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**ROLL NO:24**

**BATCH : B2**

**COURSE: ML PRACTICAL**

**Assginment No. 3**

**Problem Statement :**

**Implement linear regression on Data set**

**Code :**

***import numpy as np***

***import matplotlib.pyplot as plt***

***# Define the data directly***

***hours = np.array([10, 9, 2, 15, 10, 16, 11, 16])***

***risk\_scores = np.array([95, 80, 10, 50, 45, 98, 38, 93])***

***# Calculate the means***

***mean\_x = np.mean(hours)***

***mean\_y = np.mean(risk\_scores)***

***# Calculate the slope (m) and intercept (b)***

***numerator = np.sum((hours - mean\_x) \* (risk\_scores - mean\_y))***

***denominator = np.sum((hours - mean\_x) \*\* 2)***

***m = numerator / denominator***

***b = mean\_y - m \* mean\_x***

***# Print the slope and intercept***

***print(f"Slope (m): {m}")***

***print(f"Intercept (b): {b}")***

***# Define the best fit line***

***def predict(x):***

***return m \* x + b***

***# Predict the risk score for 20 hours***

***hours\_to\_predict = 20***

***predicted\_risk = predict(hours\_to\_predict)***

***print(f"Predicted risk score for {hours\_to\_predict} hours: {predicted\_risk}")***

***# Plot the data and the best fit line***

***plt.scatter(hours, risk\_scores, color='blue', label='Data Points')***

***plt.plot(hours, predict(hours), color='red', label='Best Fit Line')***

***plt.xlabel('Hours Spent Driving')***

***plt.ylabel('Risk Score')***

***plt.title('Linear Regression')***

***plt.legend()***

***plt.grid(True)***

***plt.show()***

**Output :**

