

Experiment-4 (a)

Aim:

Understand and apply regression algorithm.

Code:

```
1 import pandas as pd
2 import matplotlib.pyplot as plt
3 import seaborn as sns
4 from sklearn.datasets import load_iris
5 from sklearn.model_selection import train_test_split
6 from sklearn.linear_model import LinearRegression
7 from sklearn.metrics import mean_squared_error, r2_score,
  ↪ mean_absolute_error
8
9 # Load Iris dataset correctly
10 iris = load_iris(as_frame=True)
11 df = iris.frame
12
13 # Check actual column names
14 print("Columns in dataset:", df.columns.tolist())
15 print("\nFirst 5 rows:")
16 print(df.head())
17
18 # Correct column names
19 X = df[['petal length (cm)']]
20 y = df['petal width (cm)']
21
22 # Split data
23 X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,
  ↪ random_state=42)
24
25 # Train model
26 model = LinearRegression()
27 model.fit(X_train, y_train)
28
29 # Predict
30 y_pred = model.predict(X_test)
31
32 # Results
33 print("\n" + "="*60)
34 print("LINEAR REGRESSION: petal length → petal width")
35 print("="*60)
36 print(f"Slope: {model.coef_[0]:.4f}")
37 print(f"Intercept: {model.intercept_:.4f}")
38 print(f"R2 Score: {r2_score(y_test, y_pred):.4f}")
39
```