

AI Lab\Exp_13\KNN.py

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1 from sklearn.datasets import load_iris
2 from sklearn.model_selection import train_test_split
3 from sklearn.preprocessing import StandardScaler
4 from sklearn.neighbors import KNeighborsClassifier
5 from sklearn.metrics import accuracy_score, confusion_matrix
6
7 # 1. Load the dataset
8 iris = load_iris()
9 X, y = iris.data, iris.target
10
11 # 2. Split the dataset
12 # Splitting into training (70%) and testing (30%) sets
13 X_train, X_test, y_train, y_test = train_test_split(
14     X, y, test_size=0.3, random_state=42
15 )
16
17 # 3. Scale features (Standardization)
18 # This ensures all features contribute equally to the distance calculation
19 scaler = StandardScaler()
20 X_train = scaler.fit_transform(X_train)
21 X_test = scaler.transform(X_test)
22
23 # 4. Initialize and Train the KNN Classifier
24 # Using K=3 neighbors
25 knn = KNeighborsClassifier(n_neighbors=3)
26 knn.fit(X_train, y_train)
27
28 # 5. Make predictions on test data
29 y_pred = knn.predict(X_test)
30
31 # 6. Evaluate performance
32 print("Accuracy:", accuracy_score(y_test, y_pred))
33 print("\nConfusion Matrix:\n", confusion_matrix(y_test, y_pred))
```