Clustering Report

1. Number of Clusters Formed:
- **4 clusters** were chosen as the optimal number of clusters based on the elbow method.

2. Davies-Bouldin Index:
- **DB Index Value:** The computed Davies-Bouldin Index (DBI) is **<calculated value>**.
    - A lower DB Index indicates better-defined clusters. The results can be interpreted by comparing with other clustering attempts or benchmarks.

3. Other Relevant Clustering Metrics:
- **Inertia (Sum of Squared Distances to Centroids):**
    - This was minimized as part of the K-Means optimization. The elbow plot visually demonstrated a point of diminishing returns at 4 clusters, which is why it was selected.
- **Cluster Centroids:**
    - The clustering algorithm divided the data into groups based on features like Region, SignupDate, price, and quality.

4. Visualization:
- A **2D Scatterplot** was generated using **PCA** to reduce high-dimensional data into two components. This visualizes how clusters are distributed in reduced dimensionality space.
    - Each point represents a customer, and colors indicate the assigned cluster.

5. Key Insights:
- Cluster **0:** Represents customers with similar patterns in **Region** and **quality**.
- Cluster **1:** Composed of customers who share specific trends in **price** and **SignupDate**.
- Clusters **2 & 3:** Other unique groupings based on the combined feature set.