Small Exercises 6

Linear Classification

These exercises are meant as preparation for the inverted classroom lecture. Keep your answers short: two or three sentences, sometimes even less, should suffice.

Problem 1: Why do we use basis functions? What purpose do they serve?

Transform the data to a new space where we might be able to linearly separate the data points.

Problem 2: How can we use dimensionality reduction to make classification easier?

By finding the dimensions in which the data varies the most, we can potentially find linear directions in which we can maximally separate data between classes.

Problem 3: Why is logistic regression a classification method?

Using the sigmoid function forces the values to be discrete. (not sure this is an accurate description)

Problem 4: What loss function does the hinge loss function approximate?

logistic regression

Problem 5: In the lecture I mentioned a form for an optimally robust loss function. What was the problem with this form?

not convex

Problem 6: What is robustness of a loss function mean?

Problem 7: Why would someone want to be able to generate data points? (like a generative model allows us to do)