CAPSTONE PROJECT

`Capstone Project`

Customer Segmentation using Unsupervised Machine Learning

Assignment Overview

In this assignment, you will apply **Descriptive Data Mining** to perform **customer segmentation** on mall customer data. You will explore clustering techniques:

- **K-Means Clustering**

Objectives

By completing this assignment, you will:

1. Perform **Exploratory Data Analysis (EDA)** to understand the dataset.
2. **Preprocess and wrangle** the data to prepare it for clustering.
3. Implement **K-Means on the dataset.**

Dataset Description

You will use a dataset containing information about mall customers, including attributes such as:

- **Customer ID** (Unique identifier)
- **Gender** (Male/Female)
- **Age** (Customer's age)
- **Annual Income** (in thousands of dollars)
- **Spending Score** (Assigned based on cusm an ierarchical cstering.
- Fine-tune hyperparameters in DBSCAN to achieve better clustering.

Good luck! 🚀

📚 Assignment (2): Customer Churn Prediction

🎯 Objectives:

Use a classification model to predict customer churn based on a simplified dataset containing age, tenure, and gender.

📝 Instructions:

1. **Load the Dataset**
   Download and load `churn_dataset_with_tenure.xlsx`.
2. **Preprocess the Data**
   - Convert the categorical column `Sex` to numeric using `.map({'Male': 1, 'Female': 0})`
   - Convert the target column `Churn` using `.map({'No': 0, 'Yes': 1})`
   - Check for missing values.
3. **Train a Classification Model**
   - Use a simple model like `NaiveBayes.
   - Split the dataset using `train_test_split()`.
4. **Evaluate the Model**
   - Use `accuracy_score` to evaluate performance.
   - Optionally show confusion matrix.(Bonus)
5. **(Bonus 🎁) Build a Streamlit App** Build a small web app that:
   - Takes user input (Age, Tenure, and Gender)
   - Predicts whether the customer will churn
   - Shows the prediction and probability