Task 17

Machine Learning

Upload the .py or .ipynb extension file to GitHub public repo “100DaysofBytewise" and share the link in the submission form by August 1, 2024.

Dataset : Mall Customers Dataset

1. **Implementing K-Means Clustering on Customer Segments**

Task: Apply K-Means clustering to the Mall Customers dataset to segment customers based on their annual income and spending score. Visualize the resulting clusters.

2. **Optimal Number of Clusters: Elbow Method and Silhouette Score**

Task: Use the Elbow Method and Silhouette Score to find the optimal number of clusters for the Mall Customers dataset. Discuss the criteria for selecting the number of clusters.

3. **Cluster Profiling and Insights**

Task: Analyze the characteristics of the clusters formed in the Mall Customers dataset. Provide insights into the customer segments based on their spending behavior and income levels.

4. **Hierarchical Clustering for Customer Segmentation**

Task: Implement hierarchical clustering on the Mall Customers dataset. Compare the clusters formed with those obtained from K-Means and discuss the differences.

5. **Visualizing Clusters with PCA**

Task: Apply PCA to the Mall Customers dataset to reduce its dimensionality. Visualize the clusters from both K-Means and hierarchical clustering in the PCA-reduced space.