himanshu-lodha-clustering

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1 Task 3: Customer Segmentation / Clustering

1.1 Perform customer segmentation using clustering techniques. Use both profile information (from Customers.csv) and transaction information (from Transactions.csv).

1.1.1 You have the flexibility to choose any clustering algorithm and any number of clusters in between(2 and 10)

1.1.2 Calculate clustering metrics, including the DB Index(Evaluation will be done on this).

1.1.3 Visualise your clusters using relevant plots.

[20]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.cluster import KMeans
from sklearn.metrics import davies_bouldin_score
from sklearn.preprocessing import OneHotEncoder
```

[21]:
```
# Load the datasets
customers = pd.read_csv('Customers.csv')
transactions = pd.read_csv('Transactions.csv')
```

[23]:
```
# Prepare data for clustering
customer_features = df.groupby('CustomerID').agg({
    'TotalValue': 'sum',
    'Quantity': 'sum',
    'Region': 'first'  # Use the first region for each customer
}).reset_index()
```

[24]:
```
# One-hot encode the 'Region' column
encoder = OneHotEncoder(drop='first', sparse=False)
encoded_features = encoder.fit_transform(customer_features[['Region']])
encoded_df = pd.DataFrame(encoded_features, columns=encoder.
 ↪get_feature_names_out(['Region']))
```

[25]:

```
# Drop the original 'Region' column and concatenate the encoded features
clustering_data = customer_features.drop(columns=['CustomerID', 'Region'])
clustering_data = pd.concat([clustering_data, encoded_df], axis=1)
```

[26]:

```
# Perform KMeans clustering
kmeans = KMeans(n_clusters=5, random_state=42)
clusters = kmeans.fit_predict(clustering_data)
```

[27]:

```
# Add cluster labels to customer features
customer_features['Cluster'] = clusters
```

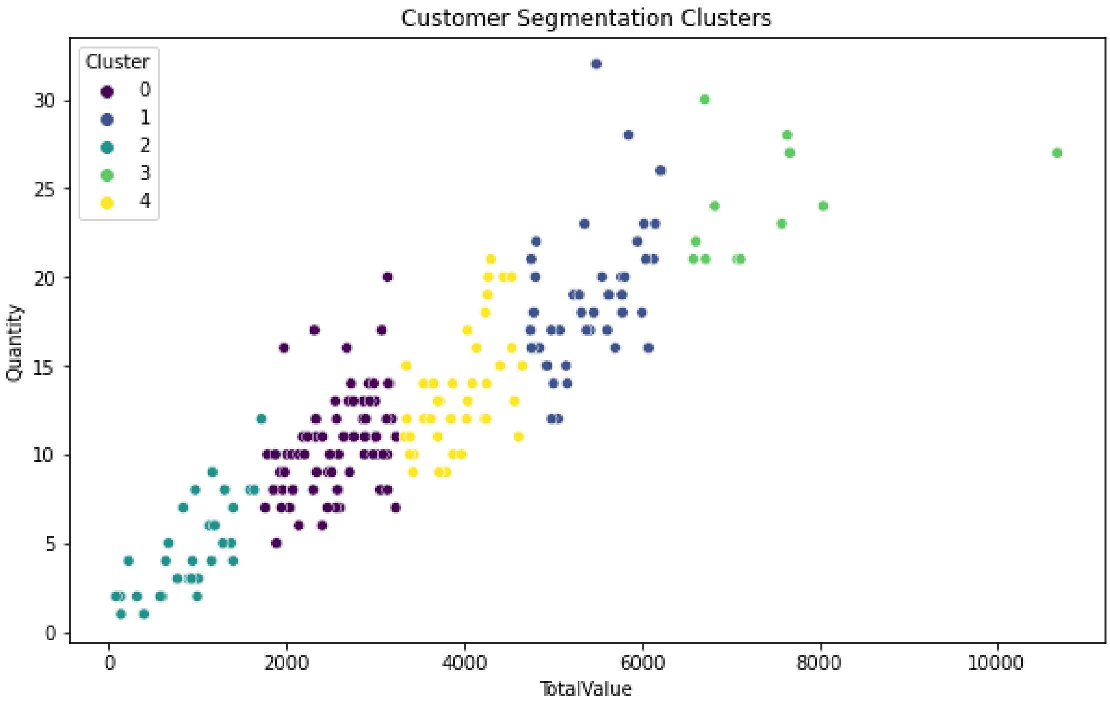
[28]:

```
# Calculate DB Index
db_index = davies_bouldin_score(clustering_data, clusters)
print(f'DB Index: {db_index}')
```

```
DB Index: 0.5253804757869114
```

[29]:

```
# Visualize clusters
plt.figure(figsize=(10, 6))
sns.scatterplot(x='TotalValue', y='Quantity', hue='Cluster',␣
 ↪data=customer_features, palette='viridis')
plt.title('Customer Segmentation Clusters')
plt.show()
```



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