Task 8: Clustering with K-Means

- **Objective**: Perform unsupervised learning with K-Means clustering.
- **Tools**: Scikit-learn, Pandas, Matplotlib

Hints/Mini Guide:

1. Load and visualize dataset (optional PCA for 2D view).
2. Fit K-Means and assign cluster labels.
3. Use the Elbow Method to find optimal K.
4. Visualize clusters with color-coding.
5. Evaluate clustering using Silhouette Score.

Dataset: You can use any dataset relevant to the task, e.g., Mall Customer Segmentation Dataset
link to download: click here to download dataset

What You'll Learn : **Clustering, unsupervised learning, cluster evaluation.**

Interview Questions:

1. How does K-Means clustering work?
2. What is the Elbow method?
3. What are the limitations of K-Means?
4. How does initialization affect results?
5. What is inertia in K-Means?
6. What is Silhouette Score?
7. How do you choose the right number of clusters?
8. What's the difference between clustering and classification?

📤 **Submit Here:**
After completing the task, paste your GitHub repo link and submit it using the link below:
- 👉 [Submission Link]

📌 **Task Submission Guidelines**

- ⏰ **Time Window:**

You can complete the task anytime between 10:00 AM to 10:00 PM on the given day. Submission link closes at 10 :00 PM

- 🔍 **Self-Research Allowed:**

You are free to explore, Google, or refer to tutorials to understand concepts and complete the task effectively.

- 🛠️ **Debug Yourself:**

Try to resolve all errors by yourself. This helps you learn problem-solving and ensures you don't face the same issues in future tasks.

- 💸 **No Paid Tools:**

If the task involves any paid software/tools, do not purchase anything. Just learn the process or find free alternatives.

- 📁 **GitHub Submission:**

Create a new GitHub repository for each task.

Add everything you used for the task — code, datasets, screenshots (if any), and a **short README.md** explaining what you did.

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