import pandas as pd

import matplotlib.pyplot as plt

from sklearn.model\_selection import train\_test\_split

from sklearn.linear\_model import LinearRegression

from sklearn.metrics import mean\_squared\_error, r2\_score

data = {

    'House\_Size': [1000, 1500, 1800, 2400, 3000, 3500, 4000, 4200, 5000, 6000],

    'Price': [150000, 200000, 250000, 300000, 400000, 450000, 480000, 500000, 600000, 700000]

}

df = pd.DataFrame(data)

plt.scatter(df['House\_Size'], df['Price'], color='blue')

plt.xlabel("House Size (sq ft)")

plt.ylabel("Price ($)")

plt.title("Bivariate Analysis: House Size vs Price")

plt.show()

X = df[['House\_Size']]

y = df['Price']

X\_train, X\_test, y\_train, y\_test = train\_test\_split(X, y, test\_size=0.2, random\_state=42)

model = LinearRegression()

model.fit(X\_train, y\_train)

y\_pred = model.predict(X\_test)

plt.scatter(X\_train, y\_train, color='blue', label="Training data")

plt.scatter(X\_test, y\_test, color='green', label="Test data")

plt.plot(X\_test, y\_pred, color='red', linewidth=2, label="Regression Line")

plt.xlabel("House Size (sq ft)")

plt.ylabel("Price ($)")

plt.title("Linear Regression: House Size vs Price")

plt.legend()

plt.show()

mse = mean\_squared\_error(y\_test, y\_pred)

r2 = r2\_score(y\_test, y\_pred)

print("\n📊 Model Evaluation Metrics:")

print(f"Mean Squared Error (MSE): {mse:.2f}")

print(f"R-squared (R² Score): {r2:.4f}")

new\_size = float(input("\nEnter house size (sq ft) to predict price: "))

predicted\_price = model.predict([[new\_size]])[0]

print(f"💰 Predicted Price for {new\_size:.0f} sq ft house: ${predicted\_price:,.2f}")

OUTPUT:

Model Evaluation Metrics:

Mean Squared Error (MSE): 110472088.14

R-squared (R² Score): 0.9972

Enter house size (sq ft) to predict price: 1500

C:\Users\dadak\AppData\Local\Packages\PythonSoftwareFoundation.Python.3.13\_qbz5n2kfra8p0\LocalCache\local-packages\Python313\site-packages\sklearn\utils\validation.py:2749: UserWarning: X does not have valid feature names, but LinearRegression was fitted with feature names

warnings.warn(

💰 Predicted Price for 1500 sq ft house: $214,296.09



