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import numpy as np

import pandas as pd

import matplotlib.pyplot as plt

from sklearn.linear_model import LinearRegression

from sklearn.metrics import mean_squared_error, r2_score


# -----

# Sample Dataset

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# Let's create a simple dataset

data = {

    'Experience': [1, 2, 3, 4, 5, 6, 7, 8, 9, 10],    # Independent variable (X1)

    'Education_Level': [2, 3, 3, 4, 4, 5, 5, 6, 6, 7], # Independent variable (X2)

    'Salary': [30, 35, 40, 45, 50, 58, 60, 65, 70, 75] # Dependent variable (Y)

}


df = pd.DataFrame(data)


# -----

# 1. Simple Linear Regression (Experience vs Salary)

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X_simple = df[['Experience']] # Independent variable

y = df['Salary']             # Dependent variable


model_simple = LinearRegression()

model_simple.fit(X_simple, y)


y_pred_simple = model_simple.predict(X_simple)

```

```
print("Simple Linear Regression:")
print(f"Intercept: {model_simple.intercept_}")
print(f"Coefficient: {model_simple.coef_[0]}")
print(f"R2 Score: {r2_score(y, y_pred_simple)}")
print("-" * 40)
```

```
# Plotting
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```
plt.figure(figsize=(8, 4))
plt.scatter(df['Experience'], y, color='blue', label='Actual')
plt.plot(df['Experience'], y_pred_simple, color='red', label='Predicted')
plt.title('Simple Linear Regression (Experience vs Salary)')
plt.xlabel('Experience (Years)')
plt.ylabel('Salary')
plt.legend()
plt.show()
```

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# 2. Multiple Linear Regression (Experience + Education Level vs Salary)
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```
X_multiple = df[['Experience', 'Education_Level']]
```

```
model_multiple = LinearRegression()
```

```
model_multiple.fit(X_multiple, y)
```

```
y_pred_multiple = model_multiple.predict(X_multiple)
```

```
print("Multiple Linear Regression:")
```

```
print(f"Intercept: {model_multiple.intercept_}")  
print(f"Coefficients: {model_multiple.coef_}")  
print(f"R2 Score: {r2_score(y, y_pred_multiple)}")  
print("-" * 40)
```