

# Problem Set 1 – Supervised Learning

DS598 B1 – DL4DS

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**Note:** Refer to the equations in the *Understanding Deep Learning* textbook to solve the following problems.

## Problem 2.1

To walk “downhill” on the loss function (equation 2.5), we measure its gradient with respect to the parameters  $\phi_0$  and  $\phi_1$ . Calculate expressions for the slopes  $\frac{\partial L}{\partial \phi_0}$  and  $\frac{\partial L}{\partial \phi_1}$ .

## Problem 2.2

Show that we can find the minimum of the loss function in closed-form by setting the expression for the derivatives from Problem 2.1 to zero and solving for  $\phi_0$  and  $\phi_1$ .