Date: 31.08.24

TITLE : IMPLEMENTATION AND ANALYSIS OF LINEAR REGRESSION

TASKS

1. The following table consists of one student athlete's time (in minutes) to swim 2000 yards and the student's heart rate (beats per minute) after swimming on a random sample of 10 days:

Swim Time	Heart Rate
34.12	144
35.72	152
34.72	124
34.05	140
34.13	152
35.73	146
36.17	128
35.57	136
35.37	144
35.57	148

Part A
  a. Estimate Coefficients using formula and regression line .
  b. Visualise the data using a scatter plot.
Part B
  c. Use your regression function to find the equation of the least-squares regression line. Add this to your scatter plot from part a.
  d. Find the slope and y-intercept of the regression line.
  e. How well does the regression line fit the data?

f. Which point has the largest residual?

1) A simple linear regression model to express drain current Id (in milli Ampere) as a function of ground-to-source voltage Vgs (in Volts) for a MOS transistor is hypothesized. The drain current and the ground-to-source voltage data were measured and is shown in the following table.

Drain Current Id (mA)	Gate-to-Source Voltage (V)
0.734	1.1
0.886	1.2
1.04	1.3
1.19	1.4
1.35	1.5
1.50	1.6
1.66	1.7
1.81	1.8
1.97	1.9
2.12	2.0

Draw a Scatter diagram for these data. Does a straight-line relationship seem plausible?

(b) Fit a simple linear regression model to these data.

SPOT :

1) The Student Performance Dataset is a dataset designed to examine the factors influencing academic student performance. The dataset consists of 10,000 student records, with each record containing information about various predictors and a performance index.

Fit a regression model to analyse the factors Affecting Student Performance.