```
#Import necessary packages from libraries
from sklearn.cluster import KMeans
from sklearn.preprocessing import StandardScaler
import matplotlib.pyplot as plt
import pandas as pd
import seaborn as sns


#Load the given datasets
customers = pd.read_csv('Customers.csv')
transactions = pd.read_csv('Transactions.csv')


#Merge customer profile with transaction data
customer_data = transactions.groupby('CustomerID').agg({
    'TotalValue': 'sum',
    'TransactionID': 'count'
}).reset_index()


#Standardize the data
scaler = StandardScaler()
customer_data_scaled = scaler.fit_transform(customer_data[['TotalValue', 'TransactionID']])


#Fit KMeans clustering model
kmeans = KMeans(n_clusters=4, random_state=42)
customer_data['Cluster'] = kmeans.fit_predict(customer_data_scaled)
```

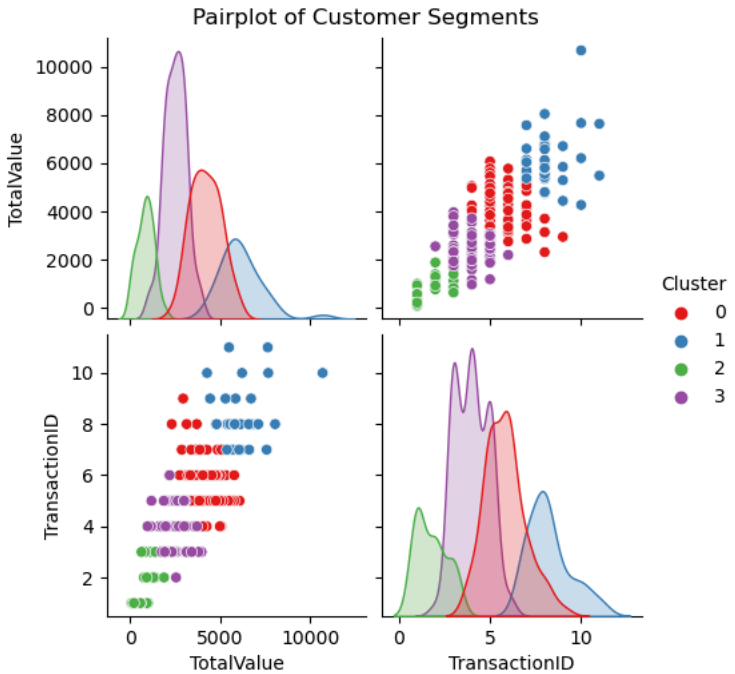
```
C:\Users\Dell\anaconda3\Lib\site-packages\sklearn\cluster\_kmeans.py:870: FutureWarning: The default value of `n_init` will change f
  warnings.warn(
C:\Users\Dell\anaconda3\Lib\site-packages\sklearn\cluster\_kmeans.py:1382: UserWarning: KMeans is known to have a memory leak on Wir
  warnings.warn(
```

```
#Calculate DB Index (Davies-Bouldin Index)
from sklearn.metrics import davies_bouldin_score
db_index = davies_bouldin_score(customer_data_scaled, customer_data['Cluster'])
print(f"DB Index: {db_index}")
```

```
DB Index: 0.8000974907901729
```

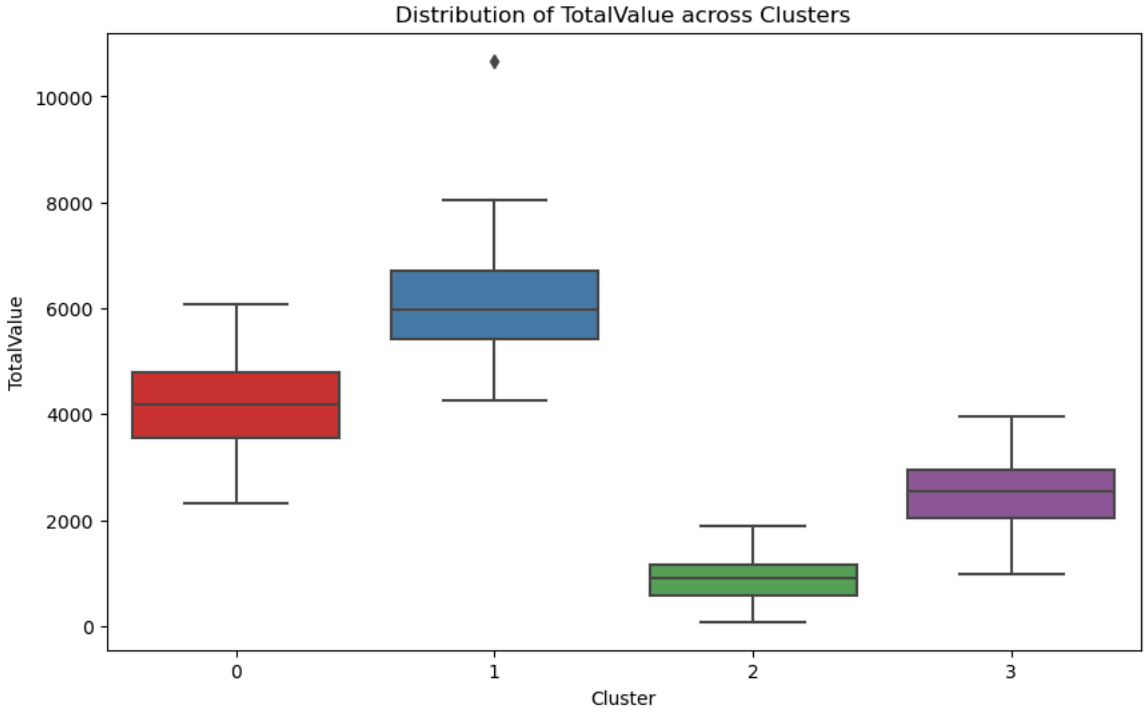
```
#Visualize pairwise relationships in TotalValue and TransactionID colored by clusters
sns.pairplot(customer_data[['TotalValue', 'TransactionID', 'Cluster']], hue='Cluster', palette='Set1')
plt.suptitle('Pairplot of Customer Segments', y=1.02)
plt.show()
```

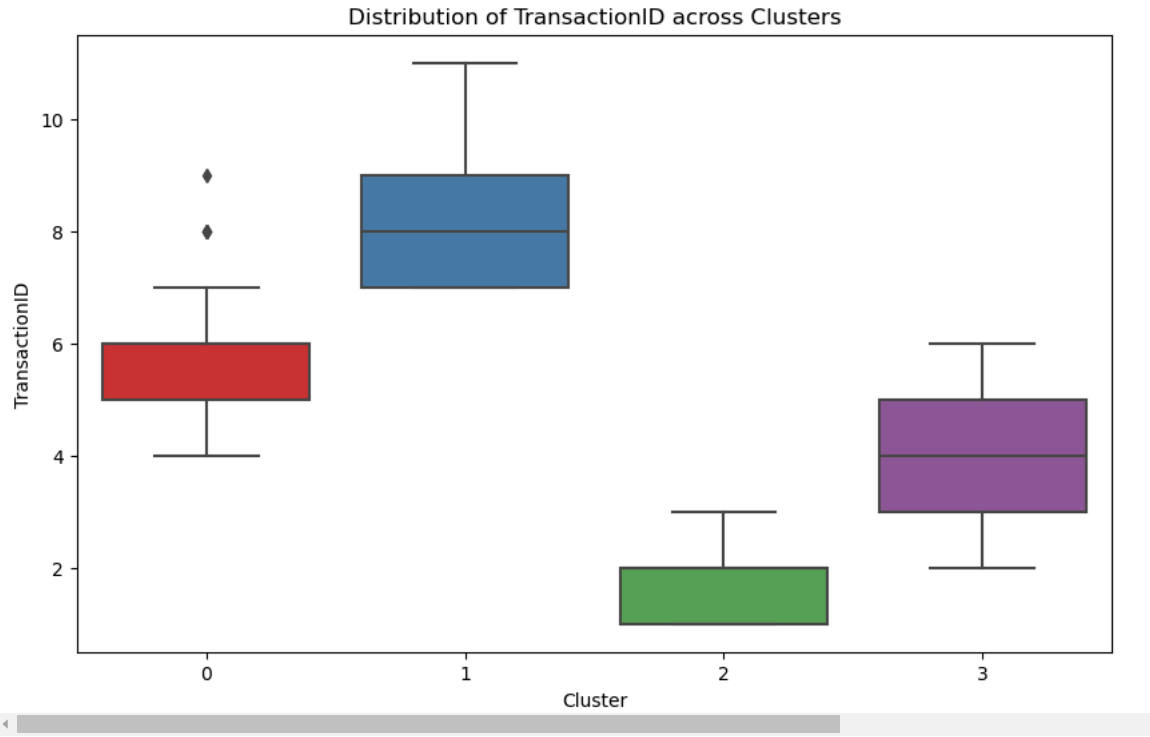
```
C:\Users\Dell\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119: FutureWarning: use_inf_as_na option is deprecated and will be re
  with pd.option_context('mode.use_inf_as_na', True):
C:\Users\Dell\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119: FutureWarning: use_inf_as_na option is deprecated and will be re
  with pd.option_context('mode.use_inf_as_na', True):
```



```
# Boxplot for TotalValue across clusters
plt.figure(figsize=(10, 6))
sns.boxplot(x='Cluster', y='TotalValue', data=customer_data, palette='Set1')
plt.title('Distribution of TotalValue across Clusters')
plt.show()

# Boxplot for TransactionID across clusters
plt.figure(figsize=(10, 6))
sns.boxplot(x='Cluster', y='TransactionID', data=customer_data, palette='Set1')
plt.title('Distribution of TransactionID across Clusters')
plt.show()
```





Start coding or generate with AI.