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Business Ideas for different areas of Gurugram, India

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An aerial view of a city

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# Introduction

Positioning has always been an important element of setting up a business. Your success as a business depends on how well you are positioned to be found. Positioning includes various factors, from location to the price of your product or service to the message you use to promote the business, online and offline.

A lot of times, a business simply misses out getting the traction it deserves, due to inadequate positioning. For ex. If you set up a high-end clothing apparel’s showroom in the middle of a slum, it would never be pinpointed by its target audience. On the other hand, if you place it next to an exquisite restaurant, it would be easily noticed by the fancy customers who come there to dine.

Hence, it is necessary for every aspiring entrepreneur to pick out the location to attract the appropriate target audience for their business, keeping in mind the nearby points of attraction of the neighborhood.

## Data

To address the problem, the following data were used:

1. Areas in Gurgaon represented by different pin codes. (scraped from <https://gurugram.gov.in/std-pin-codes/>)

Ex. Akhera B.O-122107

1. Coordinates (latitudes and longitudes) of the pin codes representing Gurgaon. (extracted from <https://www.google.com/search?q=coordinates+of+pincodes+of+gurgaon&rlz=1C1CHBF_enIN883IN883&oq=coordinates+of+pincodes+of+gurgaon&aqs=chrome..69i57.17612j0j7&sourceid=chrome&ie=UTF-8> )

Ex. 122001- 28.4555N, 77.0219E

1. Average plot price in different areas of Gurgaon (extracted from 99acres.com, propertywala.com)

Ex. Arjun Colony-Rs. 1,20,000

1. Exploratory data representing top 10 most visited venues around an area. For ex. Cafes, ATM, etc around Palam Vihar. (Data received by making calls to Foursquare API)

## Methodology

**Web Scraping**

The process starts with extracting the details of various pin codes represented under the umbrella of Gurgaon. The data is facilitated by the official government documentation at <https://gurugram.gov.in/std-pin-codes/>

To extract the data, we scraping the data employing a brilliantly useful Python package called **Beautiful Soup**.

Beautiful Soup is a Python library for getting data out of HTML, XML, and other markup languages. Say you have found some webpages that display data relevant to your research, such as date or address information, but that do not provide any way of downloading the data directly. Beautiful Soup helps you pull content from a webpage, remove the HTML markup, and save the information. It is a tool for web scraping that helps you clean up and parse the documents you have pulled down from the web.

One of the primitive things Beautiful Soup can help us with is locating content that is buried within the HTML structure. Beautiful Soup allows you to select content based upon tags. To get a good view of how the tags are nested in the document, we use the method “prettify” on our soup object.

In our code, we extract the data from a table and hence the code segment:

locality = soup.select('table')[-1]

locality\_rows = locality.find\_all('tr')

A screenshot of a cell phone

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**Location Data**

After successfully extracting the data representing all pin codes under Gurgaon, we combine the data with its general coordinates to further plot the various areas on maps and clusters.

**Map of Gurugram**

To represent the pin codes considered by us, on a map, we use the Python library, **Folium.**

[Folium](https://python-visualization.github.io/folium/index.html) is a Python library used for visualizing geospatial data. It is easy to use and yet a powerful library. Folium is a Python wrapper for [Leaflet.js](https://leafletjs.com/) which is a leading open-source JavaScript library for plotting interactive maps.

It has the power of Leaflet.js and the simplicity of Python, which makes it an excellent tool for plotting maps. Folium is designed with simplicity, performance, and usability in mind. It works efficiently, can be extended with a lot of plugins, has a beautiful and easy-to-use API.

A close up of a map

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**Foursquare API**

**A picture containing drawing

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To extract the exploratory information regarding 10 most visited venues of our selected areas (represented by respective pin codes), we employ the lovely goldmine of geospatial data, **Foursquare API**.

The Foursquare Places API provides location-based experiences with diverse information about venues, users, photos, and check-ins. The API supports real time access to places, Snap-to-Place that assigns users to specific locations, and Geo-tag. Additionally, Foursquare allows developers to build audience segments for analysis and measurement. JSON is the preferred response format.

**Clustering**

Areas with similar characteristics are clustered together to give similar business plans as solution.

This is done by making use of machine learning technique of **clustering**.

**Clustering** is one of the most common exploratory data analysis technique used to get an intuition about the structure of the data. It can be defined as the task of identifying subgroups in the data such that data points in the same subgroup (cluster) are very similar while data points in different clusters are very different. In other words, we try to find homogeneous subgroups within the data such that data points in each cluster are as similar as possible according to a similarity measure such as Euclidean-based distance or correlation-based distance. The decision of which similarity measure to use is application specific.

The features being employed to carry out clustering are the category of top 10 most visited venues in the different areas being considered as well as the normalised plot price in each of these areas.

**Silhouette Score**

To find out the optimum number of clusters to analyse the data, we find the **silhouette score** of the feature’s dataset.

It is calculated for each instance and the formula goes like this:

***Silhouette Coefficient = (x-y)/ max(x,y)***

where, **y** is the mean intra cluster distance: mean distance to the other instances in the same cluster. **x** depicts mean nearest cluster distance i.e. mean distance to the instances of the next closest cluster.

The coefficient varies between -1 and 1. A value close to 1 implies that the instance is close to its cluster is a part of the right cluster. Whereas, a value close to -1 means that the value is assigned to the wrong cluster.

A close up of a mans face

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As you can see, we get a global maximum at k=4. Hence, we form 4 clusters to analyse the areas.

**K-means**

**K-means** algorithm is an iterative algorithm that tries to partition the dataset into *K* pre-defined distinct non-overlapping subgroups (clusters) where each data point belongs to **only one group**. It tries to make the intra-cluster data points as similar as possible while also keeping the clusters as different (far) as possible. It assigns data points to a cluster such that the sum of the squared distance between the data points and the cluster’s centroid (arithmetic mean of all the data points that belong to that cluster) is at the minimum. The less variation we have within clusters, the more homogeneous (similar) the data points are within the same cluster.

## Results

After applying k-means clustering, we receive four clusters of areas as follows:

**Cluster 1**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pin code | Area | 1st Most Common Venue | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th | Relative Plot Price |
| 122003 | Gurgaon Sector 45 S.O, Gwal Pahari B.O, Hailym... | Food Truck | Women's Store | Café | Garden Center | Fast Food Restaurant | Electronics Store | Donut Shop | Diner | Department Store | Coffee Shop | 0.848485 |

**Cluster 2**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pin code | Area | 1st Most Common Venue | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th | Relative Plot Price |
| 122004 | Khandsa B.O, Kherki Kaula B.O, Lakhnaula B.O, ... | Business Service | Shopping Mall | Women's Store | Food Truck | Fast Food Restaurant | Electronics Store | Donut Shop | Diner | Department Store | Coffee Shop | 0.424242 |
| 122007 | Industrial Estate S.O (Gurgaon) | Hotel | Garden Center | Indian Restaurant | Bed & Breakfast | Shoe Store | Japanese Restaurant | Pizza Place | Brazilian Restaurant | Chinese Restaurant | Fast Food Restaurant | 0.000000 |
| 122009 | Galleria DLF-IV S.O | Café | Indian Restaurant | Hotel | Bakery | Coffee Shop | Italian Restaurant | Sandwich Place | Restaurant | Bistro | Market | 0.248485 |
| 122015 | Palam Road S.O, Sarhaul B.O | ATM | Indian Restaurant | Café | Food Truck | Fast Food Restaurant | Electronics Store | Donut Shop | Diner | Department Store | Coffee Shop | 0.000000 |
| 122017 | Carterpuri B.O, Palam Vihar S.O (Gurgaon) | Tennis Court | Shopping Mall | Market | Café | Women's Store | Business Service | Fast Food Restaurant | Electronics Store | Donut Shop | Diner | 0.280606 |

**Cluster 3**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pin code | Area | 1st Most Common Venue | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th | Relative Plot Price |
| 123401 | Kankarwali Rewari S.O | Women's Store | Café | Garden Center | Food Truck | Fast Food Restaurant | Electronics Store | Donut Shop | Diner | Department Store | Coffee Shop | 0.515152 |

**Cluster 4**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pin code | Area | 1st Most Common Venue | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th | Relative Plot Price |
| 122001 | Arjun Nagar S.O, Basai Road S.O, Gurgaon H.O, ... | Electronics Store | Shopping Plaza | Lighting Store | Gift Shop | Women's Store | Café | Food Truck | Fast Food Restaurant | Donut Shop | Diner | 0.484848 |
| 122002 | Chakkarpur B.O, DLF QE S.O, Nathupur B.O | Indian Restaurant | Café | Sandwich Place | Chinese Restauran | Office | Pharmacy | Pizza Place | Liquor Store | Bakery | Coffee Shop | 0.763636 |
| 122010 | DLF Ph-III S.O | Café | Asian Restaurant | Department Store | Mediterranean Restaurant | Women's Store | Food Truck | Fast Food Restaurant | Electronics Store | Donut Shop | Diner | 0.569697 |
| 122011 | Gurgaon Sector | Gym | Market | Snack Place | Bakery | Pizza Place | Miscellaneous Shop | Fast Food Restaurant | Electronics Store | Donut Shop | Diner | 0.909091 |
| 122016 | Dundahera B.O, Indir Mewat B.O, Industrial Com... | Pizza Place | Fast Food Restaurant | Thai Restaurant | Tea Room | Donut Shop | Indian Restaurant | Diner | Sandwich Place | Café | Business Service | 0.515152 |
| 122018 | Gurgaon South City II S.O | Shopping Mall | BBQ Joint | Department Store | Club House | Women's Store | Café | Food Truck | Fast Food Restaurant | Electronics Store | Donut Shop | 1.000000 |

## Discussions

Based on the data presented in the above section, following observations can be made for the clusters:

**Cluster 1**

* The relative plot price is high; hence the area experiences a great footfall.
* The most frequently visited venues are women’s stores and food stores, hence making women- the target audience.

**Cluster 2**

* The relative plot prices are way lower.
* The cluster reflects an “idealistic local shopping complex with ATM’s and stores of all kinds” scenario, which isn’t the highlight of the city (but frequent enough) and hence offers great opportunities of establishment.

**Cluster 3**

* The cluster is very similar to Cluster 1, but with lower plot price.

**Cluster 4**

* The cluster represents an ideal “on-the-run” characteristics with venues representing the necessity visits as well as the lifestyle visits of the younger generation (electronics stores, unconventional food stores, etc), hence making the age group 16-30 as the target audience.

## Conclusion

After carefully examining the presented characteristics of each cluster, the following business plans can be recommended for areas lying in the cluster:

**Cluster 1: Salon, Spa, beauty parlors, etc.**

**Cluster 2: Jewelry store, high-end bakery, etc.**

**Cluster 3: Salon, Spa, beauty parlors, bakery etc.**

**Cluster 4: Gaming arena, Clubs, Party halls, etc.**