# Linear Regression

## Program:

```
import numpy as np
import matplotlib.pyplot as plt
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean_squared_error, r2_score
X = np.array([1, 2, 3, 4, 5]).reshape(-1, 1)  # Independent variable
y = np.array([2.2, 2.8, 3.6, 4.5, 5.1])      # Dependent variable

model = LinearRegression()
model.fit(X, y)
y_pred = model.predict(X)

mse = mean_squared_error(y, y_pred)
r2 = r2_score(y, y_pred)

print(f"Coefficient (Slope): {model.coef_[0]:.2f}")
print(f"Intercept: {model.intercept_:.2f}")
print(f"Mean Squared Error: {mse:.2f}")
print(f"R^2 Score: {r2:.2f}")
plt.scatter(X, y, color='blue', label='Actual Data')
plt.plot(X, y_pred, color='red', label='Regression Line')
plt.title('Simple Linear Regression')
plt.xlabel('X')
plt.ylabel('y')
plt.legend()
plt.show()
```

## Output:

```
Coefficient (Slope): 0.75
Intercept: 1.39
Mean Squared Error: 0.01
R^2 Score: 1.00
```