Practical 12

Demonstration of Linear regression in MS – Excel / using python program

```
import numpy as np
import matplotlib.pyplot as plt
# Sample data
x = np.array([1, 2, 3, 4, 5])
y = np.array([2, 4, 5, 4, 5])
# Calculate mean and standard deviation
x_mean = np.mean(x)
y_mean = np.mean(y)
x_std = np.std(x)
y_std = np.std(y)
# Calculate covariance and slope
covariance = np.sum((x - x_mean) * (y - y_mean)) / (len(x) - 1)
slope = covariance / (x_std**2)
# Calculate y-intercept (b)
intercept = y_mean - slope * x_mean
# Predicted values
y_pred = slope * x + intercept
# Plot data and regression line
plt.scatter(x, y)
plt.plot(x, y_pred, color='red')
# Add labels and title
plt.xlabel('x')
plt.ylabel('y')
plt.title('Simple Linear Regression')
# Show the plot
```

```
plt.show()
# Print slope and intercept
print(f"Slope: {slope:.2f}")
print(f"Intercept: {intercept:.2f}")
```