

CS 6301 - Machine Learning Lab - Week 5

Date: 01.09.23

TITLE : IMPLEMENTATION AND ANALYSIS OF LINEAR REGRESSION

TASKS

1. Implement Linear Regression for the given Data

$x = [5, 7, 8, 7, 2, 17, 2, 9, 4, 11, 12, 9, 6]$

$y = [99, 86, 87, 88, 111, 86, 103, 87, 94, 78, 77, 85, 86]$

1. Calculate Mean and Variance.
2. Estimate Coefficients.
3. Make Predictions.
4. Predict y for any value of x .

2. 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

- a. Visualise the data using a scatter plot.

- b. Use your regression function to find the equation of the least-squares regression line. Add this to your scatter plot from part a.
- c. Find the slope and y -intercept of the regression line.
- d. How well does the regression line fit the data?
- e. Which point has the largest residual?