a restaurant location the one of the main factors to consider is the neighborhood. The key questions that need to be asked about the neighborhood are: Who is doing business in the neighborhood - successful businesses attract other successful businesses-? How many restaurants, similar as yours are in the neighborhood? How busy is the neighborhood? Other information that can be incorporated in selecting a neighborhood is the presence of other businesses that attract people to your restaurants. This includes sports stadium, major medical facility and theaters. For example, moviegoers often stop by to eat in restaurants before or after the show, therefore the presence of such attraction is a plus. The other factor that needs to be considered is the population size. The neighborhood should have enough people to support your restaurant. There should be enough people who live in or pass through the area regularly to keep you busy.

The problem: Having a successful restaurant depends on multiple key factors that goes beyond the quality of the food and the service. Choosing to open a restaurant without considering those key factors could possibly lead to a fail. One of the key factors for a successful is choosing the location.

Target Audience: Entrepreneurs who are coming to US and are planning to open a restaurant in Wayne country in Michigan.

QUESTION 2.

DATA DESCRIPTION

Data: The following data will be used with machine learning (k-mean) in identifying a potential location for a successful restaurant in Michigan.

First : List of all neighborhoods and the population in Wayne Michigan from Wikipedia will be extracted. The data will contain information about different counties and only the data with Wayne county will be filtered. Neighborhoods/cities will be checked for any duplications by grouping the neighborhood. Unnecessary data will be filtered out.

Data from Wikipedia: https://en.wikipedia.org/wiki/List_of_municipalities_in_Michiga

	City	Type	County	Population2010	Population2000
0	Acme	Township	Grand Traverse	4375	4332
1	Ada	Township	Kent	13142	9882
2	Adams	Township	Arenac	563	550
3	Adams	Township	Hillsdale	2493	2498
4	Adams	Township	Houghton	2573	2747

Second: Latitude and longitude of those cities will be collected using Geocoder package.

	City	Latitude	Longitude
0	Allen Park	42.26392	-83.22005
1	Belleville	42.20562	-83.48659
2	Brownstown	42.15029	-83.26627
3	Canton	42.31117	-83.48735
4	Dearborn	42.32207	-83.17629

Third: Venues (e.g Restaurants, theaters) in the neighborhood within a diameter of 1000 m will be extracted using Foursquare API.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Allen Park	42.26392	-83.22005	Glass Onion Griddle	42.257350	-83.211760	Breakfast Spot
1	Allen Park	42.26392	-83.22005	Thai Vylai	42.258285	-83.208069	Thai Restaurant
2	Allen Park	42.26392	-83.22005	Big Ben's Comix Oasis	42.257481	-83.210159	Hobby Shop
3	Allen Park	42.26392	-83.22005	Shish Palace	42.259297	-83.209561	Mediterranean Restaurant

Fourth: K-mean machine learning will be used to cluster the neighborhood and neighborhoods with high number of venues (e.g. restaurants) and more populated will be identified as an optimums location to open a restaurant.

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