**ML EXPERIMENT 3**

X = [1, 2, 3, 4, 5]

y = [2, 3.5, 2.8, 4.6, 5.0]

# Calculating the mean of X and y

mean\_x = sum(X) / len(X)

mean\_y = sum(y) / len(y)

# Calculating the coefficients

numerator = sum((X[i] - mean\_x) \* (y[i] - mean\_y) for i in range(len(X)))

denominator = sum((X[i] - mean\_x) \*\* 2 for i in range(len(X)))

b1 = numerator / denominator

b0 = mean\_y - b1 \* mean\_x

# Making predictions

new\_X = 6

prediction = b0 + b1 \* new\_X

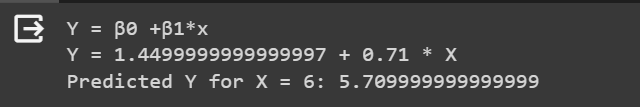
# Printing the prediction

print(f"Y = β0 +β1\*x")

print(f"Y = {b0} + {b1} \* X")

# Printing the prediction

print(f"Predicted Y for X = {new\_X}: {prediction}")



import math

# Sample input data

X = [1, 2, 3, 4, 5]

y = [2, 3.5, 2.8, 4.6, 5.0]

# Calculate the mean of X and y

mean\_X = sum(X) / len(X)

mean\_y = sum(y) / len(y)

# Calculate the numerator and denominators for the correlation coefficient (r)

numerator = sum((X[i] - mean\_X) \* (y[i] - mean\_y) for i in range(len(X)))

denominator\_X = math.sqrt(sum((xi - mean\_X) \*\* 2 for xi in X))

denominator\_y = math.sqrt(sum((yi - mean\_y) \*\* 2 for yi in y))

# Calculate the correlation coefficient (r)

r = numerator / (denominator\_X \* denominator\_y)

# Calculate the predicted value of y for a new value of x

new\_X = 6

predicted\_y = mean\_y + r \* (denominator\_y / denominator\_X) \* (new\_X - mean\_X)

# Print the predicted value of y

print(f"Mean y = {mean\_y}")

print(f"r = {r}")

print(f"Mean x= {mean\_x}")

print(f"New value = {new\_X}")

print(f"Y = mean y + [r \* (σy / σx) \* (X - mean x)]")

print(f"Y = {mean\_y} + [{r} \* {denominator\_y} / {denominator\_X}] \* {new\_X} - {mean\_X})")

print(f"Y= {predicted\_y}")

