Assignment 8 – Unsupervised Learning (Clustering)

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Course: Applied Data Science with AI

Project Title: Customer Churn Prediction

Reflection:
This week's work helped me understand how to use clustering to find natural patterns in data. I learned how to use K-Means and visualize clusters for better understanding of customer behavior.

Task Performed:

- Practiced K-Means clustering on datasets.
- Used the Elbow Method to choose the best value of *k*.
- Created scatter plots to visualize different clusters.

Weekly Assignment Submission

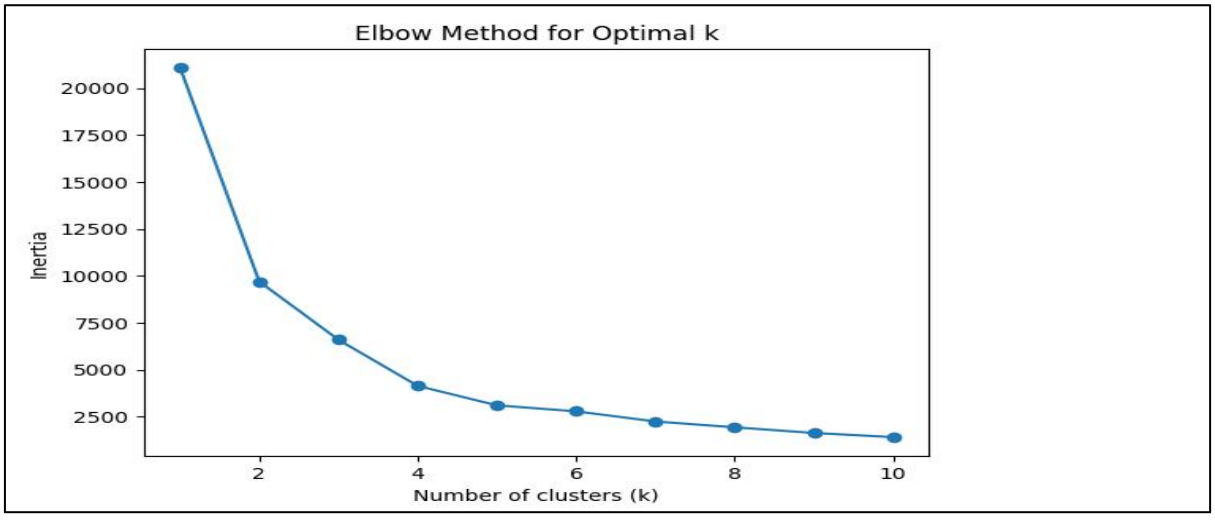
Assignment Title: Customer Segmentation using K-Means Clustering

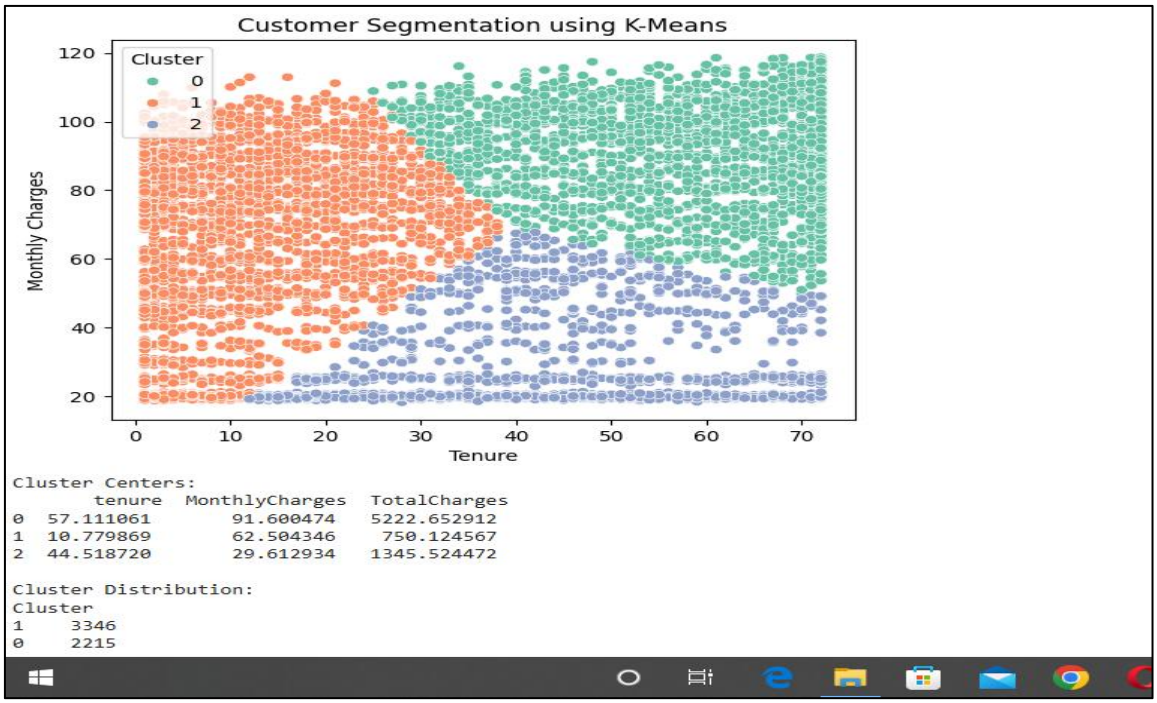
Steps Taken:

1. Loaded the cleaned Telco Customer Churn dataset.
2. Selected numerical columns for clustering.
3. Scaled the data using StandardScaler.
4. Used the Elbow Method to find the best number of clusters.
5. Applied K-Means clustering with the chosen *k*.
6. Visualized the clusters and interpreted their meaning.

Output:

Cluster	Tenure (months)	Monthly Charges ($)	Total Charges ($)	Description / Insight
Cluster 0	57.1	91.6	5222.7	Long-term customers with high monthly charges. They contribute the most revenue but may be at risk of churn due to high costs.
Cluster 1	10.8	62.5	750.1	New customers with low tenure and moderate monthly charges. They represent newly acquired users.
Cluster 2	44.5	29.6	1345.5	Mid-term customers paying low charges, likely stable and less likely to churn.





Challenges Faced:
Selecting appropriate numeric features for clustering. Solved by focusing on “tenure,” “MonthlyCharges,” and “TotalCharges.”

GitHub Link:
https://github.com/amannadeem126/Customer-Churn-Prediction

Project Progress Milestone

K-Means clustering successfully applied for customer segmentation.
Next week’s goal: Analyze and visualize final insights for the project report.