Linear Regression chap:linreg

In regression problems, we take a variable (or multiple variables) as input, and try to fit the output to a continuous expected result function.

Univariate Linear Regression chaplinreg-sect:univar

In univariate linear regression, we want to predict a single output value $\hat{y}$ from a single input value x. Since this is supervised learning, we already have an idea about what the input/output relationship should look like.

The Hypothesis Function chaplinreg-sectunivar-subsect:hypfunct

Imagine we have a problem where the input is x and the output is y. In order to do machine learning, there should exist a relationship (a pattern) between the input and output variables. Let's say this function is $y = f(x)$. In this situation, f is known as the target function. However, this function f is unknown to us, so we need to try and guess what it is. To do that, we form a hypothesis function $h(x)$ that approximates the unknown $f(x)$.

For single variable linear regression, our hytothesis function takes two parameters: θ_0 and θ_1. As such, we often write it as $h_\theta(x)$, and it takes the form equation $\hat{y} = h_\theta(x) = \theta_0 + \theta_1 x$