Opening a New Movie Theatre in Tokyo

1. Introduction

With a population of over 37 million people, Tokyo, is the most populated metropolitan area in the world. Modern, stylish and full of culture, the city of Tokyo provides many opportunities for entrepreneurs to open new businesses.

The cinema industry has been incredibly resilient for more than a century, and according to the Financial Times, in 2019, global cinema box office reached a new high of over $42bn. Over the last decades, the global industry sales have steadily increased. However, the main driver of this is likely the steady increase in ticket prices, rather than an increase in attendance. In fact, if we look at the US, the number of tickets purchased in 2019 was roughly 1.26 billion, which is the lowest attendance since 2011. It is however worth considering that while attendance is dropping in North America, the numbers overseas continue to rise, especially in Asia. In addition, certain experiences such as those provided by IMAX, cannot be recreated at home.

1.1 Business Problem

The objective of this project is to find the best location to open a new movie theater. In order to find the best location, we'll look at the areas with the lowest concentration of cinemas but a high concentration of what we can define as "complementary" venues. These are places that are generally visited in conjunction with movie theaters.

Restaurants can undoubtedly be considered as such "complementary" venues. People love to go out and take a bite before going to watch the latest movie at the cinema, and for this reason many restaurants often offer menu deals with tickets to the movie theater next door.

For the purpose of this project, we'll be looking at areas with a high concentration of Italian Restaurants. Italian food, or its fusion with Japanese food, Itameshi, has been one of the most loved cuisines by Japanese people since the 1990s.

1.2 Target Audience

This analysis can be useful for:

1. Entrepreneurs looking to open a new business
2. Local cinema companies looking to expand in a new area
3. Foreign cinema companies looking to expand in a new territory with little competition

2. Data Requirements and Sources

2.1 Data Requirements

To complete the analysis, we require the following data:

1. List of neighborhoods in Tokyo
2. Geographical coordinates of the neighborhoods to plot the data on a map
3. Tokyo movie theaters data
4. Tokyo Italian restaurants data

2.2 Data Sources

The list of neighborhoods in Tokyo will be extracted from this Wikipedia page.
The latitude and longitude coordinates of the neighborhoods will be retrieved using the Geocoder package. The data for movie theaters and Italian restaurants will be retrieved using the Foursquare API.

3. Methodology

3.1 Data Gathering and preparation

To start, using the BeautifulSoup Python package, I have retrieved a list of 84 neighbourhoods in Tokyo from this Wikipedia page.

Using the Geocoder package, I have found the coordinates for each neighborhood in order to use them to find nearby movie theatres and Italian restaurants.

	Neighborhood	Latitude	Longitude
0	Agariyashiki	35.726462	139.705156
1	Akihabara	35.702171	139.774409
2	Aoyama, Minato, Tokyo	35.658017	139.751546
3	Asagaya	35.704890	139.636260
4	Banchō	35.691973	139.741446

Using the Folium package, we can see the neighborhoods plotted on the map of Tokyo.

Using the FourSquare API, I found the top 100 venues that are within a radius of 2000 metres from the neighborhood coordinates. In this way, I identified 292 unique categories of venues.

3.2 Data Analysis

I created a new dataframe where I computed the mean of the frequency of occurrence of venues Movie Theater and Italian Restaurant for each neighborhood.

Then, I performed clustering on the data by using the k-means machine learning technique in order to partition the data into 3 clusters based on the similarities in frequency of occurrence of Movie Theater and Italian Restaurant venue data.

This allowed me to see which cluster has the highest concentration of those venues. Based on this, we will determine the best neighborhoods for opening a new movie theater.

4. Results

The k-means clustering technique split the data into three categories and assigned each neighborhood to a cluster based on their similarities.

We can see the different clusters in the map below.

The clusters can be interpreted as follows:

- Red cluster: Little to no venues
- Purple cluster: Highest concentration of venues
- Green: Relatively low number of venues

5. Discussion

We have successfully divided Tokyo neighbourhoods into 3 different clusters. We can see that cluster 2 (purple colour on the map) is the smallest one and has the highest concentration of movie heathers and Italian restaurants. Instead, Cluster 0 (red colour on the map) is the biggest cluster and has the lowest concentration of such venues. Cluster 1 (green colour on the map) contains a reasonable list of neighbourhoods with a relatively significant number of Italian restaurants, but with little movie theatres. In fact, the neighbourhoods in cluster 1 represent the best choice for areas to open a new movie theatre.

Looking at the neighbourhoods in cluster 2, we can see that there is one neighbourhood with a high concentration of Italian restaurants but no movie theatres, this is Hatshudai. With a quick search on Google, one can see that Hatsudai is a residential area, home to the Opera City tower and the New National Theatre. It therefore sounds like the perfect place to open a new movie theatre.

6. Conclusion

In this research, we have gone through the full journey of identifying a business problem, gathering the data required to perform the analysis, preparing the data to be ready for modelling, performed machine learning clustering technique on the data to divide the neighborhoods in 3 groups based on their similarities, and finally analysing the results to find the solution to the initial problem.

The goal of this research was to find suitable areas to open a new movie theater, prioritising areas where there are little no to movie theaters, but with a high concentration of Italian restaurants.

The analysis suggests that the neighborhoods in cluster 1 are all suitable areas to open a new movie theater. However, the best neihghborhood for our purpose is probably Hatsudai, in cluster 2, currently with no cinemas but with various Italian restaurants.