**Location Selection of City Catering Shops(Week 1/2)**

# Introduction/Business Problem

A Client wants to open a restaurant in the area of Pudong, Shanghai. The client is new to this city and is ont bound to a specific kind of cuisine.

He want to know:

1. What kind of cuisine would attract a lot of customers
2. Which area is suitable for operating his restaurant

I will give him recommendation in this project.

# Data Analysis/Solution section

Three kinds of data are necessary to answer the business problem:

1. The location of neighborhood and restaurant with detail information in it

2. The type of restaurant Category (e.g. Fast Food Restaurant or Steakhouse)

3. The Shanghai geospatial analysis data generated by QGIS.

In the Case of the Foursquare API, the relevant data will be extracted from the 'search' and 'query' endpoint.

**Part 1**

Through three dimensions "Price Tier", "Rating" and "Cost Performance" of a restaurant, to compares different category and screens out the catering types that can open a restaurant.

According to Shanghai catering data obtained via Foursquare API , include three fields: "Price Tier", "Rating" and "Rating Signals". Therefore, we can calculate the "Cost Performance" by indicators: "Price Tier", "Rating". On this basis, we can choose catering types.

**Part 2**

Based on part 1 analysis, choose a restaurant catering type. Divide Shanghai into grid space, and evaluate the spatial index with Python to get the location of catering location. The following four indicators can be used:

Population density index

Road density index

Restaurants number index

These indicators is obtained by using QGIS for geospatial analysis.

Evaluation methods:

Population Density Index The Higher the Score, the Better

Road Density Index The Higher the Score, the Better

Restaurants Index The Higher the Score, the Better

Comprehensive Index = Population Density Index \* 0.4 + Catering Heat Index \* 0.3 + Road Density Index \* 0.2

The population density and road density are calculated by using the population grid map of Shanghai as the basic data. The Restaurants density are calculated by combining the longitude and latitude of catering shops with the catering data of Shanghai. After labeling the four indicators, the weighted average is used to get the comprehensive indicators, and the top10 area is selected as the candidate area by comprehensive ranking. Bokeh can be used to draw a square map of Shanghai according to longitude and latitude, and the alternative areas can be marked by color and size.