

LAB# 7 SIMPLE LINEAR REGRESSION

CST8233 W2021



LAB OBJECTIVE

The objective of this lab is to get familiar with the following:

- 1- Simple Linear Regression

Earning

To earn your mark for this lab, each student should finish the lab's requirements within the lab session and demonstrate the working code to the instructor.

STATEMENT OF THE PROBLEM:

Part A:

Linear regression consists of finding the best-fitting straight line through the points. The best-fitting line is called a regression line.

- 1- Use least-squares regression to fit a straight line to the following data:

x	0.0	1.0	2.0	2.5	3.0
y	2.9	3.7	4.1	4.4	5.0

To measure the accuracy of the best-fit straight line (regression line) we compute the average distance from the regression line, we called it the **standard error**

Standard error represents the average distance that the observed values fall from the regression line. It tells us how wrong the regression model is on average using the units of the response variable

- 2- Compute the Standard Error to show how well does the regression equation fit the data.

Show all your steps to your instructor

Part B:

Write a C/C++ program to implement the simple linear regression algorithm(given in the lecture).

The program asks the user to input the data then prints the linear regression equation.

Design your program to read any number of data, don't write your program to only match the example given.

Your output format should be like the following:

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```
Enter the no. of data pairs to be entered:
5

Enter the x-axis values:
20.5
32.7
51.0
73.2
95.7

Enter the y-axis values:
765
826
873
942
1032
```

S.no	x	y(observed)	y(fitted)
1.	20.5	765	771.767
2.	32.7	826	813.184
3.	51	873	875.311
4.	73.2	942	950.677
5.	95.7	1032	1027.06

The linear fit line is of the form:

$$y = 3.39487x + 702.172$$