**Capstone Project: Choice of Neighborhood in Visakhapatnam for Multiplex**

**1.Introduction to the Idea:**

According to <https://www.globenewswire.com/>: The "India Multiplex Market, By Screen Type (Classic Vs. Premium), By Region, By Major States, Competition, Forecast & Opportunities, 2014 - 2024" report has been added to ResearchAndMarkets.com's offering.

The Indian Multiplex Market stood at 2950 screens in 2018 and is projected to grow at a CAGR of over 7% to surpass 4500 screens by 2024.

Growth in the Indian Multiplex Market can be attributed to increasing youth population, growing urbanization and hence, rising demand for better infrastructure and enhanced facilities in the cinemas across the country which is leading to development of multiplex market in India.

Additionally, increasing disposable income of middle-class urban population, especially in tier-I and tier-II cities has led to a shift in consumption pattern from savings to spending owing to which people are willing to pay extra for privacy and comfort. This factor is further pushing the market for multiplex in India.

Some of the leading players in the Indian Multiplex Market are PVR Cinemas, INOX Leisure Limited, Carnival Cinemas, Cinepolis India, and SRS Cinemas

In India, the Visakhapatnam city also known as the jewel of East Coast is recently crowned as the Executive Capital of Andhra Pradesh. A lot govenment plans are in progress for its further development. Increasing youth population, growing urbanization and hence, rising demand for better infrastructure and enhanced facilities in the cinemas across vi which is leading to development of multiplex market in India.

In this report we will be finding the best cluster of neihbourhoods for opening a new multiplex in Visakhapatnam,India

## **2.Problem Which Tried to Solve:**

The major purpose of this project, is to suggest a better neighbourhood in a city for the establishment of maultiplex to the relevant stakeholder.

1. Sorted list of total multiplexes in a paticular neighbourhood
2. Find the list of areas in a developing city with little or no Multiplexes

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## 3.The Location:

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**4.Description of the Dataset used:**

Data Link: <https://en.wikipedia.org/wiki/Category:Neighbourhoods_in_Visakhapatnam>

We will use visakhapatnam neighbourhood data set which we will obtain by scraping above wikipedia page.

## **Foursquare API Data:**

This project would use Four-square API as its prime data gathering source as it has a database of millions of places, especially their places API which provides the ability to perform location search, location sharing and details about a business.

We will need data about different venues in different neighborhoods of Visakhapatnam. In order to gain that information we will use "Foursquare" locational information. Foursquare is a location data provider with information about all manner of venues and events within an area of interest. Such information includes venue names, locations, menus and even photos. As such, the foursquare location platform will be used as the sole data source since all the stated required information can be obtained through the API.

After finding the list of neighborhoods, we then connect to the Foursquare API to gather information about venues inside each and every neighborhood. For each neighborhood, we have chosen the radius to be 2000 meter and a limit of 100 venues per neighbourhood.

The information obtained per venue as follows:

1. Neighborhood

2. Neighborhood Latitude

3. Neighborhood Longitude

4. Venue

5. Name of the venue e.g. the name of a store or restaurant

6. Venue Latitude

7. Venue Longitude

8. Venue Category

## **5.Work Flow:**

* Build a dataframe of neighborhoods in Visakhapatnam, India by web scraping the data from Wikipedia page
* Get the geographical coordinates of the neighborhoods by Python Geocoder package
* Obtain the venue data for the neighborhoods from Foursquare API
* Explore and cluster the neighbourhoods
* Select the best cluster to open a new shopping mall

Using credentials of Foursquare API features of near-by places of the neighborhoods would be mined. Due to http request limitations the number of places per neighborhood parameter would reasonably be set to 100 and the radius parameter would be set to 500.

# **6.Business Problem**

## This project is mainly focused on geospatial analysis of the Visakhapatnam City to understand which would be the best place to open a new Multiplex

## **Clustering Approach:**

To compare the similarities of two cities, we decided to explore neighborhoods, segment them, and group them into clusters to find similar neighborhoods . To be able to do that, we need to cluster data which is a form of unsupervised machine learning: k-means clustering algorithm

## **7.Work Flow:**

Using credentials of Foursquare API features of near-by places of the neighborhoods would be mined. Due to http request limitations the number of places per neighborhood parameter would reasonably be set to 100 and the radius parameter would be set to 2000.

## **8.Libraries Which are Used to Develope the Project:**

Pandas: For creating and manipulating dataframes.

Folium: Python visualization library would be used to visualize the neighborhoods cluster distribution of using interactive leaflet map.

Scikit Learn: For importing k-means clustering.

JSON: Library to handle JSON files.

Geocoder: To retrieve Location Data.

Beautiful Soup and Requests: To scrap and library to handle http requests.

Matplotlib: Python Plotting Module.

**9.Final observation**

### A good number of Multiplexes are concentrated in the central area of Visakhapatnam city, with the highest number in cluster 2 and moderate number in cluster 3 . This represents a great opportunity and high potential areas to open new Multiplexes as there is very little to no competition from existing Multiplexes in areas of clusters 1 and 0 . Meanwhile, Multiplexes in cluster 2 are likely suffering from intense competition due to oversupply and high concentration of shopping malls. Therefore, this project recommends property stakeholders to capitalize on these findings to open new Multiplexes in neighbourhoods in cluster 0 with no competition. Property stake holders with unique selling propositions to stand out from the competition can also open new shopping malls in neighbourhoods in cluster 1 and 3 with little and moderate competition respectively. Lastly, property developers are advised to avoid neighbourhoods in cluster 2 which already have a high concentration of shopping malls and suffering from intense competition.

### We also see that the existing 111 Multiplexes of visakhapatnam are limited to just 41 neighbourhoods out of its total 125 neighbours is an important insight that about 75% of neighbourhoods are void of these Multiplex inftastructures