Market Segmentation Summary

- **C M RITHIKA**

McDonalds_Market_Segmentation_Analysis

GitHub Respository Link - https://github.com/rithikamanjunath/rithika-feynn_intern

This case study explores market segmentation using data collected for brand image research. In this scenario, McDonald's wants to identify consumer segments with different perceptions of its brand. This understanding will guide marketing strategies.

Step 1: Decide Whether to Segment

McDonald's can choose to serve the entire market or explore differences among consumers through segmentation.

Step 2: Specify the Ideal Target Segment

McDonald's must define attractive segment characteristics, such as homogeneity, distinctiveness, size, alignment with strengths, identifiability, and reachability. In this case, liking McDonald's and frequent dining at McDonald's are key criteria due to data limitations. These criteria inform target segment selection in Step 8.

Step 3: Data Collection

1453 adult Australian consumers responded about their perceptions of McDonald's across 11 attributes (e.g., YUMMY, CONVENIENT). They answered with YES or NO. Demographic data, like AGE and GENDER, were collected. For a full market segmentation study, more information about dining behavior and information sources would be included.

Step 4: Exploring Data

First we explore the key characteristics of the data set by loading the data set and inspecting basic features such as the variable names, the sample size, and the first three rows of the data:

Exploring Data

In [5]:
```
print(mcdonalds.columns)
```

```
Index(['yummy', 'convenient', 'spicy', 'fattening', 'greasy', 'fast', 'cheap',
       'tasty', 'expensive', 'healthy', 'disgusting', 'Like', 'Age',
       'VisitFrequency', 'Gender'],
      dtype='object')
```

In [6]:
```
# Get the dimensions
num_rows, num_columns = mcdonalds.shape

print(f'Number of rows: {num_rows}')
print(f'Number of columns: {num_columns}')
```

```
Number of rows: 1453
Number of columns: 15
```

In [7]:
```
# Display the first 3 rows
print(mcdonalds.head(3))
```

```
  yummy convenient spicy fattening greasy fast cheap tasty expensive healthy  \
0    No        Yes    No       Yes     No  Yes   Yes    No       Yes      No
1   Yes        Yes    No       Yes    Yes  Yes   Yes   Yes       Yes      No
2    No        Yes   Yes       Yes    Yes  Yes    No   Yes       Yes     Yes

  disgusting Like  Age      VisitFrequency  Gender
```

Principal Component Analysis:

Principal Component Analysis, is a data reduction method that simplifies complex datasets by creating new variables called principal components. These components capture the most important information while reducing data dimensionality.

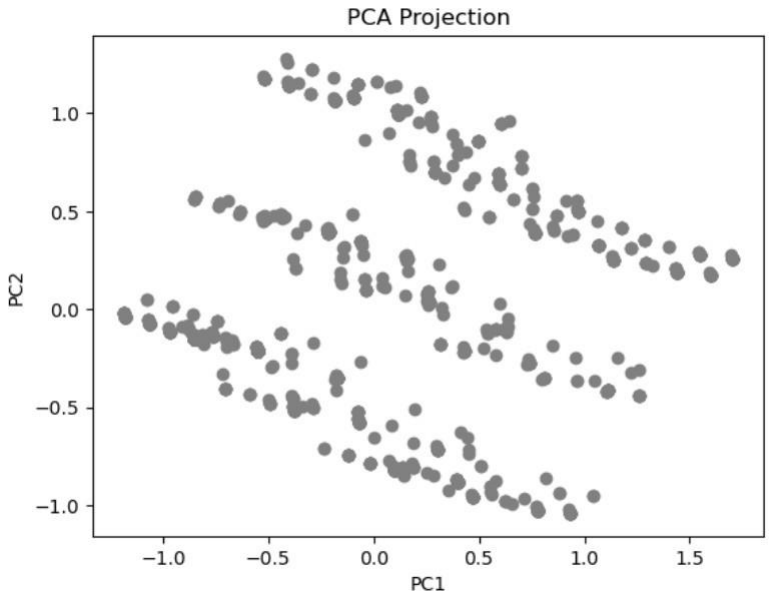
In [10]:
```
from sklearn.decomposition import PCA
# Perform PCA
pca = PCA()
MD_pca = pca.fit_transform(MD_x)
# Print summary
explained_variance = pca.explained_variance_ratio_
print("Summary:")
print(f"Standard Deviation: {pca.singular_values_}")
print(f"Proportion of Variance Explained: {explained_variance}")
print(f"Cumulative Proportion: {explained_variance.cumsum()}")
```

```
Summary:
Standard Deviation: [28.84746118 23.14716582 19.22858381 15.19626736 12.85685762 11.82305052
 11.03895052 10.48355462 10.10742431  9.48214684  9.02721076]
Proportion of Variance Explained: [0.29944723 0.19279721 0.13304535 0.08309578 0.05948052 0.05029956
 0.0438491  0.03954779 0.0367609  0.03235329 0.02932326]
Cumulative Proportion: [0.29944723 0.49224445 0.6252898  0.70838558 0.7678661  0.81816566
 0.86201476 0.90156255 0.93832345 0.97067674 1.        ]
```

In [12]:
```
import numpy as np
# Print PCA results with a specific number of digits
np.set_printoptions(precision=1)
print(MD_pca)
```

```
[[ 0.4 -0.2  0.7 ...  0.2  0.5 -0.6]
 [-0.2  0.4 -0.7 ...  0.1  0.5 -0.5]
 [ 0.4  0.7 -0.1 ... -0.3  0.1  0.2]
```

Visualization: The distribution of data points along the first two principal components (PC1 and PC2) derived from a PCA analysis. Matplotlib, a data visualization library, is imported to create the plot. After extracting PC1 and PC2 values from the PCA results, a scatter plot is generated.



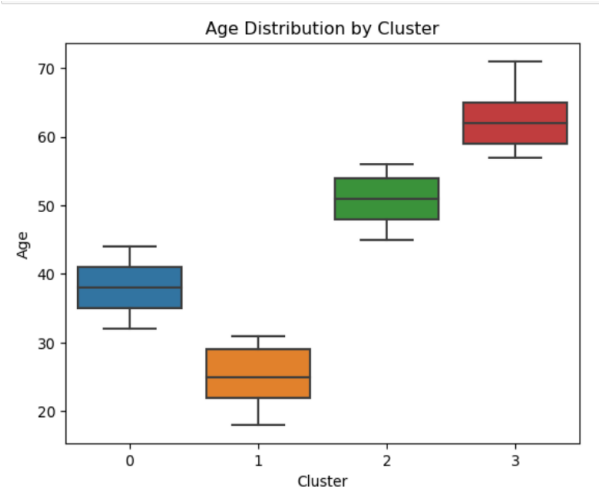
Step 5: Extracting Segments

Step 5 in market segmentation involves extracting segments using various techniques. This step is subdivided into three sections:

- Standard k-means analysis: This technique uses k-means clustering to group data points into segments.
- Finite mixtures of binary distributions: It involves using finite mixtures to model binary data distributions.
- Finite mixtures of regressions: This technique employs finite mixtures to model regressions for segment extraction.

These methods help identify distinct market segments based on data characteristics.

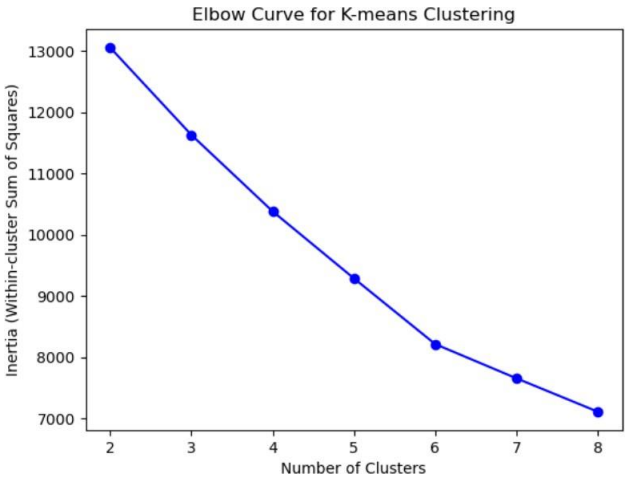
- **Using k-Means**



Boxplot to visualize 'Age' distribution within each cluster

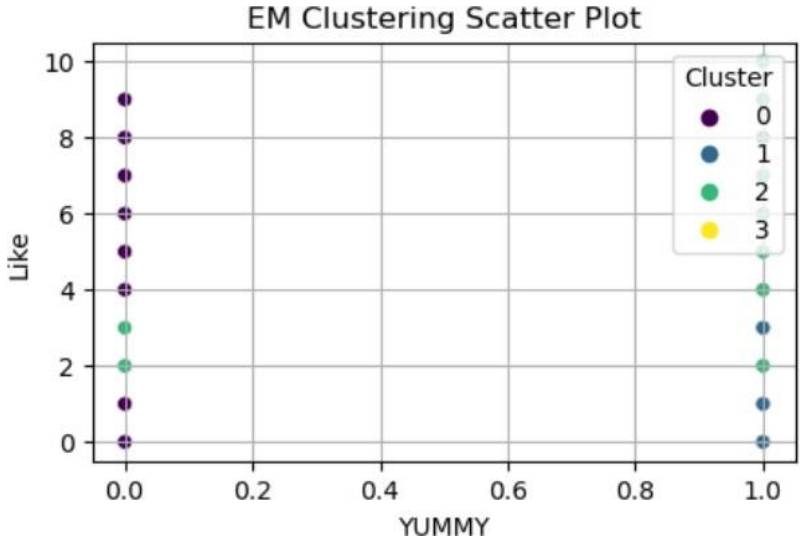
- **Using Mixtures of Distributions**

The code uses the GaussianMixture class from scikit-learn to perform finite mixture modeling for binary data distributions.



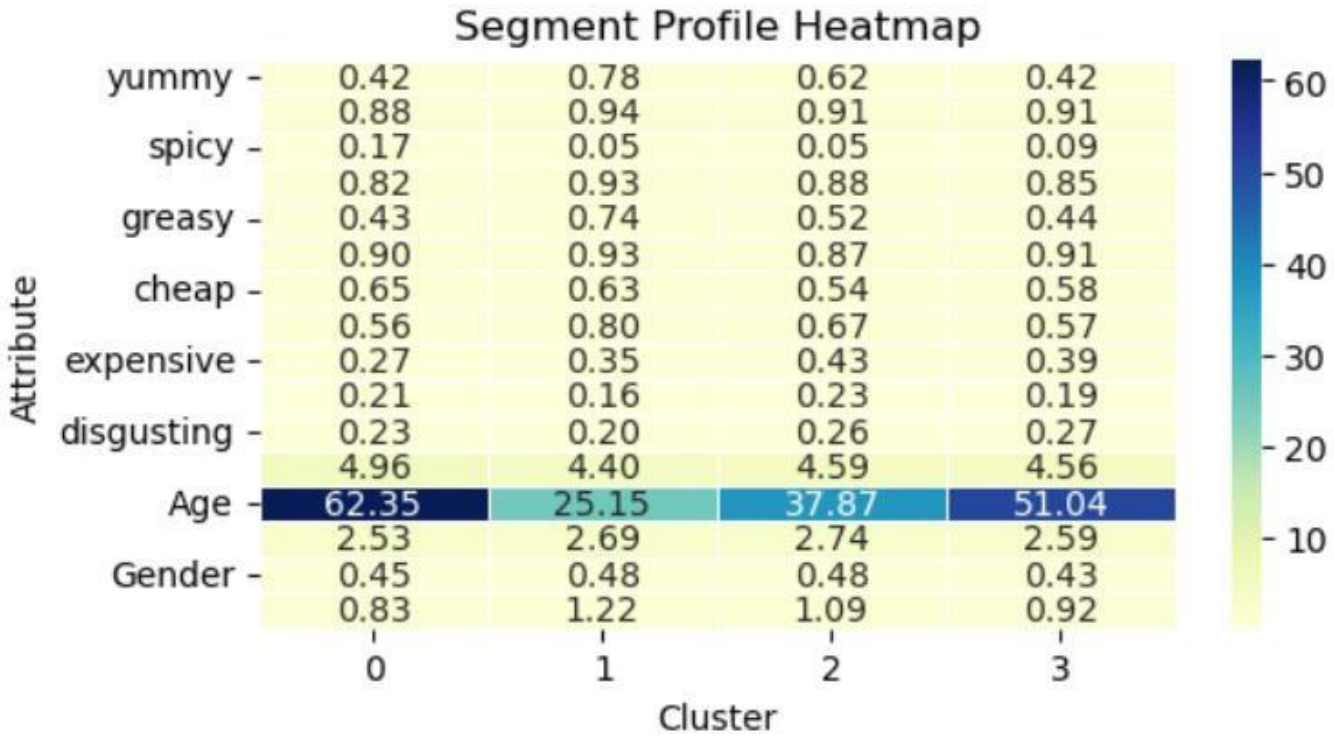
Elbow curve to determine the optimal number of clusters

- **Using Mixtures of Regression Models**



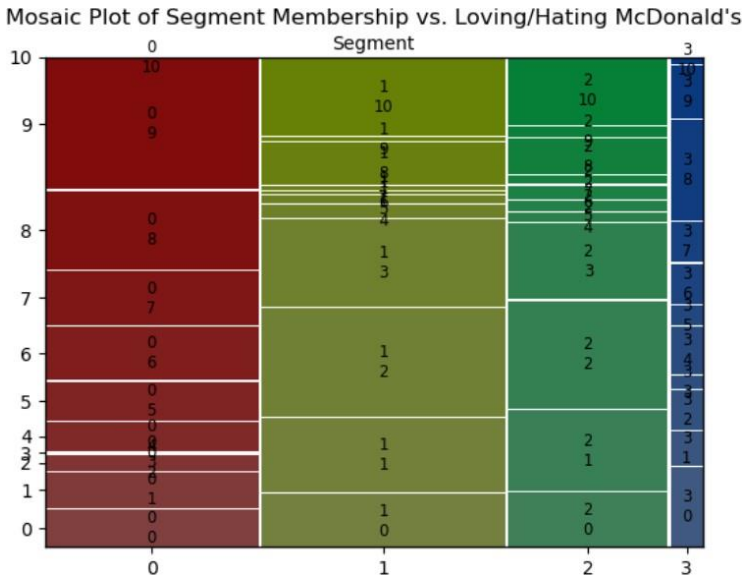
Step 6: Profiling Segments

The next step after segment extraction in the segmentation analysis is to create a segment profile plot. This plot helps in understanding the key characteristics of each market segment and highlights differences between segments.



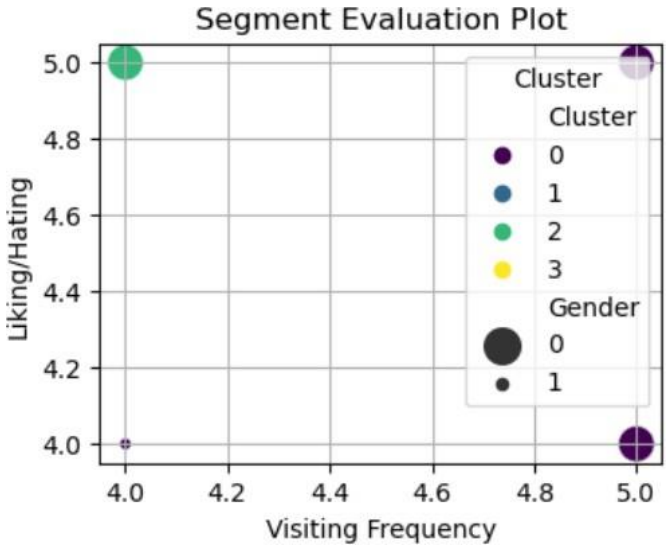
Step 7: Describing Segments

The fast food dataset lacks essential descriptor variables needed for market segmentation analysis. One available descriptor variable measures consumers' feelings towards McDonald's. A mosaic plot can illustrate the relationship between segment membership and these feelings.



Step 8: Selecting (the) Target Segment(s)

Using the knock-out criteria and segment attractiveness criteria specified ,users of the market segmentation (McDonald’s managers) can now proceed to develop a segment evaluation plot. generate code



Step 9: Customising the Marketing Mix

Here it involves designing a marketing mix tailored to a specific market segment's preferences. For example, McDonald's could target Segment 3 with a budget-friendly "MCSUPERBUDGET" product line, adjusting product features, pricing, promotion, and possibly queue management to cater to this segment's needs and gradually transition them to the regular menu as they become more financially stable.

```
Designed Product: MCSUPERBUDGET Deluxe Burger
Adjusted Price: $ 4.792000000000001
```

Step 10: Evaluation and Monitoring

After market segmentation analysis, continuous monitoring and evaluation are crucial. Changes can happen within segments and in the broader market due to factors like income growth or new competitors. McDonald's must adapt its marketing strategies as needed to respond to changing market conditions.