PREDICTING THE CHARACTERISTICS OF TRENDING VEGETARIAN RESTAURANTS

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Predicting trending vegetarian restaurants is valuable for restaurant entrepreneurs

Background

- 80% of New York restaurants close within their first five years
- Potential restaurant owners can reduce the likelihood of their failure by using empirical data on successful restaurants in their city

Project Purpose

- To provide potential restaurant entrepreneurs recommendations on where they should open vegetarian restaurants by looking at the relationship between trending vegetarian restaurants and the characteristics of surrounding top vendors

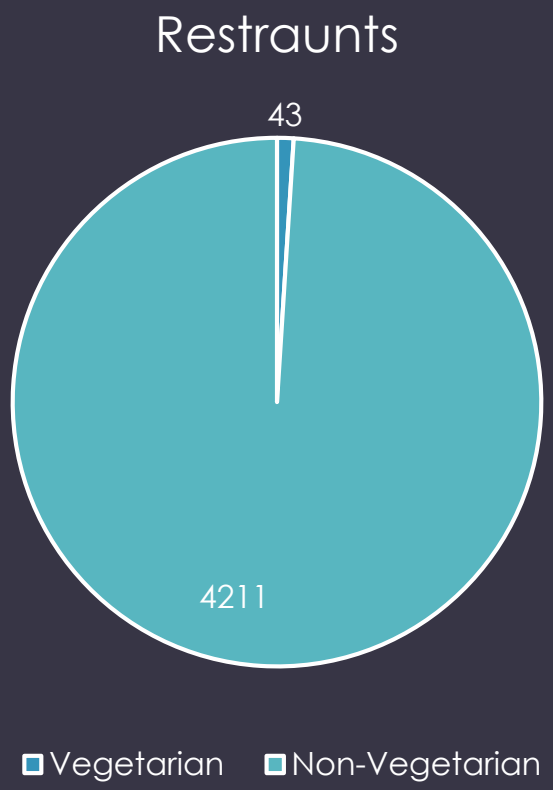
Importance

By examining trends in the locations of successful vegetarian restaurants, restaurant entrepreneurs can better decide where they should locate a vegetarian restaurants in their city

Data Acquisition, Cleaning, and Analysis

- Data
  - New York City Neighborhood Centers
    - Source: New York University's Spatial Data Repository (https://geo.nyu.edu/catalog/nyu_2451_34572)
    - Description: Shape file of 306 points for New York City neighborhood centers in 5 New York City boroughs
  - Top 100 Vendors within 500 meters of New York City Neighborhood Centers
    - Source: Foursquare (https://foursquare.com/)
    - Description: List of 10,298 vendors made up of the top vendors within a 500 meter radius from each neighborhood center
- Analysis
  - Examined number of vegetarian restaurants in each New York City neighborhoods
  - Used summary statistics and Logit regression to determine the relationship between successful vegetarian restaurants and the characteristics of the neighborhoods where these restaurants are located
  - Used summary statistics and OLS regression to determine the relationship between the number of successful vegetarian restaurants and the characteristics of the neighborhoods where these restaurants are located
- Code to acquire, clean, and analyze dataset is available at https://github.com/katewillyard/Coursera-Data-Management-Capstone/blob/master/Vegetarian%20Restraunt%20Reccomendation.ipynb

There are few top vegetarian restaurants



In Comparison to Successful Non-Vegetarian Restaurants, Successful Vegetarian Restaurants are in Neighborhoods with More Venues, More Nightlife, and Fewer Other Nearby Restaurants

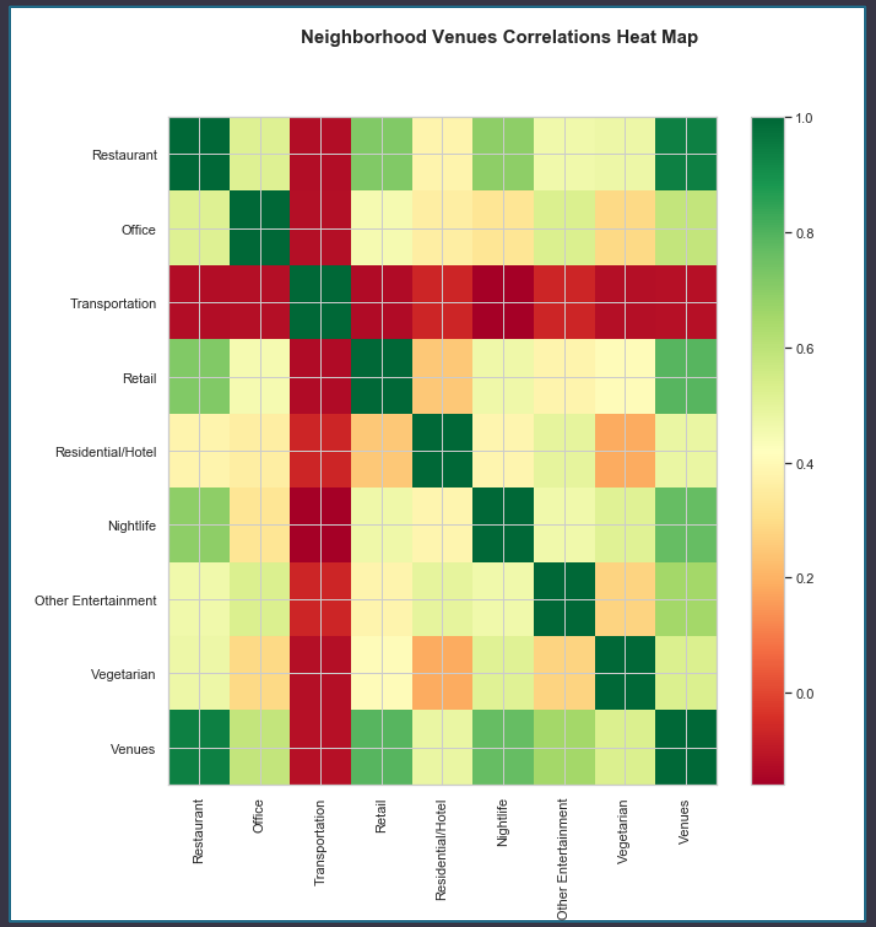
Type	Average Number of Nearby Nightlife Venues	Average Number of Nearby Venues	Average Number of Nearby Other Restaurants
Non-Vegetarian	2.85	61.6	0.80
Vegetarian	5.45	88.16	0.47

Results: Logit

Model:	Logit	Pseudo R-squared:	-0.630
Dependent Variable:	Vegetarian	AIC:	799.7277
Date:	2019-04-07 19:38	BIC:	850.5726
No. Observations:	4254	Log-Likelihood:	-391.86
Df Model:	7	LL-Null:	-240.34
Df Residuals:	4246	LLR p-value:	1.0000
Converged:	1.0000	Scale:	1.0000
No. Iterations:	10.0000		

	Coef.	Std.Err.	z	P>|z|	[0.025	0.975]
Restaurants	-0.2837	0.0305	-9.3115	0.0000	-0.3435	-0.2240
Offices	-0.2348	0.0938	-2.5043	0.0123	-0.4186	-0.0510
Transport	-1.6075	0.2119	-7.5870	0.0000	-2.0228	-1.1922
Retail	-0.1664	0.0347	-4.7910	0.0000	-0.2345	-0.0983
Residential	0.0652	0.1122	0.5813	0.5610	-0.1547	0.2851
Nightlife	0.1791	0.0578	3.1011	0.0019	0.0659	0.2923
Entertainment	-0.2523	0.0584	-4.3174	0.0000	-0.3668	-0.1377
Venues	0.0978	0.0201	4.8565	0.0000	0.0583	0.1373

Neighborhoods with More Successful Vegetarian Restaurants have More Venues, and Fewer Other Restaurants

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                  Results: Ordinary least squares
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Model:              OLS              Adj. R-squared:     0.017
Dependent Variable: Vegetarian       AIC:                -7539.3277
Date:               2019-04-07 19:51 BIC:                -7494.8384
No. Observations:   4254             Log-Likelihood:     3776.7
Df Model:           7                F-statistic:        11.67
Df Residuals:       4247             Prob (F-statistic): 8.90e-15
R-squared:          0.019            Scale:              0.0099338
------------------------------------------------------------------
                 Coef.   Std.Err.     t     P>|t|    [0.025   0.975]
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Restaurants     -0.0009    0.0003  -2.7385  0.0062  -0.0015  -0.0003
Offices          0.0002    0.0009   0.1648  0.8691  -0.0016   0.0019
Transport       -0.0007    0.0012  -0.5417  0.5881  -0.0031   0.0018
Retail          -0.0000    0.0003  -0.0538  0.9571  -0.0007   0.0007
Nightlife        0.0007    0.0008   0.8988  0.3688  -0.0009   0.0023
Entertainment   -0.0009    0.0005  -1.7654  0.0776  -0.0019   0.0001
Venues           0.0006    0.0002   2.4807  0.0132   0.0001   0.0011
------------------------------------------------------------------
Omnibus:              6429.367     Durbin-Watson:         1.989
Prob(Omnibus):        0.000        Jarque-Bera (JB):      1575518.300
Skew:                 9.664        Prob(JB):              0.000
Kurtosis:             95.277       Condition No.:         66
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Recommendations

- Restaurant entrepreneurs should locate vegetarian restaurants in neighborhoods that have a:
  - Large number of venues
  - More nightlife
  - Fewer other restaurants