

Task 3: Customer Segmentation Description: Segment customers based on tenure, monthly charges, and contract type. Analyze churn rates within these segments. Identify high-value customers who are at risk of churning and might need special attention. Skills : Segmentation techniques Understanding of customer behavior Churn analysis within segments Identifying high-value customers.

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In [1]: import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.preprocessing import StandardScaler, LabelEncoder
from sklearn.cluster import KMeans

In [2]: df=pd.read_csv('C://Users//ALWAYS RAMESH//Downloads//Telco_Customer_Churn_Dataset (

In [3]: # Convert 'Churn' column to numeric (0 = No, 1 = Yes)
df['Churn'] = df['Churn'].map({'Yes': 1, 'No': 0})

In [4]: features = ['tenure', 'MonthlyCharges']

In [5]: contract_mapping = {'Month-to-month': 0, 'One year': 1, 'Two year': 2}
df['Contract'] = df['Contract'].map(contract_mapping)

In [6]: scaler = StandardScaler()
df_scaled = scaler.fit_transform(df[features + ['Contract']])

In [7]: # Apply K-Means Clustering
kmeans = KMeans(n_clusters=3, random_state=42)
df['Segment'] = kmeans.fit_predict(df_scaled)

In [8]: # Analyze churn rate in each segment
churn_rates = df.groupby('Segment')['Churn'].mean() * 100
print("Churn Rate per Segment:\n", churn_rates)

Churn Rate per Segment:
Segment
0      6.580645
1     46.827458
2     22.441918
Name: Churn, dtype: float64

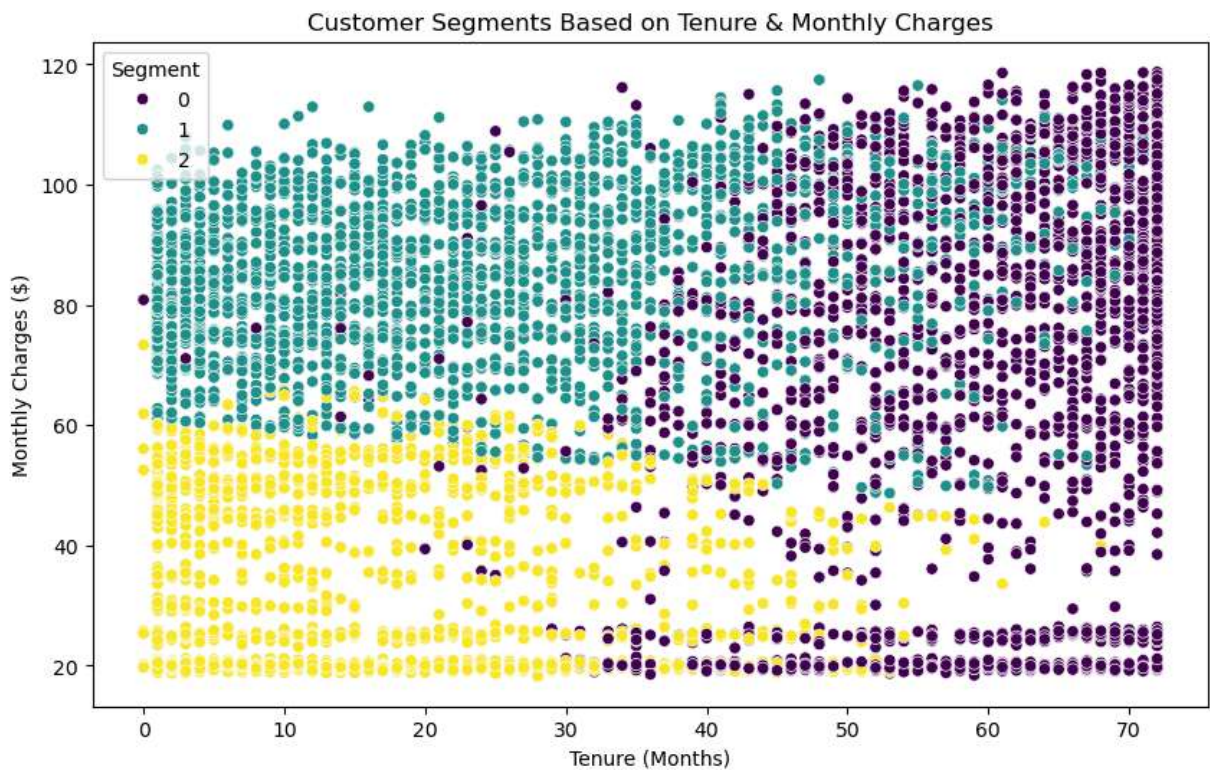
In [9]: high_value_risk = df[(df['MonthlyCharges'] > df['MonthlyCharges'].quantile(0.75)) &
print("High-Value Customers at Risk of Churning:\n", high_value_risk[['customerID',
```

High-Value Customers at Risk of Churning:

	customerID	tenure	MonthlyCharges	Contract
5	9305-CDSKC	8	99.65	0
8	7892-P00KP	28	104.80	0
13	0280-XJGEX	49	103.70	0
26	6467-CHFZW	47	99.35	0
38	5380-WJKOV	34	106.35	0
...
6972	6664-FPDAC	56	111.95	1
6986	3976-BWUCK	30	94.10	0
6991	3585-ISXZP	8	95.65	0
7006	0093-XWZFY	40	104.50	0
7034	0639-TSIQW	67	102.95	0

[578 rows x 4 columns]

```
In [10]: # Visualizing the segments
plt.figure(figsize=(10, 6))
sns.scatterplot(data=df, x='tenure', y='MonthlyCharges', hue='Segment', palette='vi
plt.title("Customer Segments Based on Tenure & Monthly Charges")
plt.xlabel("Tenure (Months)")
plt.ylabel("Monthly Charges ($)")
plt.show()
```



** Insights: This groups customers into 3 segments based on tenure, charges & contract type
Churn rates per segment highlight which groups have higher risks High-value customers at risk (paying more but likely to leave) are identified**

In []: