**Lab 10**

**Question 1: Load and Explore the Dataset**

1. **Load the data**:
   * Use sklearn.datasets.load\_wine to load the Wine dataset.
   * Create a DataFrame for the features and a Series for the target variable.
2. **Inspect the dataset**:
   * Display basic statistics (mean, median, standard deviation).
   * Check for missing values.
   * Print the first 5 rows of the dataset.

**Question 2: Data Preprocessing**

1. **Split the data**:
   * Divide the dataset into training and testing sets using train\_test\_split.
   * Split the dataset with 70% training data and 30% testing data.
   * Print the shape of the training and test sets.

**Question 3: Data Visualization**

1. **Class distribution**:
   * Visualize the distribution of target classes using a bar plot.
2. **Feature relationships**:
   * Select two features and create a scatter plot to visualize the relationship between them, with points colored by class.
3. **Pairplot**:
   * Use seaborn.pairplot to visualize relationships for 4-5 features of your choice.

**Part 4: k-Nearest Neighbors Classification**

1. **Train a k-NN model**:
   * Use the scaled and split data.
   * Use KNeighborsClassifier from sklearn.
2. **Evaluate the model**:
   * Predict the target classes for the test set.
   * Evaluate the model using accuracy, confusion matrix, and classification

**Deliverables :**Submit a Jupyter Notebook