Clustering Project

Overview:

This project demonstrates the use of clustering techniques on a dataset to group similar data points. Clustering is a type of unsupervised learning that is commonly used for exploratory data analysis and can be applied to various domains such as market segmentation, social network analysis, and image recognition.

Objectives:

- To apply different clustering algorithms on a dataset.
- To visualize the clusters and understand the underlying data structure.
- To evaluate the performance and effectiveness of the clustering methods used.

Dataset:

The dataset used in this project is a synthetic dataset generated for demonstration purposes. It includes features that will be analyzed and clustered using different algorithms.

Clustering Techniques:

The project implements and compares several clustering algorithms:

1. K-Means Clustering
2. Agglomerative Hierarchical Clustering
3. DBSCAN

Methodology:

1. Data Preprocessing
2. Clustering Analysis
3. Visualization

Results:

The project provides visual and analytical insights into how different clustering algorithms perform on the dataset. Each algorithm's clusters are plotted and compared to understand the data structure and algorithmic performance.

Conclusion:

The project highlights the strengths and weaknesses of each clustering method and provides a comprehensive understanding of how to apply and evaluate clustering techniques in practical scenarios.