

eSports and Amusement arcade

-Finding Location to setup eSports and Amusement arcade

eSports & Amusement arcade

- ▶ Esports (also known as electronic sports, e-sports, or eSports) is a form of competition using video games.
- ▶ eSports was a significant factor in the game industry.
- ▶ Participation by professional gamers and spectatorship in these sports through live streaming saw a large surge in popularity.
- ▶ An amusement arcade (often referred to as "video arcade" or simply "arcade") is a venue where people play arcade games.
- ▶ people play arcade games such as video games, pinball machines, electro-mechanical games, redemption games, merchandisers (such as claw cranes), or coin-operated billiards or air hockey tables.
- ▶ A startup having plans to setup eSports and Amusement arcades chain in India.

Importance of City and Location

- ▶ Competitive advantage: More sales, Superior margins
- ▶ Growth: More options for expansion
- ▶ Returns: the most common profitability ratio
- ▶ Business values: health and well-being of the firm in the long run
- ▶ Competition: cost of location analysis
- ▶ Visibility: attract the consumer traffic from the mall without having to pay exorbitant rental costs.

Data acquisition and cleaning

- ▶ The city and state or union territory list can be found in Wikipedia page.
- ▶ https://en.wikipedia.org/wiki/List_of_million-plus_urban_agglomerations_in_India
- ▶ The per-capita income for the state or union territory list can be found in Wikipedia page.
- ▶ https://en.wikipedia.org/wiki/List_of_Indian_states_and_union_territories_by_GDP_per_capita
- ▶ The location data and geographical location coordinates are obtained by leveraging foursquare location data.
- ▶ Several preprocessing methods like Drop, strip, merge etc., were used to clean the data during scraping and preprocessing.
- ▶ There were 1557 Venues and 7 features in the raw dataset.
- ▶ There were 183 unique venue categories.
- ▶ There were 1109 Venues after dropping the venues with weight less than 3.

Feature Selection

Kept features	Dropped features	Reason for dropping features
State union Territory	Data year	Data year is the year on which the per capita income was calculated, it is of no use
Population (2011)	Per capita PPP	This is IMF PPP Conversion rate hence it is dropped
Population (2001)	Comparable country by DGP per capita	We were interested in knowing the states of India per capita income hence the comparable country was dropped
Rank		
Per capita income		
Per capita income State or union territory		

Methodology & Exploratory Data Analysis

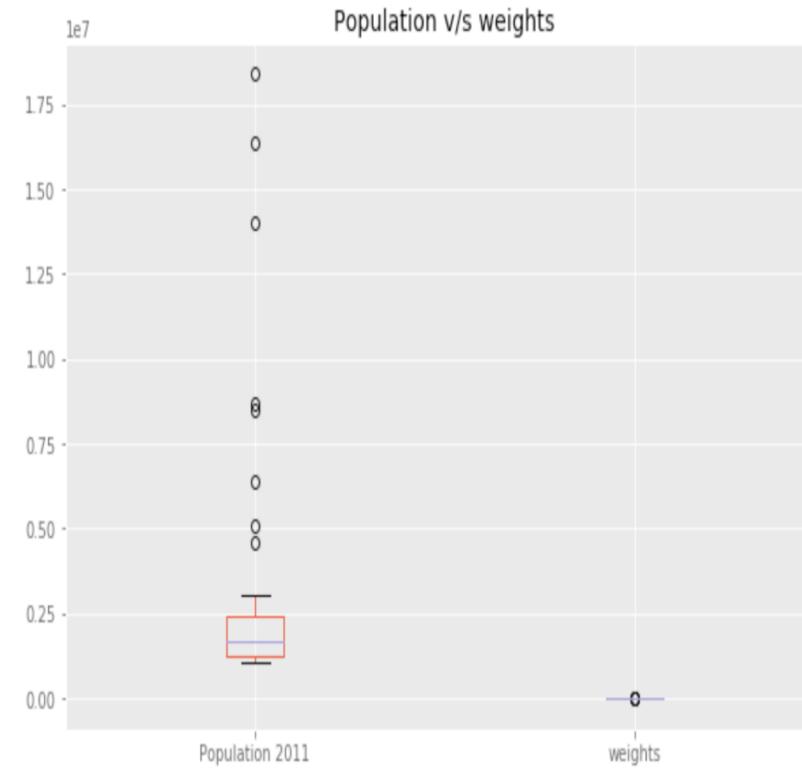
Finding the Location- India Cities

- ▶ Finding location among the 53 top India cities with available data was not straight forward, with the scraped data all the Indian cities were visualized for geographical locations for possible visual information.



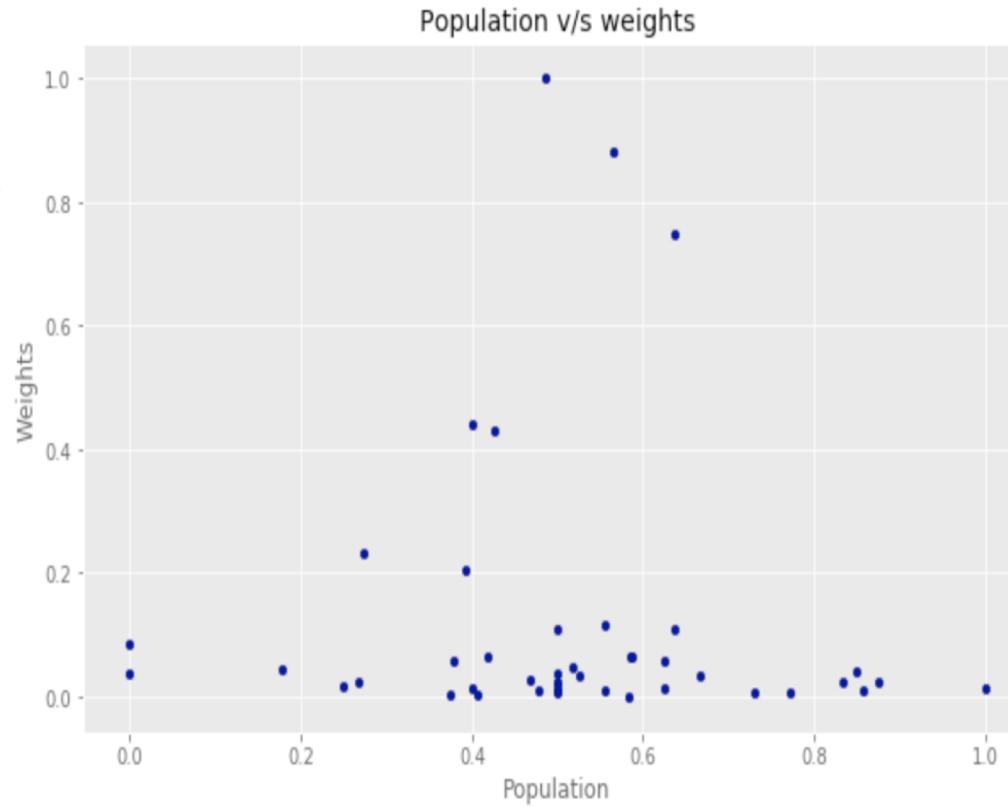
Finding the Location - Population v/s Weights

- ▶ Population and weights were visualized to find some interesting information such that there almost 8-10 cities with huge population. One of these may a prospect for the project and some may be considered for future. Find below the box plot.



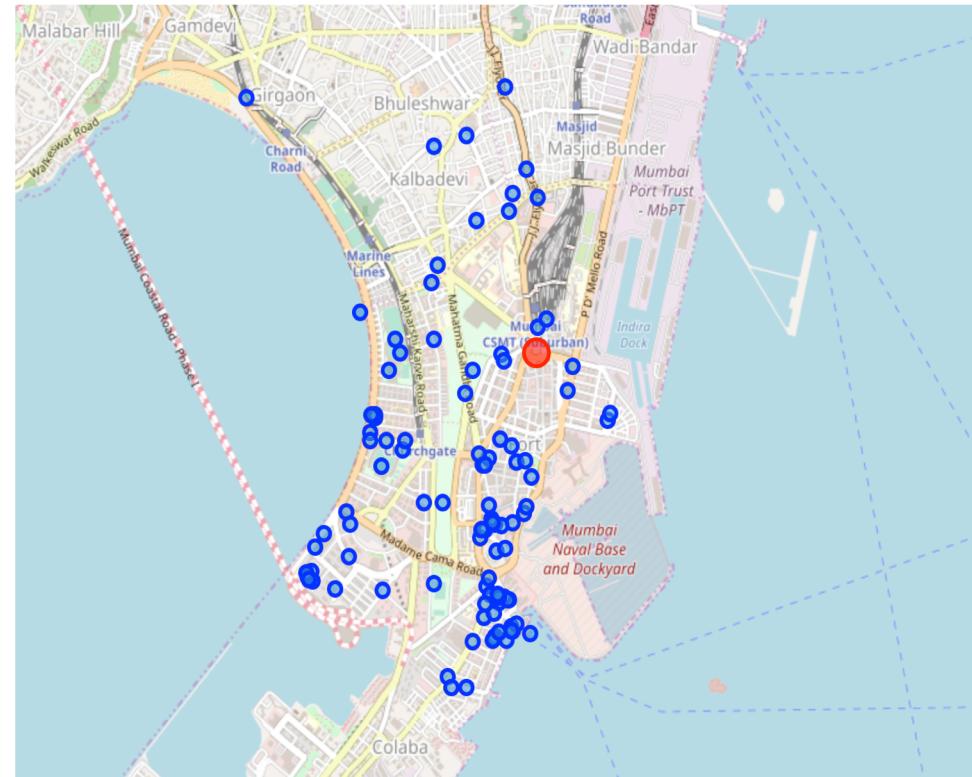
Finding the Location - City Population and weights

- ▶ The location weight is at high with average city population and the weight of the location is really low when the city population is either very high or low. This may be good information for future. Find below scatter plot.



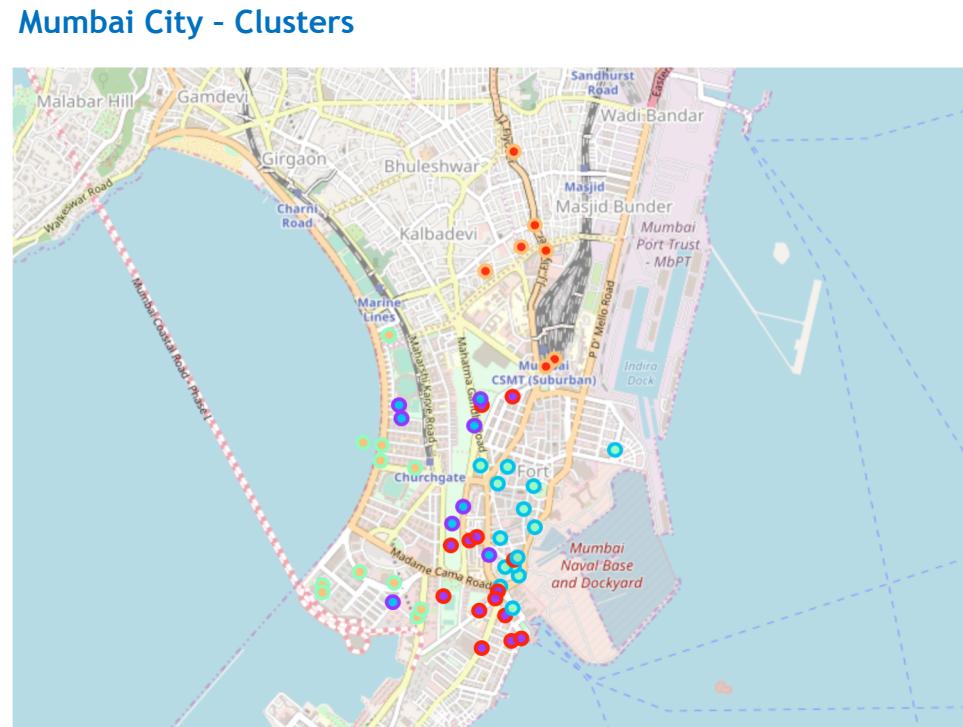
Map of Mumbai City by Venue Categories

- ▶ By visualization the Model selected City shows that the area covered by venues is large and almost all parts of Mumbai has good number of popular venues which makes it crucial to analyze the data and find best suitable place for eSports and Amusement Arcade.



K-Means Clustering

- ▶ Total number of clusters are selected as 5. The center points are randomly initialized, and 5 different groups were visualized on Mumbai city Map to check and understand the distinct groupings. Each Venue Category is classified by computing the distance between that point and each cluster center.



Result: K-Means Clustering Final Location

- ▶ The best location to setup eSports & Amusement arcade is found based on the cluster's weights.
- ▶ The cluster weights are found by taking the average of all Venue categories' weight in the respective clusters.
- ▶ The new eSports & Amusement arcade can be setup within 2 kilometers radius for geo coordinates (18.9268,72.8314) location in Mumbai City.



Conclusion

- ▶ In this study I analyzed various cities in India and several states.
- ▶ The features like city population, per capita income for each state, geographical locations, Venues categories people most visit are considered along with randomly assigned weight for each venue category.
- ▶ K means clustering machine learning technique is used to find the final location in the Mumbai city.
- ▶ Based on the problem statement Mumbai city has been found as the best city to setup eSports & Amusement Arcade, a location within Mumbai city is found using the clusters and average weight of clusters.
- ▶ K means clustering technique is very useful in identifying locations similarly for various other cities.

Discussion & Future Directions

- ▶ K means clustering model works mainly based on the features selected and the number of clusters used.
- ▶ It is possible to use the foursquare API radius with bigger radius search to find more venues and categories.
- ▶ Also, more features can be added based on the data and its available source.
- ▶ In the Four-Square API, we have queried the Venues of a locality by specifying the LIMIT and Radius of our choice.
- ▶ We have chosen less LIMIT as the number of API calls that can be done using a free account in Four Square is limited.
- ▶ We can increase the limit for more accurate results.