

```
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
# -----
# 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)
# -----
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
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()

# -----
# 2. Multiple Linear Regression (Experience + Education Level vs Salary)
# -----
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)
```