

# **STUDY TASK ON MARKET SEGMENTATION**

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## **1.1 Introduction to Market Segmentation**

Market segmentation is a marketing term that refers to aggregating prospective buyers into groups or segments with common needs and who responds similarly to a marketing action. Market segmentation enables companies to target different categories of consumers who perceive the full value of certain products and services differently from one another. Or in other words Market segmentation is a process that consists of sectioning the target market into smaller groups that share similar characteristics, such as age, income, personality traits, behavior, interests, needs or location.

Companies can generally use three criteria to identify different market segments:

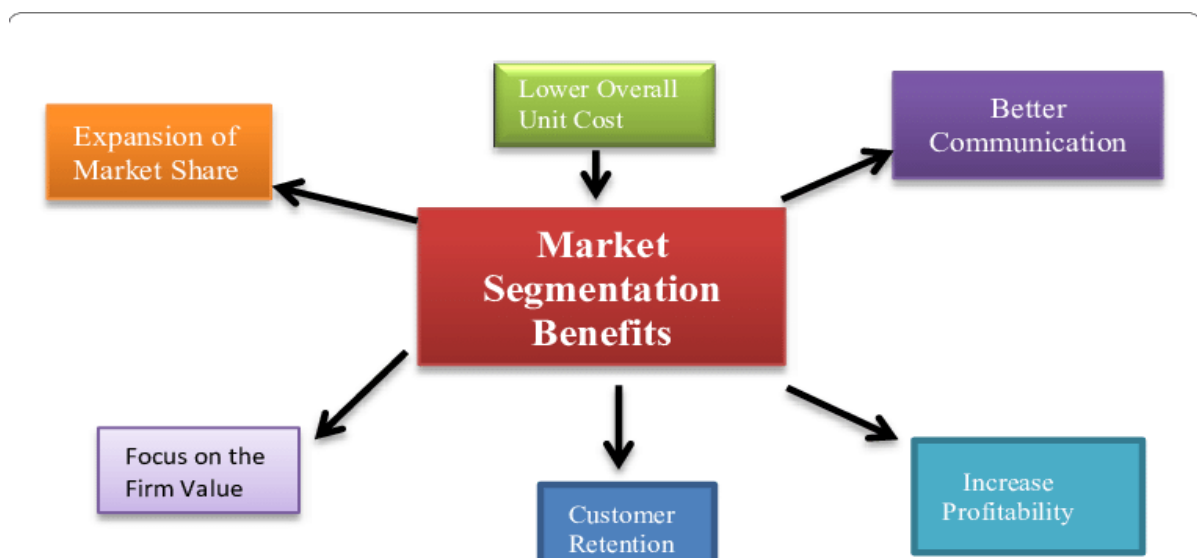
1. **Homogeneity** or common needs within a segment.
2. **Distinction** or being unique from other groups.
3. **Reaction** or a similar response to the market.

For example, an athletic footwear company might have market segments for basketball players and long-distance runners. As distinct groups, basketball players and long-distance runners respond to very different advertisements. Understanding these different market segments enables the athletic footwear company to market its branding appropriately. Segmentation allows brands to create strategies for different types of consumers, depending on how they perceive the overall value of certain products and services. In this way they can introduce a more personalized message with the certainty that it will be received successfully.

## 1.2 Benefits of Market Segmentation

Market segmentation has a number of benefits. At the most general level, market segmentation forces organizations to take stock of where they stand, and where they want to be in future. In so doing, it forces organizations to reflect on what they are particularly good at compared to competitors, and make an effort to gain insights into what consumers want. Market segmentation offers an opportunity to think and rethink, and leads to critical new insights and perspectives. Efficient market research and market segmentation help to save a lot of useful time, money, and resources invested in the marketing campaign. Also, as the customers are grouped as per their needs, commonalities, choices, statuses, etc. it becomes easy to target the audience for the marketers.

Implementing market segmentation requires a substantial investment by the organization. A large number of people have to dedicate a substantial amount of time to conduct a thorough market segmentation analysis. If a segmentation strategy is pursued, more human and financial resources are required to develop and implement a customized marketing mix.



## 2.1 Market Segmentation Objectives

There are different market segmentation objectives. Here we tell you what each of them are:

- **Product:** Creating successful products is one of the main objectives of organizations and one of the reasons why they conduct market research. This allows you to add the right features to your product and will also help you reduce costs to meet the needs of your target audience.
- **Price:** Another objective of market segmentation is to establish the right price for your products. Identifying which is the public that will be willing to pay for it.
- **Promotion:** It helps you to target the members of each segment and select them in different categories so that you can direct your strategies appropriately.
- **Place:** The ultimate goal of segmentation is to decide how you offer a product to each group of consumers and make it pleasant to them.

## 3. Steps to Implement Market Segmentation

### Step 1: Deciding to Segment

At this point of the segmentation, you should focus on discovering how big the market is, where your brand fits and if your products have the capacity to solve what it promises. For this case study, we will be using the 'mcdonald.csv' dataset to derive different segments based on customers feedback to any product served by the McDonald's.

### Step 2: Specifying the Ideal Target Segments

This step consists of choosing which of the types best suits your brand. For this dataset we decided to target ‘Yummy’ and ‘Convenient’ segments. And by understanding the data, we think the target customer must be between age 30-65. Although while look at the data, we found out that the columns ‘VisitFrequency’ was very effective or useful. So, we decided to give it maximum priority.

### **Step 3: Collecting Data**

There are four primary types of market segmentation. However, one type can usually be split into an individual segment and an organization segment. Therefore, below are five common types of market segmentation.

#### **➤ Demographic Segmentation**

Demographic segmentation is one of the simple, common methods of market segmentation. It involves breaking the market into customer demographics as age, income, gender, race, education, or occupation. This market segmentation strategy assumes that individuals with similar demographics will have similar needs.

#### **➤ Firmographic Segmentation**

Firmographic segmentation is the same concept as demographic segmentation. However, instead of analyzing individuals, this strategy looks at organizations and looks at a company's number of employees, number of customers, number of offices, or annual revenue.

#### **➤ Geographic Segmentation**

Geographic segmentation is technically a subset of demographic segmentation. This approach groups customers by physical location, assuming that people within a given geographical area may have

similar needs. This strategy is more useful for larger companies seeking to expand into different branches, offices, or locations.

### ➤ **Behavioral Segmentation**

Behavioral segmentation relies heavily on market data, consumer actions, and decision-making patterns of customers. This approach groups consumers based on how they have previously interacted with markets and products. This approach assumes that consumers prior spending habits are an indicator of what they may buy in the future, though spending habits may change over time or in response to global events.

### ➤ **Psychographic Segmentation**

Often the most difficult market segmentation approach, psychographic segmentation strives to classify consumers based on their lifestyle, personality, opinions, and interests. This may be more difficult to achieve, as these traits i. may change easily and ii. may not have readily available objective data. However, this approach may yield strongest market segment results as it groups individuals based on intrinsic motivators as opposed to external data points.

To get collect data effectively one can ask their customers the right questions, depending on the type you chose. You must know your target audience in detail. You can use online surveys to get their answers. For the 'McDonalds' dataset to collect data we can perform some online surveys for their customer or get their feedback after each meal they get, this can be optional. Most of the Restaurants or Cafes, like to get their customers mobile number while taking their orders, and once the customer pays for their meal, they will give a short survey form on their respective mobile number. This is one of the most effective ways to get genuine data from real customers.

## Step 4: Exploring Data

Data exploration helps to

- (1) Identify the measurement levels of the variables;
- (2) Investigate the univariate distributions of each of the variables; and
- (3) Assess dependency structures between variables.

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1453 entries, 0 to 1452
Data columns (total 15 columns):
#   Column              Non-Null Count  Dtype
---  -
0   yummy               1453 non-null   object
1   convenient          1453 non-null   object
2   spicy               1453 non-null   object
3   fattening           1453 non-null   object
4   greasy              1453 non-null   object
5   fast                1453 non-null   object
6   cheap               1453 non-null   object
7   tasty               1453 non-null   object
8   expensive            1453 non-null   object
9   healthy              1453 non-null   object
10  disgusting           1453 non-null   object
11  Like                 1453 non-null   object
12  Age                  1453 non-null   int64
13  VisitFrequency       1453 non-null   object
14  Gender               1453 non-null   object
dtypes: int64(1), object(14)
memory usage: 170.4+ KB
```

The dataset which is provided is called ‘mcdonalds.csv’. After loading the data, the first thing that we should do is to explore and get useful insights from it.

The image on the right shows the columns/features that are contained with our dataset.

Also, while checking for any NULL values or for missing values, we did not find any such values. There was neither missing values in the dataset, nor any null values. But there were some observations that were easy to understand by humans but a little hard to understand for the machine so we need to change observations like ‘I hate it!-5’ to just ‘-5’ and so on. For the like columns the rating were from -5 to +5, so instead of just using them, we categorized them as ‘Good’ to ‘Bad’, where ‘Bad’ being -5 to -1, 0 to +2 being ‘Average’ and +3 to +5 being ‘Good’. In this way we can easily segment and distinguish 'Bad' reviews from 'Good' reviews. We essentially continued the same trend and did the same for each column, so it was easier for the model to interpret.

## Step 5: Extracting Segments

The result of the market segmentation analysis is determined by the underlying data which are chosen by different extraction algorithm. There are several market segmentation methods which are a type of cluster analysis. Selecting suitable clustering requires matching the data analytic features of the resulting clustering with the context dependent requirements that are desired by the researcher. Therefore, exploring different clustering algorithm are important.

For the McDonalds dataset, the data are present in categorical order such as good and bad, yes or no etc. and need to be converted to some numerical form to feed it to suitable clustering algorithm.

	yummy	convenient	spicy	fattening	greasy	fast	cheap	tasty	expensive	healthy	disgusting	Like	Age	VisitFrequency	Gender
0	No	Yes	No	Yes	No	Yes	Yes	No	Yes	No	No	Bad	61	Every three months	Female
1	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Average	51	Every three months	Female
2	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Average	62	Every three months	Female
3	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Good	69	Once a week	Female
4	No	Yes	No	Yes	Yes	Yes	Yes	No	No	Yes	No	Average	49	Once a month	Male

After conversion

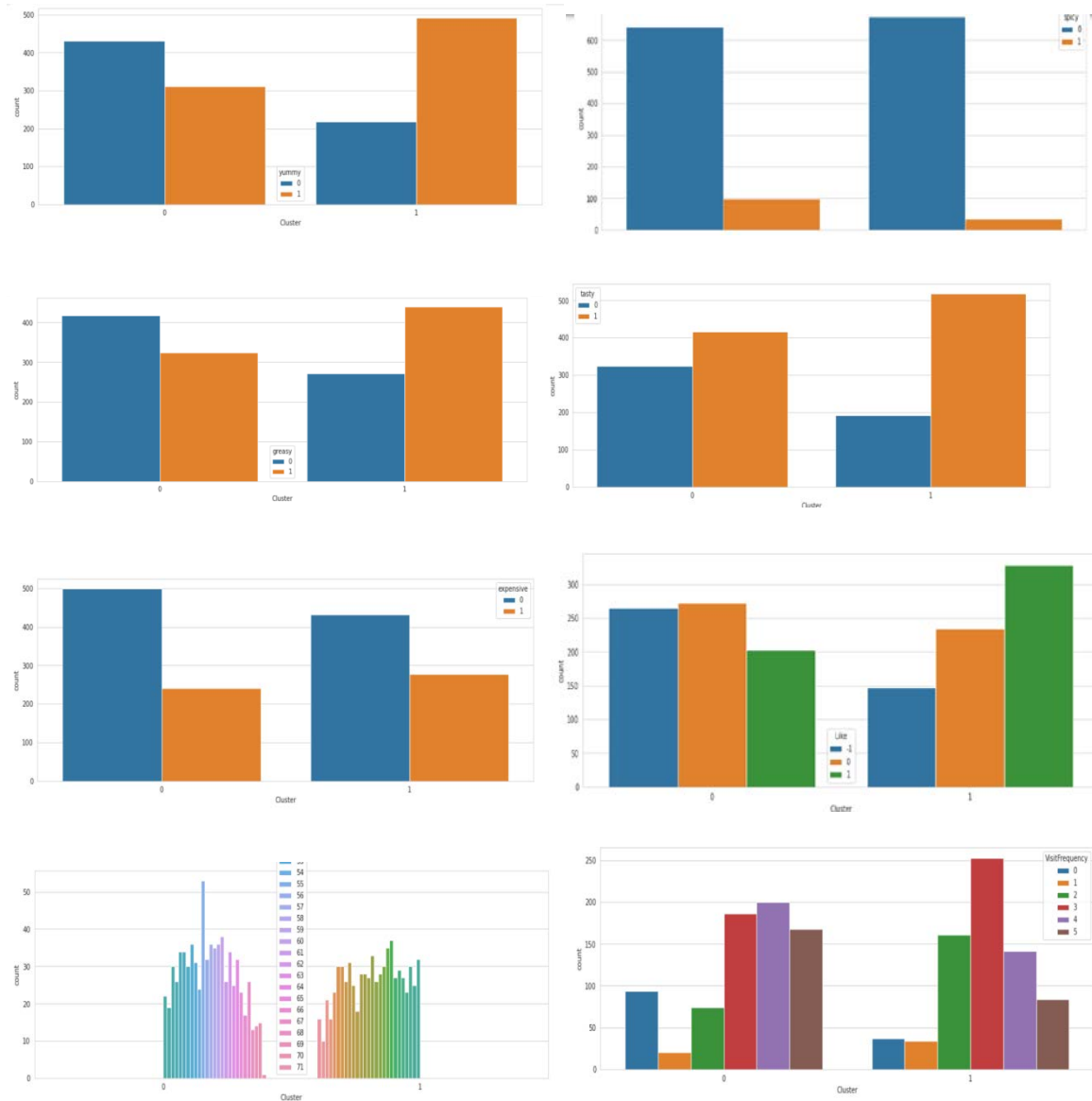
	yummy	convenient	spicy	fattening	greasy	fast	cheap	tasty	expensive	healthy	disgusting	Like	Age	VisitFrequency	Gender
0	0	1	0	1	0	1	1	0	1	0	0	-1	61	4	0
1	1	1	0	1	1	1	1	1	1	0	0	0	51	4	0
2	0	1	1	1	1	1	0	1	1	1	0	0	62	4	0
3	1	1	0	1	1	1	1	1	0	0	1	1	69	2	0
4	0	1	0	1	1	1	1	0	0	1	0	0	49	3	1

Then some EDA is performed on the data to get a deeper understanding of the data and how the different features are inter-correlated to each other. Which age customer visit the shop more, how often they visit, what are the different features for which customer are getting more attracted.

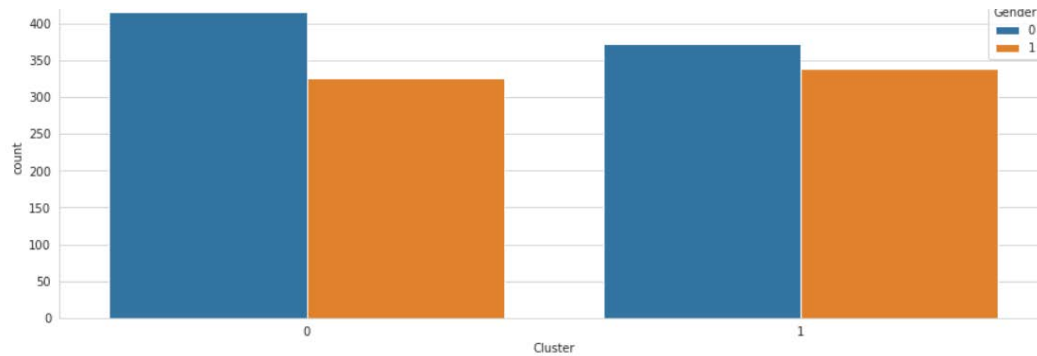
## Clustering

As the data present here are in categorical order so applying K-means algorithm would be inappropriate. So, K-mode clustering algorithm

would be a better choice. It picks any attribute at random, assigns it as leader, calculates the dissimilar cluster and puts similar observation close to it cluster. Using K-modes clustering algorithm the following are my conclusion.







Based on the plots above, these are the insights that I was able to gather. There may be more insights that I'm not seeing, or other visualization methods could show more interesting observations.

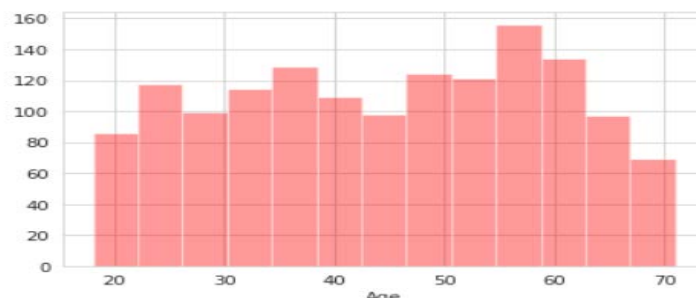
```
yummy: Larger population of people who finds yummy falls in cluster 1.
spicy: Larger population of people who finds spicy falls in cluster 0.
greasy: Larger population of people who finds yummy greasy in cluster 0.
tasty: Larger population of people who finds tasty falls in cluster 1.
expensive: Larger population of people who finds not expensive falls in cluster 0.
Like: Larger population of people who finds the service good falls in cluster 1.
Age: People will age around 35 to 50 visits the more and falls in cluster 0.
VisitFrequency: People who visits the store once a month are more present in cluster 1.
Gender: More female visits the store and more of them falls in cluster 0.
```

## Step 6: Profile Segments

The aim of the profiling step is to get to know the market segments resulting from the extraction step. Profiling is only required when data-driven market segmentation is used. For commonsense segmentation, the profiles of the segments are predefined.

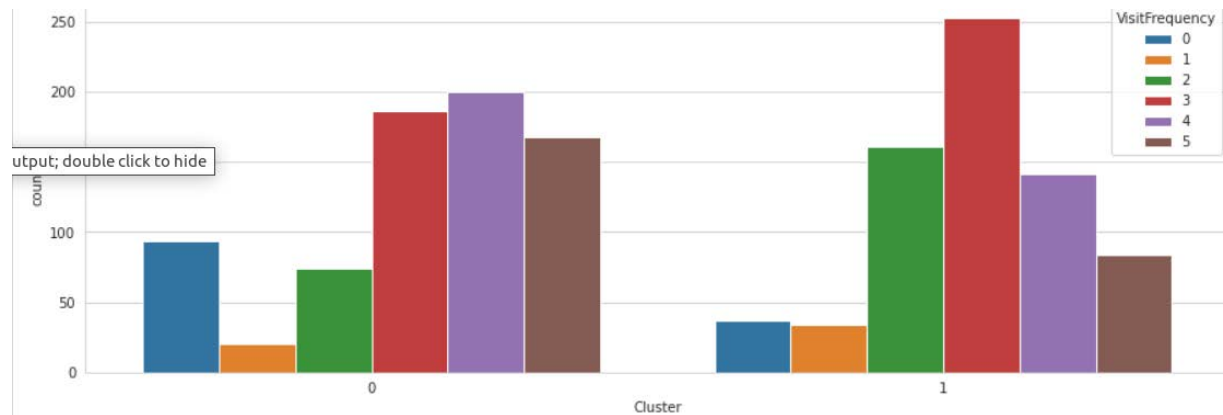
For the McDonalds dataset:

Age:



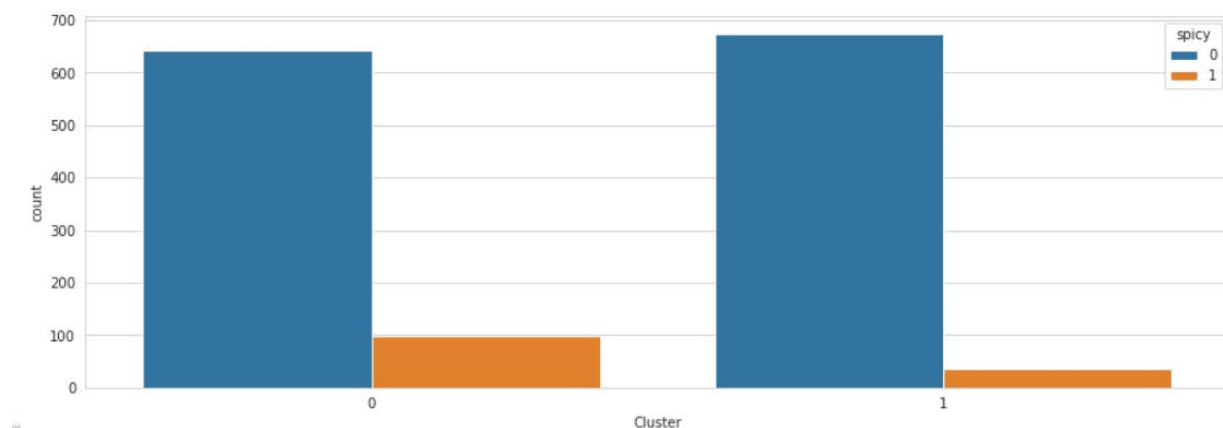
From the above it is seen that Age group from 35 to 40 and 48 to 60 visits the store more often.

### Visit Frequency:



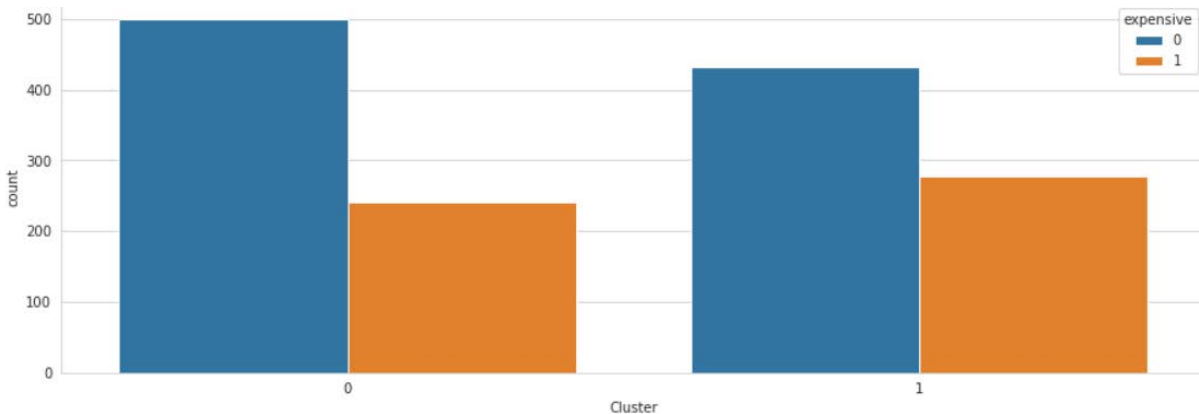
This plot reveals the customer behavior of visit the store. Looking cluster 1 it can be concluded that customer who visits the store once a month are more in numbers. There are also some good number of customers who never visits the shop due to some reason and falls in cluster 0. So, focus on to that would be a good business strategy.

### Spicy:



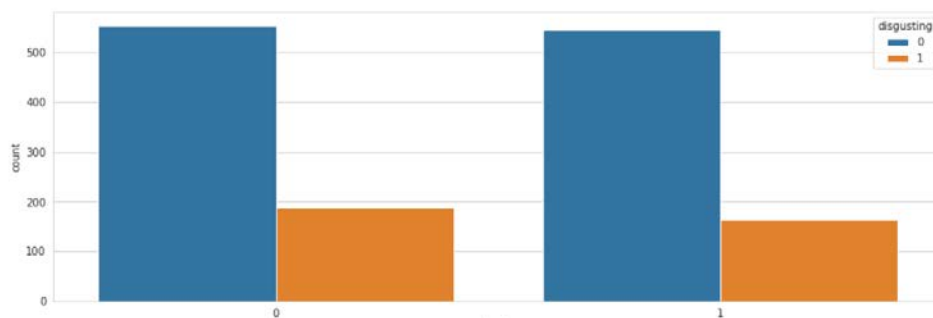
Thus, spicy food is more common among the female as compared to the male.

Expensiveness:



From the above, less expensive more liked by the customer. Also, there are a good number of customers who liked expensive food. Cluster 1 contains more customer who could afford the expensive food.

Disgusting:



The above plot reveals that the food is more liked by the male as compared to the female. Thus, food which are more popular with the female or might be the decoration or the spiciness of the food should be more balanced to reduce the gap.

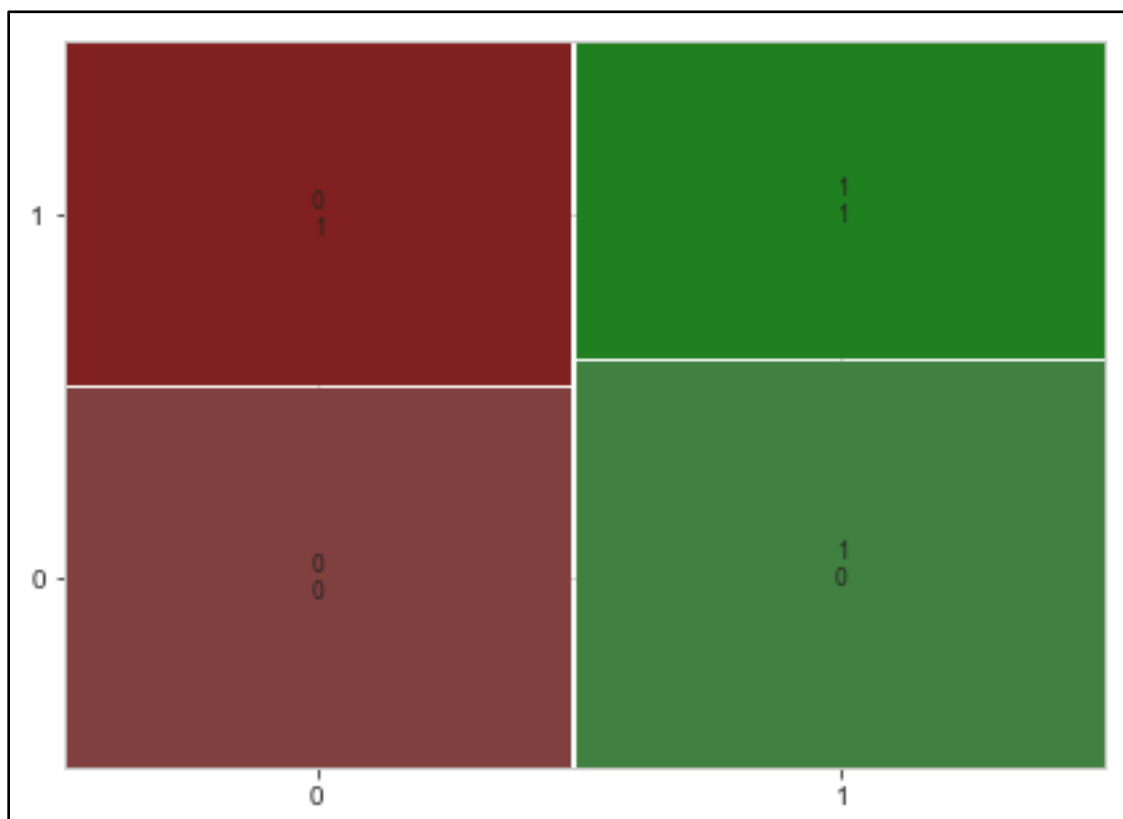
Similarly, keeping the goal to achieve in mind, more of such analysis can be performed to get a deeper understanding on the cluster of customers and concentrate on the solution to earn maximum profit.

## Step 7: Describing Segments

Segment profiling is about understanding differences in segmentation variables across market segments. For example, when conducting a data-driven market segmentation analysis using the McDonald's data set, profiling means investigating differences between segments with respect to the customer motives.

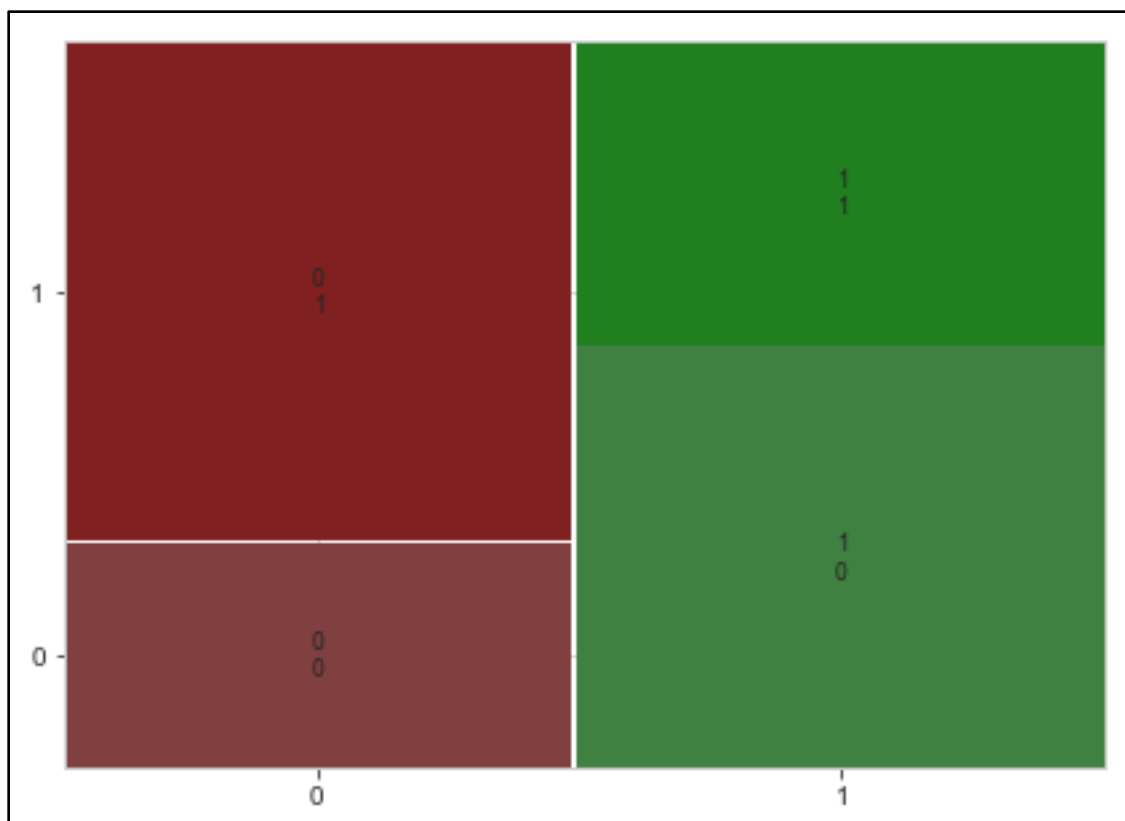
Gender: The plot below shows the concentration of gender (male or female) for both the clusters. From this we can understand that there are 372 Females for Cluster 1, 416 Females for Cluster 0, 339 Males for Cluster 1 and 326 Males for Cluster 0.

Gender	0	1
cluster_num		
0	372	339
1	416	326



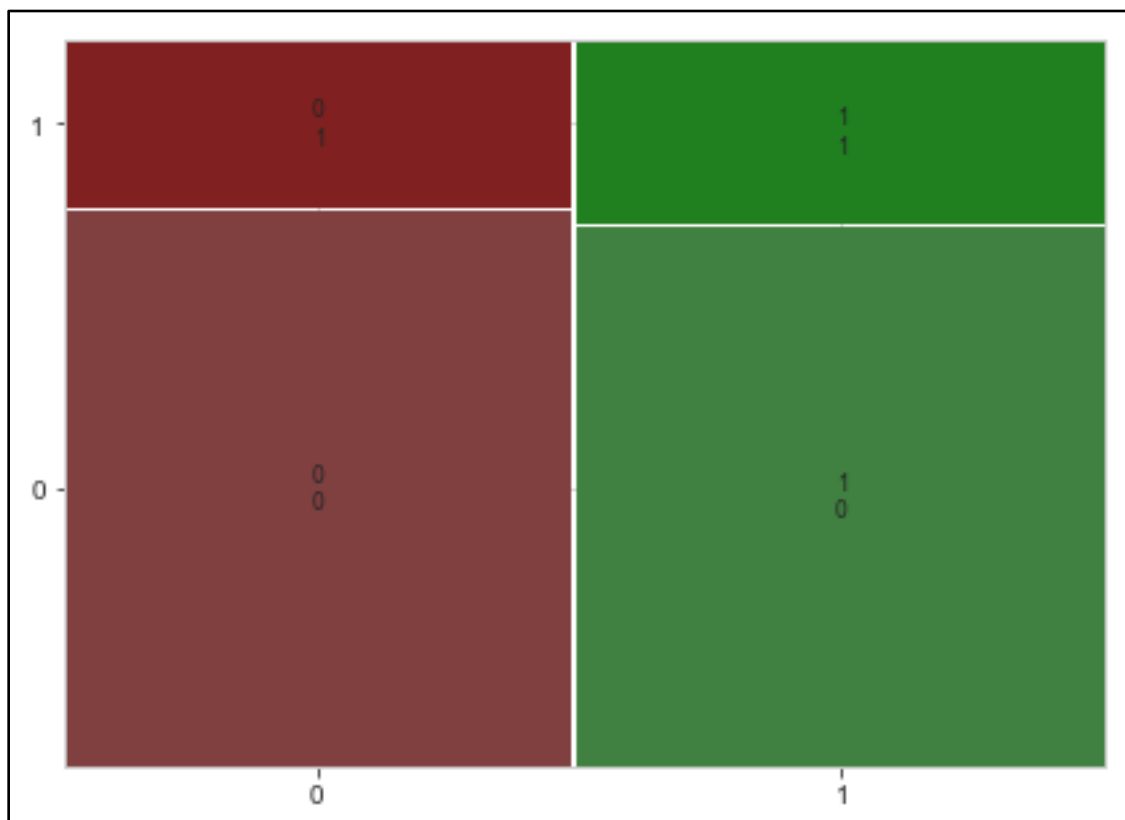
Yummy: For this feature, many of customer who found the meal to be not 'Yummy' belonged to Cluster 1, whereas the customer who found the meal to be 'Yummy' belonged to cluster 0. The rest of them either found it to be Yes or No for each cluster. This helps us to find which customers lies in which cluster and which customers actually find it 'Yummy' belong to which cluster.

yummy	0	1
cluster_num		
0	219	492
1	431	311

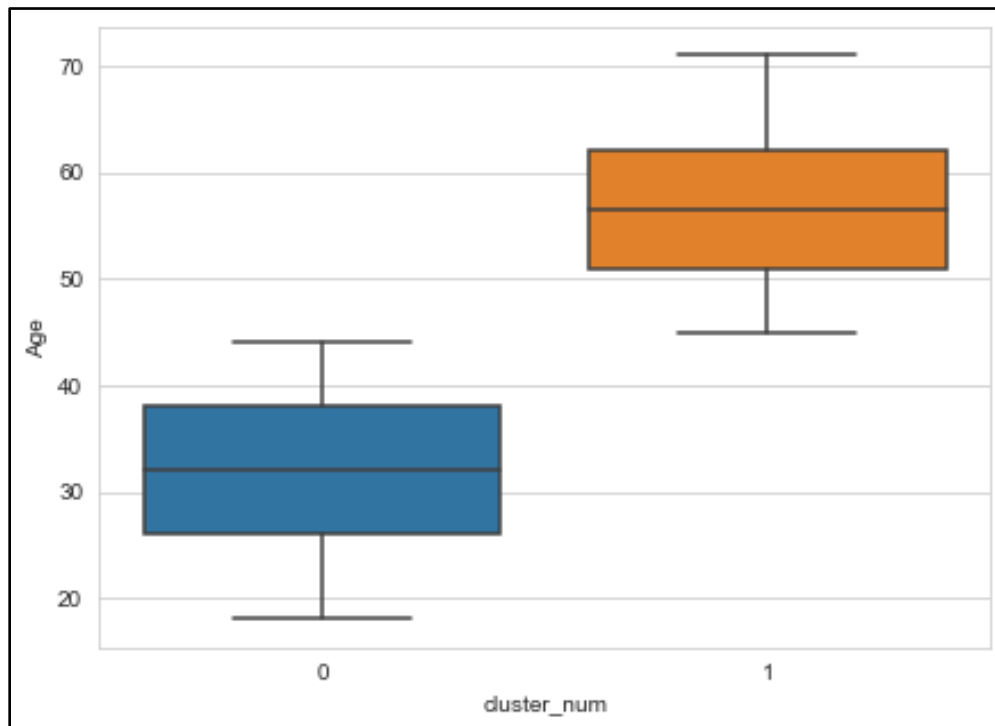


Disgusting: From the figure below, we can easily say that the customer who did not think the meal was disgusting belonged equally to both the clusters. There are few customers who think that the meal was actually disgusting and belong to each segment. However, the ratio of people actually liking the meal and not thinking it is disgusting is far more than people who disliked it. From this plot it is easy to find the cluster where people actually liked the meal and we can identify the clusters with people who did not find the meal favorable.

disgusting	0	1
cluster_num		
0	546	165
1	554	188



Cluster with respect to age: From the plot below, we can easily distinguish the age group from the clusters. The age group whose age lies between 24 to 38 belonged to cluster 0, whereas for the age group between 51 to 63 belonged to cluster 1. From this we can easily identify which age group fits perfectly to which cluster.



## Step 8: Selecting the Target Segments

The first segment to be selected is 'VisitFrequency', it helps us to understand the average visits from customers for each cluster. To summarize, we can say that the Average Visit Frequency for cluster 0 is approx. 3 and for 1 its 3.2.

VisitFrequency	
cluster_num	
0	2.957806
1	3.188679

The second segment we choose is 'Like', which tells us the feedback of each customer after each meal. From the table below we can easily identify the average like given for each cluster. For cluster 0 the average like given by each customer is approximately 1.3 and for that of cluster 1 the average like is approximately 1.

Like	
cluster_num	
0	1.255977
1	0.915094

Then we decided to choose 'Gender', which tells us which gender is heavily concentrated on which clusters. From the table below, for each cluster we have an average value of approximately 0.5, meaning there are almost equal amount of Males and Females belonging to each cluster.

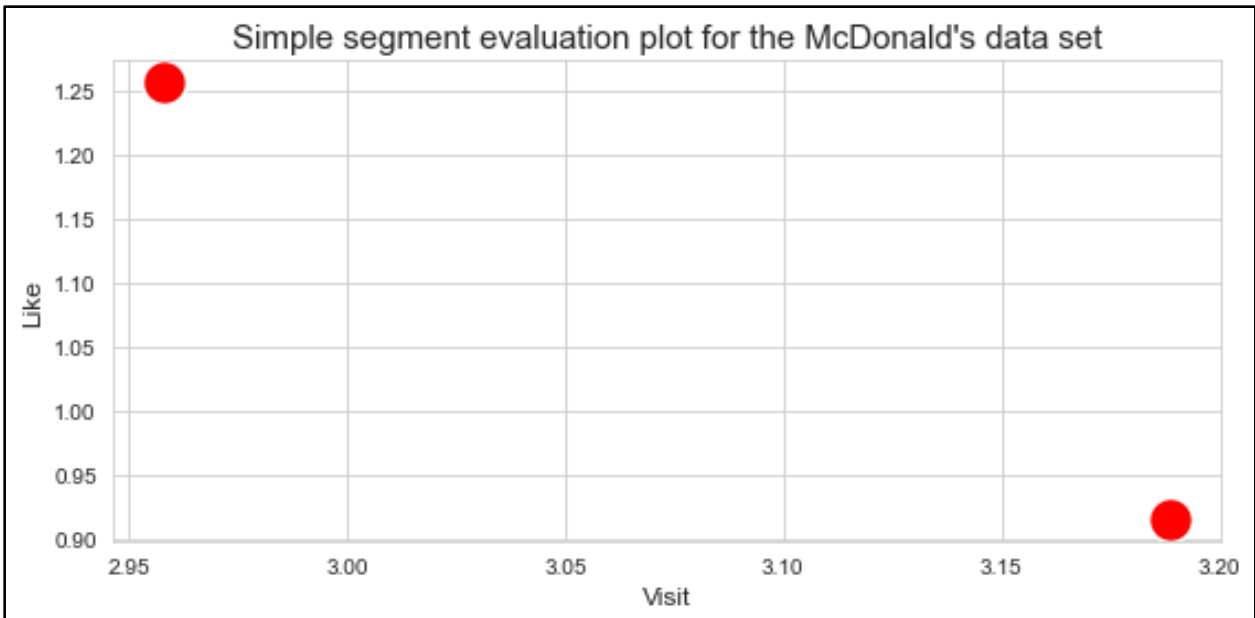
Gender	
cluster_num	
0	0.476793
1	0.439353

Lastly we combined all the features that were selected for segmentation and compare their values with respect to clusters.

Gender		Like	VisitFrequency
cluster_num			
0	0.476793	1.255977	2.957806
1	0.439353	0.915094	3.188679



On final thoughts, by looking at the plot below, we can easily recognize that people who have very few 'VisitFrequency' tends to give more likes for their meal, whereas on the other hand, customers with more 'VisitFrequency' are giving less average like for each meal.



### Step 9: Customizing the Marketing Mix

Market segmentation does not stand independently as a marketing strategy. Rather, it goes hand in hand with the other areas of strategic marketing, most importantly: positioning and competition.

The 4P's in marketing mix are:-

- ❖ **PRODUCT** - One of the key decisions an organization needs to make when developing the product dimension of the marketing mix, is to specify the product in view of customer needs. In case of McDonald's brand and business reputation are largely determined by its products, which constitute one of the four Ps. Burgers are the company's most well-known product.

- ❖ **PRICE** - The price dimension of the marketing mix include setting the price for a product, and deciding on discounts to be offered. McDonald's relies on psychological pricing methods in its marketing mix that look reasonable to customers to ensure that they buy more things. McDonald's' target market consists primarily of young teens who are brand savvy and seek convenience.
- ❖ **PLACE** - This dimension of the marketing mix involves the product be made available for purchase online or offline only or both; should the manufacturer sell directly to customers; or should a wholesaler or a retailer or both be used. McDonald's has a large number of locations in city centers and commercial malls. McDonald's operates a hybrid structure of franchised and company-owned restaurants. Customers may either visit these locations to eat or purchase items online or have them delivered to their homes. McDonald's offers customers the option of ordering food online through their website to keep up with the digital era. Customers may also order via these meal ordering applications because the firm has connected with other top food ordering providers.
- ❖ **PROMOTION** - The strategies that the company helps to convey with customers are defined by this component of the marketing mix. This variable refers to marketing communications with target consumers among the 4Ps. To entice customers to buy new items, the corporation, for example, gives fresh information. In its promotional mix, McDonald's employs the following methods, which are listed in order of importance to the company:
  - Advertisement (most significant)
  - Promotions for sales
  - Direct marketing
  - Media relations

## Step 10: Evaluation and Monitoring

A monitoring scheme is presented with two components that helps managers assess how well their segmentation strategy converts customers to the firm, meets market needs, and represents an efficient allocation of resources.

This step involves some of the key points and they are:-

1. The effectiveness of the segmentation strategy needs to be evaluated.
2. Some measures can be monitored continuously to allow ongoing assessment of the segmentation strategy.
3. Stability of Segment Membership and Segment Hopping
4. Market segments evolve over time. They may grow, decline or disappear. They change for a number of reasons.

Replication of McDonalds Case Study in Python:

- CODE FOR STEP 4

<https://github.com/gitconfig-globalusernamehimanshi/market-segmentation/tree/main>

- CODES FOR STEPS 5 AND 6

[https://github.com/bipro235/My\\_Data-science-projects/blob/main/Step-5%20and%20Step-6.ipynb](https://github.com/bipro235/My_Data-science-projects/blob/main/Step-5%20and%20Step-6.ipynb)

- CODES FOR STEP 7 AND 8

[https://github.com/Sahil-Naik/Feynn\\_Lab/blob/main/T1/source\\_code\\_final.ipynb](https://github.com/Sahil-Naik/Feynn_Lab/blob/main/T1/source_code_final.ipynb)

