Recommending the ideal location to open a restaurant

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1. Introduction

1.1 Background

Penang is an island-state off the northwestern coast of Peninsular Malaysia. It comprises two halves – Penang Island, where the capital city of George Town is located, and a strip of mainland Peninsula named Seberang Perai (formerly Province Wellesley). Penang's beaches are nice, though a little lackluster when compared to those in some other Malaysian states, but this is more than compensated for by the island's rich multicultural history dating back to the beginnings of British colonization in the 18th century and is full of Malay, Chinese, Indian and European influences. Penang is also well known domestically and in Singapore for being the "food paradise" of Malaysia.

1.2 Problem

In this project we will try to find an optimal location for a restaurant. Specifically, this report will be targeted to stakeholders interested in opening a Japanese restaurant in Penang, Malaysia.

We will try to detect locations that are not already crowded with restaurants. We are also particularly interested in areas with no Japanese restaurants in vicinity. We would also prefer locations as close to city center as possible, assuming that first two conditions are met.

1.3 Interest

We will use data science to generate a few most promising neighborhoods based on this criteria. Advantages of each area will then be clearly expressed so that best possible final location can be chosen by stakeholders.

2. Data acquisition

Based on definition of our problem, factors that will influence our decision are:

- number of existing restaurants in the neighborhood (any type of restaurant)

- number of and distance to Japanese restaurants in the neighborhood, if any
- distance of neighborhood from city center

We decided to use regularly spaced grid of locations, centered around city center, to define our neighborhoods.

Following data sources will be needed to extract/generate the required information:

- centers of candidate areas will be generated algorithmically and approximate addresses of centers of those areas will be obtained using Google Maps API reverse geocoding
- number of restaurants and their type and location in every neighborhood will be obtained using Foursquare API
- coordinate of Penang center will be obtained using Google Maps API geocoding of Penang's main city, George Town