Clustering Analysis

## Understanding and Implementing K-Means and Hierarchical Algorithms

**Objective:**

The objective of this assignment is to introduce to various clustering algorithms, including K-Means, and hierarchical and provide hands-on experience in applying these techniques to a real-world dataset.

**Datasets:**

**Data Preprocessing:**

1. Preprocess the dataset to handle missing values, remove outliers, and scale the features if necessary.
2. Perform exploratory data analysis (EDA) to gain insights into the distribution of data and identify potential clusters.
3. Use multiple visualizations to understand the hidden patterns in the dataset

**Implementing Clustering Algorithms:**

* Implement the K-Means and hierarchical algorithms using a programming language such as Python with libraries like scikit-learn or MATLAB.
* Apply each clustering algorithm to the pre-processed dataset to identify clusters within the data.
* Experiment with different parameter settings for hierarchical clustering (e.g., linkage criteria), K-means (Elbow curve for different K values) evaluate the clustering results.

**Cluster Analysis and Interpretation:**

* Analyse the clusters generated by each clustering algorithm and interpret the characteristics of each cluster. Write you insights in few comments.