Homework 6

Read: Chapters 8 and 12 from Classnotes.
Read: sections 7.1 and 12.3 of Bishop.

1) Derive the dual formulation of the SVM optimization problem (including slack variables). If you are stuck you may consult the literature to get yourself out of a local minimum. Use the primal formulation as derived in class (see slides).

2) Implement the SVM on the Iris dataset (2 class version). You may use a standard QP package do the optimization for you. Identify the support vectors.

3) Perform a kernel PCA analysis on the Iris dataset (ignoring the class labels). Plot the data projected onto the first two principal components. Use an RBF kernel. Change the kernel width (sigma) and see how it affects the results.