Stochastic Gradient Descent

STAT 672 Project

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Introduction

Stochastic gradient descent (SGD) is an optimization algorithm that is fundamental to many machine learning approaches. We will examine SGD from four perspectives.

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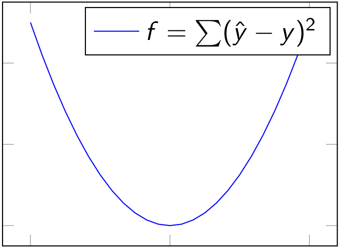
Optimization is everywhere, and sometimes easy

Many statistical procedures involve minimizing or maximizing some function applied to data

In **parametric** statistics, we often make assumptions about the distribution of the data that make this optimization "nice" (convex or concave)

OLS



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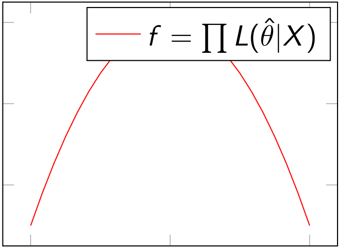

Other times, optimization is not easy

In **non-parametric** settings, we conduct **empirical risk minimization**

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