

Small Exercises 6

Linear Regression and Kernels

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

1 Linear Regression

Problem 1: Let's assume you are using a maximum likelihood version of the regression algorithm with a polynomial basis function. What can happen when the order of your polynomial is considerably higher than the number of training points?

Problem 2: Why is the bayesian formulation useful?

Problem 3: Which two assumptions do we make regarding the weight parameters and the data points when we use least squares regression with L_2 regularization?

2 Kernels

Problem 4: Why are kernels useful? I.e. how do they help us combat the curse of dimensionality?

Problem 5: What is difficult about proving a function is a kernel assuming that you can't use the kernel construction rules in the slide "Making Kernels with Kernels"?