

## Report on Clustering Results :

- **Number of Clusters:** The analysis identified 5 distinct customer segments, indicating that your customer base can be meaningfully divided into five groups with different behavioral patterns.
- **Clustering Quality Metrics:**
  - DB (Davies-Bouldin) Index:** 0.8360
    - This is a relatively good score as lower DB Index values indicate better clustering (typically ranging from 0 to 1)
    - A score of 0.8360 suggests reasonably well-separated clusters with moderate intra-cluster similarity
  - Silhouette Score:** 0.3577
    - This score ranges from -1 to 1, where higher values indicate better-defined clusters
    - A score of 0.3577 indicates:
      - Clusters have some overlap but still maintain distinct characteristics
      - The clustering structure is present but moderately strong
  - Calinski-Harabasz Score:** 146.8806
    - This is a variance ratio
    - The relatively high score (146.8806) suggests good cluster separation
    - Higher values indicate better-defined clusters
- **Overall Clustering Quality Assessment:**
  - The combination of these metrics suggests a reasonable clustering solution
  - The clusters are distinct enough to be meaningful but have some overlap
  - The segmentation appears to be valid for business use, though there might be some customers who share characteristics across segments