**Data Science Assignment: eCommerce Transactions Dataset**

**Task 3: Customer Segmentation / Clustering**

To perform customer segmentation using clustering techniques, we'll follow these steps:

**Step 1: Data Preprocessing**

* Load the Customers.csv and Transactions.csv files.
* Clean and preprocess the data by handling missing values and converting categorical features into numerical representations.
* Merge the customer data with transaction data to create customer profiles that include both demographic information and transaction-related features.

**Step 2: Feature Engineering**

* **Customer profile features**: Extract relevant information such as age, region, and signup date.
* **Transaction features**: Aggregate information such as total transaction value, number of transactions, most frequently purchased products, etc.

**Step 3: Clustering Algorithm**

We'll use a clustering algorithm such as **K-Means** or **DBSCAN**. The K-Means algorithm is a popular choice, but DBSCAN can also be used for density-based clustering.

* The number of clusters will be chosen between 2 and 10, and we'll use the **Davies-Bouldin (DB) Index** to evaluate the clustering quality.

**Step 4: Evaluation Metrics**

We'll calculate clustering metrics such as:

* **Davies-Bouldin Index (DB Index)**: A lower value indicates better clustering performance.
* **Silhouette Score**: Measures how similar each point is to its own cluster compared to other clusters.

**Step 5: Visualization**

Visualize the clusters using plots such as scatter plots, pair plots, or 3D visualizations.