Labwork 2: Linear Regression

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1 Introduction

Linear Regression: Finding a line/plane/hyperplane to represent for data. In this example, with 2 dimensional data, we can represent data by a line in the form of y = w0*x + w1. Calculating value of w0 and w1: w0 called as slope can be calculated as:
w1 called as intercept can be calculated as:
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In linear regression, the line of best fit is expressed as:

$$y = w0x + w1$$

The slope ($w0$) of the linear regression line is calculated using the formula:

$$w0 = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sum(x_i - \bar{x})^2}$$

The intercept ($w1$) of the linear regression line is calculated using the formula:

$$w1 = \bar{y} - m \cdot \bar{x}$$

Where: - x_i and y_i are the values of the independent and dependent variables, respectively, for the i-th data point. - $\bar{x}$ and $\bar{y}$ are the mean (average) values of x and y.
The means of x and y can be calculated as follows:

$$\bar{x} = \frac{\sum x_i}{n}$$

$$\bar{y} = \frac{\sum y_i}{n}$$

Where n is the number of data points.