NAME: SOHAN KATAGERI

ROLL NO: 25

PRACTICAL: 5

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import pandas as pd
from sklearn.datasets import load_breast_cancer
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean_squared_error, r2_score

# Load the Breast Cancer dataset
breast_cancer = load_breast_cancer()
X = pd.DataFrame(breast_cancer.data,
columns=breast_cancer.feature_names)
y = breast_cancer.target

# Split the data into training and testing sets (80% training, 20%
testing)
X_train, X_test, y_train, y_test = train_test_split(X, y,
test_size=0.2, random_state=42)

# Instantiate the Linear Regression model
model = LinearRegression()

# Train the model on the training set
model.fit(X_train, y_train)

# Make predictions on the testing set
y_pred = model.predict(X_test)

# Evaluate the model
mse = mean_squared_error(y_test, y_pred)
r2 = r2_score(y_test, y_pred)

# Display the evaluation metrics
print("Breast Cancer Dataset:")
print(f"Mean Squared Error (MSE): {mse:.4f}")
print(f"R-squared (R2): {r2:.4f}")

# Display the coefficients for each feature
coefficients = pd.DataFrame({'Feature': X.columns, 'Coefficient':
model.coef_})
```

```
print("\nCoefficients:")
print(coefficients)
```

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Breast Cancer Dataset:
Mean Squared Error (MSE): 0.0641
R-squared (R2): 0.7271

Coefficients:
```

	Feature	Coefficient
0	mean radius	0.197130
1	mean texture	-0.002795
2	mean perimeter	-0.022776
3	mean area	-0.000329
4	mean smoothness	0.411490
5	mean compactness	5.001712
6	mean concavity	-1.005870
7	mean concave points	-4.915704
8	mean symmetry	0.338394
9	mean fractal dimension	-5.814256
10	radius error	-0.432262
11	texture error	0.012633
12	perimeter error	0.008247
13	area error	0.001245
14	smoothness error	-18.078509
15	compactness error	2.207987
16	concavity error	4.273759
17	concave points error	-18.158953
18	symmetry error	1.194494
19	fractal dimension error	3.012037
20	worst radius	-0.214439
21	worst texture	-0.009617
22	worst perimeter	0.008712
23	worst area	0.000961
24	worst smoothness	-0.132385
25	worst compactness	-0.762670
26	worst concavity	-0.615743
27	worst concave points	1.326198
28	worst symmetry	-1.021132
29	worst fractal dimension	-1.273638