Best Singaporean Neighborhood for the Foodie

Introduction

- Food and eating is central to the national identity and is an important cultural and social activity
- Singapore well-known for its food, with both delicious local hawker cuisine and world-class international fares
- This project uses location data to determine the neighborhood in Singapore with the best food.
- This information has several useful applications :
  - Tourists who are foodies can find places to stay that will give them easy access to the best food, or find neighborhoods that they can visit for a one-stop food trial.
  - Considering the importance of food nationally, Singaporeans can use the information as an additional metric when they are considering where to move and stay.

Data

- List of neighborhoods: https://en.wikipedia.org/wiki/Planning_Areas_of_Singapore
  - Longitude and latitude collected manually using Google Search
- Foursquare API Venue Search
  - ID
  - Name
  - Latitude
  - Longitude
  - Category
- Foursquare API Venue Details Search
  - Overall rating
  - Number of tips
  - Number of likes

Methodology – Web Scraping and Data Collection

- Scraped web for list of neighborhoods, combine with location data

	Neighborhood	Region	Population	Latitude	Longitude
0	Ang Mo Kio	North-East	163,950	1.3691	103.8454
1	Bedok	East	279,380	1.3236	103.9273
2	Bishan	Central	88,010	1.3526	103.8352
3	Boon Lay	West	30	1.3386	103.7058
4	Bukit Batok	West	153,740	1.3590	103.7637

Methodology – Getting Information on Food Venues

- Used Foursquare API to get food places near each neighborhood
- Cleaned the data to remove non-food related venues

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	ID	Venue	Venue Latitude	Venue Longitude	Category
0	Ang Mo Kio	1.3691	103.8454	4c657dabe2ee9c749ce32d2f	Ang Mo Kio Central Market & Food Centre	1.372037	103.846366	Food Court
1	Ang Mo Kio	1.3691	103.8454	4d85cc1d509137042a3b9e5b	AMK 722 Food House	1.371989	103.847495	Food Court
2	Ang Mo Kio	1.3691	103.8454	4b691f1ff964a520ba992be3	Food Loft	1.372554	103.847913	Food Court
3	Ang Mo Kio	1.3691	103.8454	4bc08969b492d13a345ba460	AMK Food House	1.368245	103.844001	Coffee Shop
4	Ang Mo Kio	1.3691	103.8454	4b149e47f964a52023a523e3	S11 Food House	1.371501	103.847783	Food Court

Methodology – Getting Information on Food Venues

- Used the Foursquare API to get details on the venue

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	ID	Venue	Venue Latitude	Venue Longitude	Category	Rating	Tip Count	Likes
0	Ang Mo Kio	1.3691	103.8454	4c657dabe2ee9c749ce32d2f	Ang Mo Kio Central Market & Food Centre	1.372037	103.846366	Food Court	6.8	162	99
1	Ang Mo Kio	1.3691	103.8454	4d85cc1d509137042a3b9e5b	AMK 722 Food House	1.371989	103.847495	Food Court	5.7	16	11
2	Ang Mo Kio	1.3691	103.8454	4b691f1ff964a520ba992be3	Food Loft	1.372554	103.847913	Food Court	4.9	30	5
3	Ang Mo Kio	1.3691	103.8454	4bc08969b492d13a345ba460	AMK Food House	1.368245	103.844001	Coffee Shop	5.5	14	2
4	Ang Mo Kio	1.3691	103.8454	4b149e47f964a52023a523e3	S11 Food House	1.371501	103.847783	Food Court	5.7	82	56

Methodology – Data Wrangling

- Replace empty values of rating, tip count and likes with mean of other venues in the same category
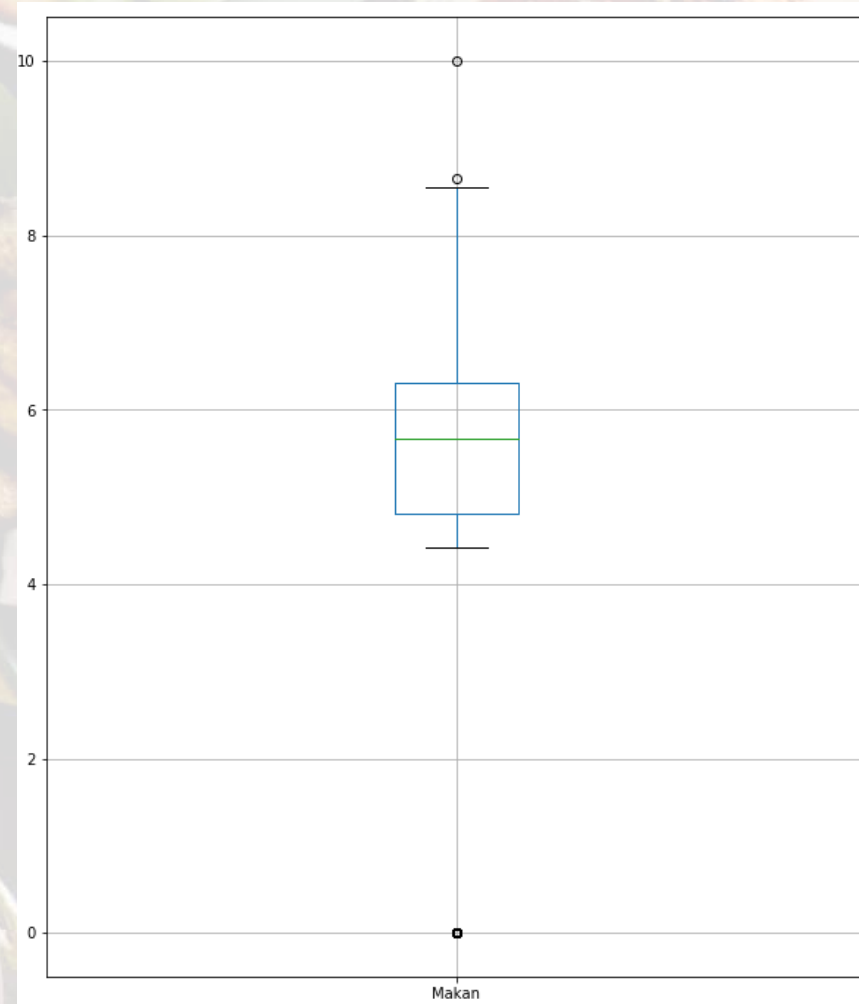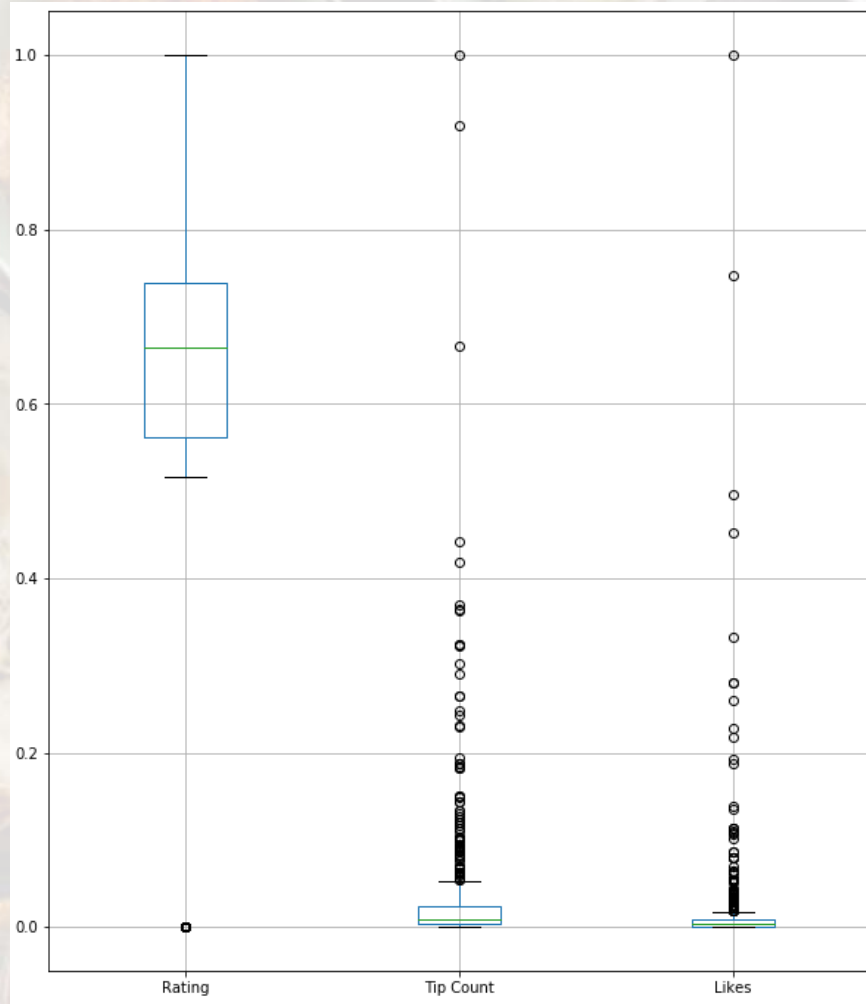
- Normalized values between 0 and 1

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	ID	Venue	Venue Latitude	Venue Longitude	Category	Rating	Tip Count	Likes
0	Ang Mo Kio	1.3691	103.8454	4c657dabe2ee9c749ce32d2f	Ang Mo Kio Central Market & Food Centre	1.372037	103.846366	Food Court	0.764045	0.364865	0.107492
1	Ang Mo Kio	1.3691	103.8454	4d85cc1d509137042a3b9e5b	AMK 722 Food House	1.371989	103.847495	Food Court	0.640449	0.036036	0.011944
2	Ang Mo Kio	1.3691	103.8454	4b691f1ff964a520ba992be3	Food Loft	1.372554	103.847913	Food Court	0.550562	0.067568	0.005429
3	Ang Mo Kio	1.3691	103.8454	4bc08969b492d13a345ba460	AMK Food House	1.368245	103.844001	Coffee Shop	0.617978	0.031532	0.002172
4	Ang Mo Kio	1.3691	103.8454	4b149e47f964a52023a523e3	S11 Food House	1.371501	103.847783	Food Court	0.640449	0.184685	0.060803

Methodology – Scoring Venues and Neighborhood

- Gave each venue a 'Makan' = rating + (tip count * like) * 1/4.
  - Given that most of the tip counts and likes are closer to zero, the formula reduces the extent of the penalty for venues that have no tips or likes.
  - After experimenting with various formulae, the above formula gives a reasonably good outcome with a decent spread in the scores and few outliers.
  - Venues with a high number of tips and likes (i.e. close to normalized value of 1), will get up to a maximum 50% boost on their overall score.
- Normalized the scores to get a 'Makan' score out of 10.
- Calculated the aggregate 'Makan' score for each neighborhood, and determined their ranking

Methodology – Scoring Venues and Neighborhood

Results

- Makan score for individual venues

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	ID	Venue	Venue Latitude	Venue Longitude	Category	Rating	Tip Count	Likes	Makan
0	Ang Mo Kio	1.3691	103.8454	4c657dabe2ee9c749ce32d2f	Ang Mo Kio Central Market & Food Centre	1.372037	103.846366	Food Court	0.764045	0.364865	0.107492	6.606489
1	Ang Mo Kio	1.3691	103.8454	4d85cc1d509137042a3b9e5b	AMK 722 Food House	1.371989	103.847495	Food Court	0.640449	0.036036	0.011944	5.468544
2	Ang Mo Kio	1.3691	103.8454	4b691f1ff964a520ba992be3	Food Loft	1.372554	103.847913	Food Court	0.550562	0.067568	0.005429	4.701023
3	Ang Mo Kio	1.3691	103.8454	4bc08969b492d13a345ba460	AMK Food House	1.368245	103.844001	Coffee Shop	0.617978	0.031532	0.002172	5.275926
4	Ang Mo Kio	1.3691	103.8454	4b149e47f964a52023a523e3	S11 Food House	1.371501	103.847783	Food Court	0.640449	0.184685	0.060803	5.491593

Results

- Top 10 neighborhoods

	Neighborhood	Latitude	Longitude	Makan
0	Singapore River	1.2870	103.8500	233.632583
1	Outram	1.2849	103.8439	230.998949
2	Museum	1.2966	103.8485	219.333125
3	Rochor	1.3051	103.8509	218.745046
4	Orchard	1.3048	103.8318	212.049354
5	Bedok	1.3236	103.9273	198.531635
6	Bukit Merah	1.2819	103.8239	195.687392
7	Ang Mo Kio	1.3691	103.8454	186.343704
8	Toa Payoh	1.3343	103.8563	178.139644
9	Clementi	1.3162	103.7649	174.715102

Results

- Map available at https://github.com/jiantleman/Coursera_Capstone/blob/master/Capstone%20Project%20-%20The%20Battle%20of%20Neighborhoods.ipynb