CS/CS 316/365 Deep Learning

August 22, 2024

Loss Calculation

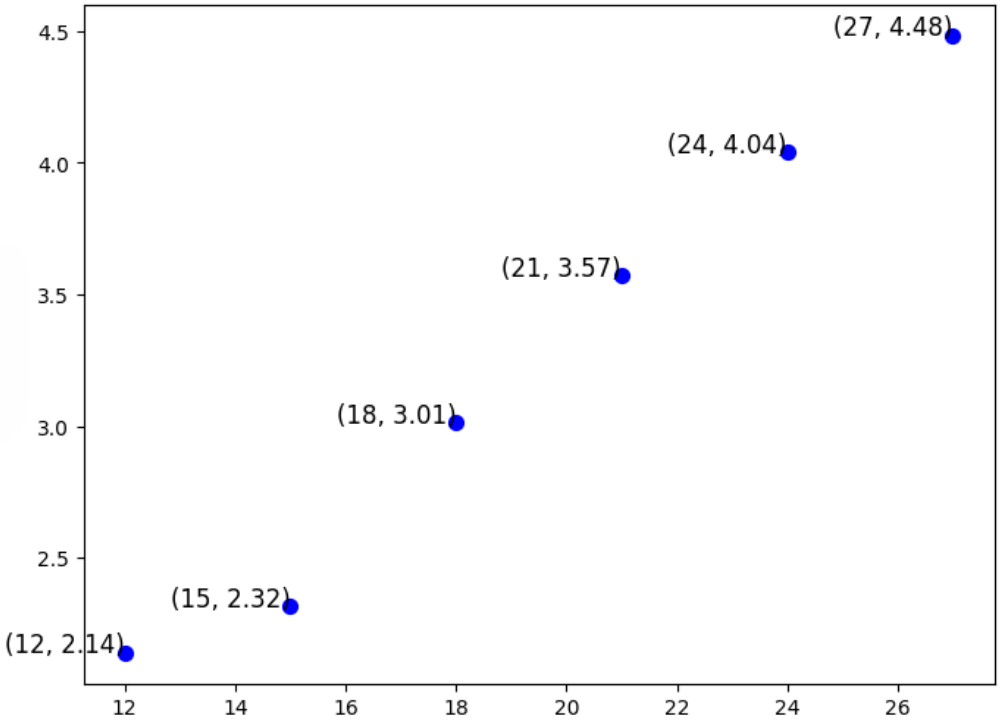
Let's consider a model $y = f[x, \phi]$ that predicts a single output y from a single input x. A 1D linear regression model describes the relationship between input x and output y as a straight line. Hence,

$$y = f[x, \phi]$$
$$y = \phi_0 + \phi_1 x$$

i.e. y is equal to sum phi-0 with product of phi-1 and x. phi-0 is our y-intercept and phi-1 is gradient.As we studied in class, the loss function of this model can be defined as:

$$L[\phi] = \sum_{i=1}^{I} (f[x_i, \phi] - y_i)^2$$
$$L[\phi] = \sum_{i=1}^{I} (\phi_0 + \phi_1 x_i - y_i)^2$$

For this model the training dataset consists of I input/output pairs $\{x_i, y_i\}$. Below given figure shows the data points.



Calculate the loss for this data and submit it before the start of next class. Solution should be handwritten. Please note that this activity is due before the class next week.