An Agile Way to Select Places to Visit for Vacation

Data Source

The Data is sourced from Foursquare.

Foursquare

- It is a technology company with a massive dataset of location-data

- The location data is available for use by anyone

- It is used by many companies (such as twitter, Airbnb, Samsung and Uber) whose services are driven by location data

- The dataset is crowd-sourced

  - individuals connect to Foursquare using either the Foursquare App or Website to add venues or update data about venues

Source:
https://foursquare.com
https://foursquare.com/products/places/

Data Source - Data

Foursquare Places - Data

Offers real-time access to a global database of rich venue data and user content used to drive location-based experiences on apps and websites.

The data from Foursquare Places
- represents 100M+ commercial points-of-interest (POI)
- covers 248+ countries and territories
- contains 80+ extended attributes
- is trusted by top enterprises their location-based services
- is updated regularly by the Foursquare Consumer App Superuser Community
- is accessible via Foursquare API (Application Programming Interface) or as a Flat File

Source: https://docs.foursquare.com/docs/places-data-overview
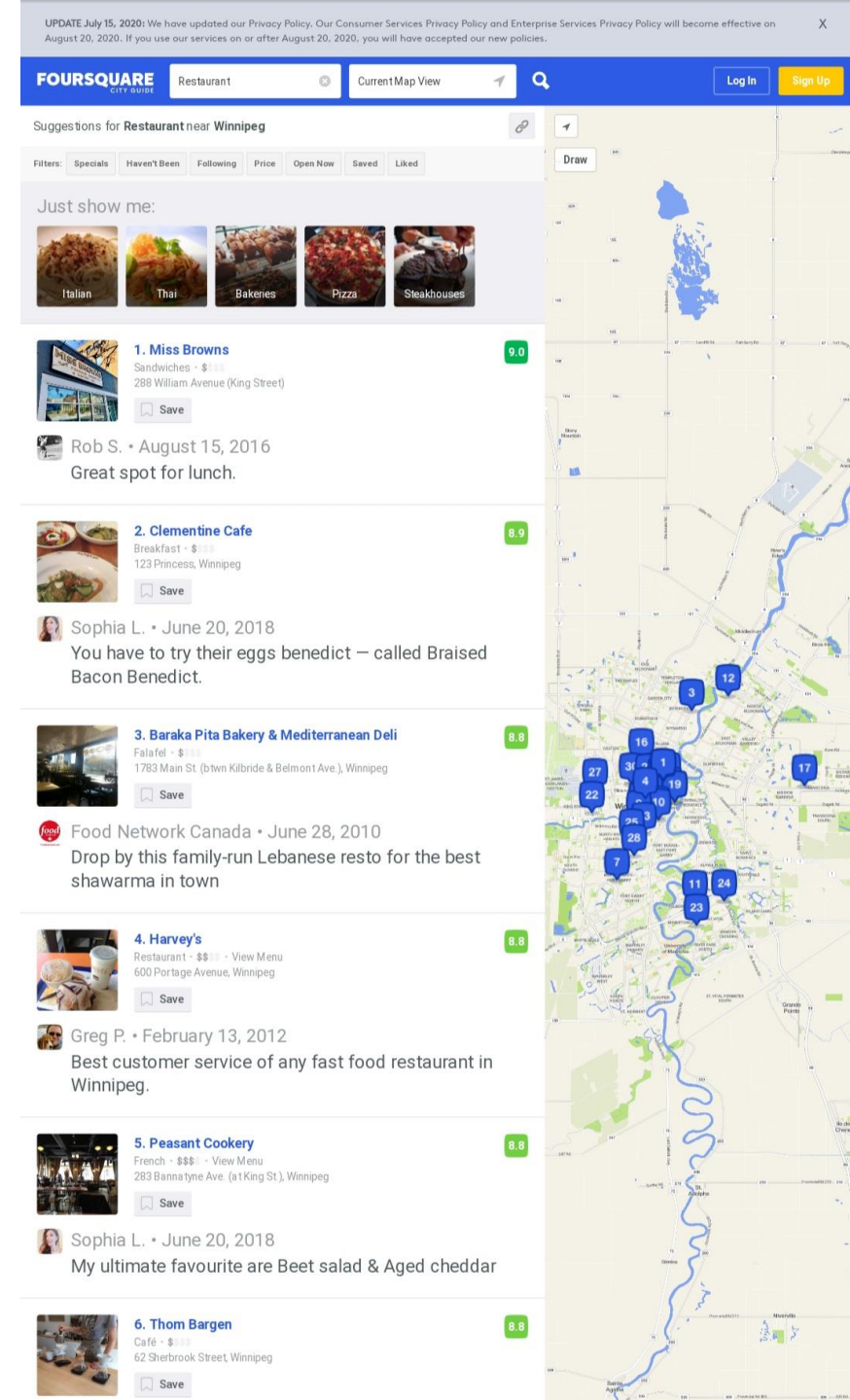
Data Source – Data Features

Foursquare Places – Data Features

The venue data features is available as a flat file in JSON or TSV format.

The features of the venue data provided in real time by Foursquare Places are

- 60M+ commercial points-of-interest (POI)

- 941 Venue Categories

- 1M+ fresh Tips (added within the past six months)

- 18.5M fresh Photos (added within the past six months)

- 7.6M+ Venues with popular hours

- 23K+ Chains, including retailers, autodealerships, etc.

Source: https://developer.foursquare.com/docs/places-database/details/

Data Source – Places (Access & Usage)

Foursquare Places API – Access and Usage

The following control access to and usage of Foursquare API.

- API Endpoint - this is the point where two applications connect

- Rate Limit – this specifies the maximum number of calls allowed within a specific time interval

- Authentication - used to recognize users and allow access

Source: https://developer.foursquare.com/docs/places-api/getting-started/

Data Source – API (Endpoints)

Foursquare API - Endpoints

There are two types of Endpoints

- Regular
  - This include basic venue descriptive attributes such as data, category, and ID

- Premium
  - This includes all basic attributes and other rich data such as ratings, URLs, photos, tips, menus, etc.

Note:
Restrictions on endpoints are applied based on the type of account in use.

Regular Endpoint

Premium Endpoint

Source: https://developer.foursquare.com/docs/places-api/endpoints/

Data Source – Rate Limit

Foursquare Rate Limits

What is Rate Limit?
- Rate Limit regulates the use of API
- It determines if a Regular or Premium API call will be made

Types of Rate Limit
- Daily Call Quota
- Hourly Rate Limit

Note:
- Rate limit acts per top-level endpoint, not per end-point
- the limit that will be placed on the usage of the API will depend on whether hourly rate limit or daily call quota occurs first

Daily Call Quota

Account Tier	Sandbox	Personal	Start-up
Regular API Calls	950	99500	Call for Upgrade
Premium API Calls	50	500	Call for Upgrade

Call Quota
- represents the maximum number of API calls allowed in 24 hours.
- resets daily at midnight UTC
- dependent on the tier of the developer's account

Hourly Rate Limit

Type	Hourly Rate Limit
Userless requests to venues/* endpoints	5000
Userless requests to other endpoint groups	500

Source: https://developer.foursquare.com/docs/places-api/rate-limits/

Data Source - Authentication

Authentication
This refers to the codes that allows users to connect to Foursquare.

There are two types authentications that can be initiated:
- userless auth
- user auth

Userless Auth
- a user's permission is not required
- requires Client ID and Client Secret

User Auth
- user's permission is required
- there are two types
  - iOS/Andriod (which uses native auth)
  - Web (which uses OAuth)

Note:
OAuth is a standard that allows applications and websites have access to resources on other application or website on behalf of users.

Source: https://developer.foursquare.com/docs/places-api/authentication/

Data Source – Places API

Places API / Getting Started

Create a new app
APP NAME
Your App Name
APP OR COMPANY URL
https://www.yourappname.com
☐ I'm not a robot
Next   Cancel

Obtain Your Client ID and Secret

Once you've created your app, make note of your Client ID and Client Secret since you will need these credentials in order to make a request. Please note the key below has been generated for this guide and will not be usable in an application.

ID & SECRET
CLIENT ID
CLIENT SECRET
Reset Client Secret

Foursquare Places API – How to

To use Places API, the developer would

- create a developer's account

- create a Foursquare app and submit the URL for the host

- obtain app credentials – Client ID and Client Secret

- make an API call to get requests of Foursquare's servers

- use OAuth access to make authenticated calls

Note:
- Different account options are available for a developer to choose from.
- The type of account determines the amount of data that can be pulled at any point in time.

Source: https://developer.foursquare.com/docs/places-api/getting-started/

Data Source - Accounts

Foursquare Accounts

There are four account tiers:

- Sandbox (Initial Account Created)

- Personal account (Non-commercial)

- Start-up (Commercial)

- Enterprise (Commercial)

Note:
- Upgrade from Sandbox to Personal needs credit card verification.
- A personal account can be upgraded to a more suitable account as needed.

Source: https://developer.foursquare.com/docs/places-api/getting-started/

Data Source – Venue Search

Foursquare API – Venue Search

This is used to identify venues around a particular location.

The results from a venue request will be based on the endpoints used

The steps involved are used to

- make venue request (with a search or explore endpoint
  https://api.foursquare.com/v2/venues/search
  https://api.foursquare.com/v2/venues/explore

- authenticate the connection as either a userless or user authentication

- specify required parameters. Some parameters and their description are shown in the picture

Venue Search/Explore

Search Parameters

Authentication

Response Fields

Source: https://developer.foursquare.com/docs/api-reference/venues/search/

Data Response – Example

Some the fields supplied in the response are shown in the table and picture.

Field	Description
warning	If applicable, a warning message with suggestion will be provided
id	A unique string identifier for the venue
name	The best know name for the venue
location	An object containing none, some, or all of address (street address), crossStreet, city, state, postalCode, country, lat, lng and distance. Note: Some venue's locations are hidden due to privacy reasons (e.g private residencies)

Source: https://developer.foursquare.com/docs/api-reference/venues/search/#response
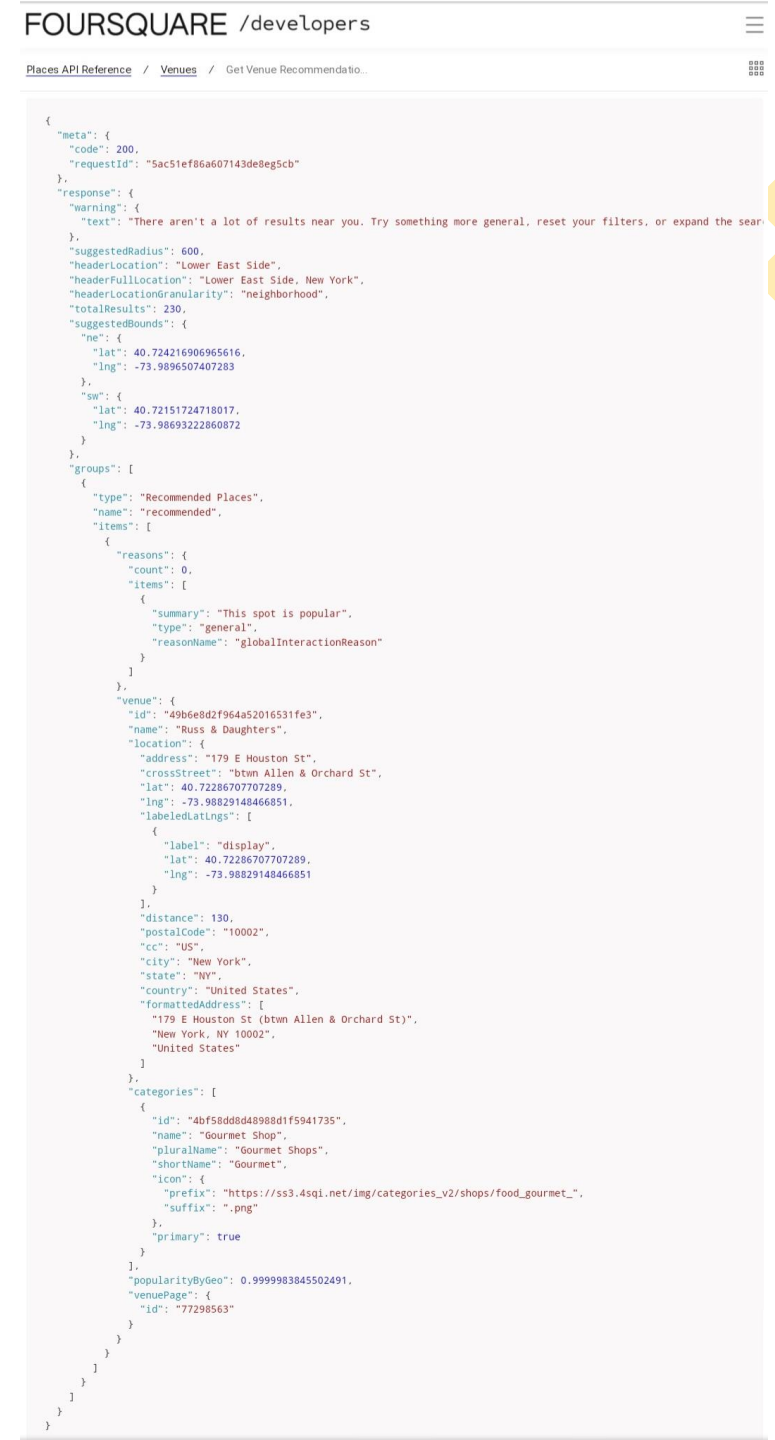
Data Response – Venue Recommendation

Foursquare API – Venue Data Response

Venue recommendation is the venue data that is returned in response to an API venue request.

- It is returned when venue data request has been successfully made

- It contains a list of recommended venues near a specified location will be returned

- For each venue returned, the several response attributes will be returned such as venue name, venue ID, venue category, venue location (address), venue latitude and venue longitude

- The result from Foursquare can be displayed on a map

Source:
https://developer.foursquare.com/docs/api-reference/venues/search/#response
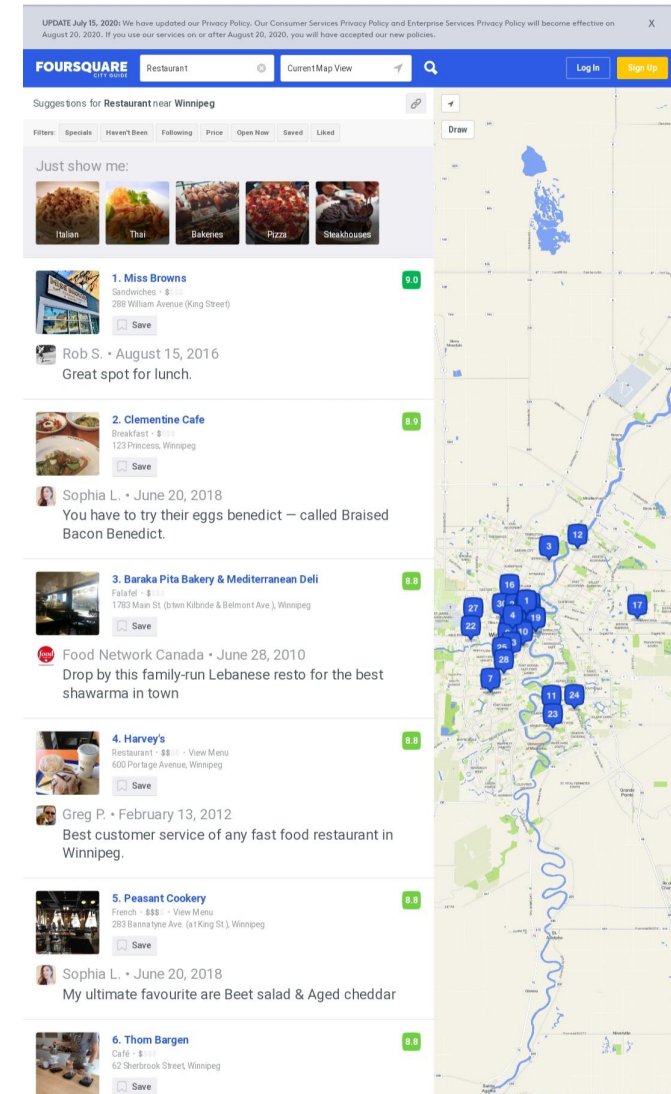
Restaurants around Winnipeg, Canada

Data Skills

- Programming in Python
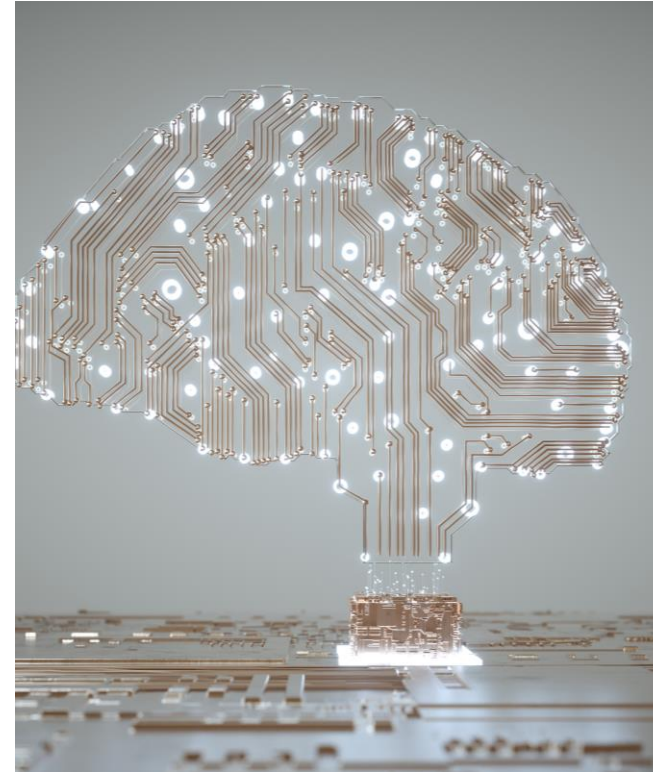- Working with Foursquare API
- Data Wrangling
- Machine Learning
- Mathematical Operations
- Map Visualisation

Data Tools

Item	Description
Python	Programming language
Python Notebook	Application to write and share code
Foursquare API	Real-time location data from the Foursquare server
Github	Repository for programmers
Geopy	To get coordinates of an address or location
Nominatim	To convert any address to latitude and longitude values
Haversine Formula	To calculate the great-circle distance between two points on a sphere
Math	For mathematical calculations
JSON	To handle JSON files
Requests	To send HTPP requests

Item	Description
KMeans	To form clusters
IPython	An Interactive command line used to display images
Matplotlib	To create static, animated and interactive visualisations
Folium	To visualise data on an interactive leaflet map
Numpy	For scientific computing
Pandas	For data analysis and manipulation
Scipy	For numerical computation
Scikit-learn	For predictive data analysis
Imbalanced-learn	Resampling techniques for balancing datasets

Methodology

Preliminaries

- Create a developer account in Foursquare

- Obtain Foursquare application credentials (Client ID and Client Secret)

- In a Python notebook, use python language to install and import the required libraries

Get the Data

- Obtain data (venue's data) from Foursquare and visualize on a map

Investigate Venue Options

- Calculate the distance between the venues using Haversine formula to aid route planning

- Get venue ratings and tips for each venue, which were independently supplied by users, who have visited the venue

- Use the venue preferences will be used to determine availability of venues of personal interest

- Create clusters of most visited venues using KMeans

- Identify venues that are trending in that location