EXPERINMENT-35

35. Scenario: You work as a data scientist for a retail company that operates multiple stores. The company is interested in segmenting its customers based on their purchasing behavior to better understand their preferences and tailor marketing strategies accordingly. To achieve this, your team has collected transaction data from different stores, which includes customer IDs, the total amount spent in each transaction, and the frequency of visits.

Question: Your task is to build a clustering model using the K-Means algorithm to group customers into distinct segments based on their spending patterns.

Code:

```
import pandas as pd
from sklearn.cluster import KMeans
from sklearn.preprocessing import StandardScaler
import matplotlib.pyplot as plt
data = pd.read_csv("customer_transactions.csv")
X = data[["total_spent", "visit_frequency"]]
scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)
k = int(input("Enter number of clusters (k): "))
kmeans = KMeans(n_clusters=k, random_state=0)
labels = kmeans.fit_predict(X_scaled)
data["cluster"] = labels
print("\nCluster Counts:")
print(data["cluster"].value_counts())
plt.scatter(X_scaled[:, 0], X_scaled[:, 1], c=labels, cmap="tab10", s=40)
plt.xlabel("Total Spent (scaled)")
plt.ylabel("Visit Frequency (scaled)")
plt.title("Customer Segmentation using K-Means")
plt.grid(True)
plt.show()
data.to_csv("customer_segments.csv", index=False)
print("\nCustomer segments saved to customer_segments.csv")
```

Output:

```
PS C:\Users\karan\OneDrive\Desktop\New folder (2)> python 35.py
Enter number of clusters (k): 4

Cluster Counts:
cluster
3    66
1    65
2    60
0    59
Name: count, dtype: int64
```


Customer Segmentation using K-Means