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1  # Import the necessary libraries
2  import pandas as pd
3  import numpy as np
4  from sklearn.preprocessing import StandardScaler
5  from sklearn.model_selection import train_test_split
6  from sklearn.metrics import mean_squared_error, r2_score
7  from sklearn.linear_model import LinearRegression
8  from sklearn.ensemble import RandomForestRegressor
9  from sklearn.svm import SVR
10 from sklearn.neural_network import MLPRegressor
11
12 # Load the dataset
13 data = pd.read_csv('data.csv')
14
15 # Split the data into features and target variable
16 X = data[['feature1', 'feature2', 'feature3']]
17 y = data['target']
18
19 # Split the data into training and testing sets
20 X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
21
22 # Standardize the features
23 scaler = StandardScaler()
24 X_train = scaler.fit_transform(X_train)
25 X_test = scaler.transform(X_test)
26
27 # Train the Linear Regression model
28 lr = LinearRegression()
29 lr.fit(X_train, y_train)
30
31 # Predict using the Linear Regression model
32 y_pred_lr = lr.predict(X_test)
33
34 # Calculate the Mean Squared Error (MSE) and R-squared score for Linear Regression
35 mse_lr = mean_squared_error(y_test, y_pred_lr)
36 r2_lr = r2_score(y_test, y_pred_lr)
37
38 # Train the Random Forest model
39 rf = RandomForestRegressor()
40 rf.fit(X_train, y_train)
41
42 # Predict using the Random Forest model
43 y_pred_rf = rf.predict(X_test)
44
45 # Calculate the Mean Squared Error (MSE) and R-squared score for Random Forest
46 mse_rf = mean_squared_error(y_test, y_pred_rf)
47 r2_rf = r2_score(y_test, y_pred_rf)
48
49 # Train the Support Vector Regression (SVR) model
50 svr = SVR()
51 svr.fit(X_train, y_train)
52
53 # Predict using the SVR model
54 y_pred_svr = svr.predict(X_test)
55
56 # Calculate the Mean Squared Error (MSE) and R-squared score for SVR
57 mse_svr = mean_squared_error(y_test, y_pred_svr)
58 r2_svr = r2_score(y_test, y_pred_svr)
59
60 # Train the Multi-Layer Perceptron (MLP) model
61 mlp = MLPRegressor()
62 mlp.fit(X_train, y_train)
63
64 # Predict using the MLP model
65 y_pred_mlp = mlp.predict(X_test)
66
67 # Calculate the Mean Squared Error (MSE) and R-squared score for MLP
68 mse_mlp = mean_squared_error(y_test, y_pred_mlp)
69 r2_mlp = r2_score(y_test, y_pred_mlp)
70
71 # Print the results
72 print("Linear Regression Results:")
73 print("MSE: ", mse_lr)
74 print("R-squared: ", r2_lr)
75
76 print("Random Forest Results:")
77 print("MSE: ", mse_rf)
78 print("R-squared: ", r2_rf)
79
80 print("SVR Results:")
81 print("MSE: ", mse_svr)
82 print("R-squared: ", r2_svr)
83
84 print("MLP Results:")
85 print("MSE: ", mse_mlp)
86 print("R-squared: ", r2_mlp)

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