CS436/536: Introduction to Machine Learning
Homework 1
Due Thursday 2/1 **before the class**

Instructions: To solve these problems, you are allowed to consult your classmates, as well as the class textbook (*Learning from Data* by Abu-Mostafa, Magdon-Ismail, and Lin, which we will call LFD) and the slides posted on Brightspace, but no other sources. You are encouraged to collaborate with other students, while respecting the collaboration policy (please see the module on Academic Honesty on Brightspace). Please write the names of all the other students you collaborated with on the homework. Everyone must write up their assignments separately.

Please write clearly and concisely, and use rigorous, formal arguments. Homework is due at the beginning of lecture, and homework turned in later will be considered late and will use up one of your late days. You must use Brightspace to submit the homework as a single neatly typed pdf file. Hand-drawn formulas or figures are okay and may be included as images within the pdf. If a programming assignment calls for plotting the results, axes must be clearly labeled, and its meaning must be obvious to anyone with only a rudimentary knowledge of machine learning and computer science. Emailed copies will not be accepted.

(1) LFD Exercise 1.7. **[100 points]**

(2) LFD Exercise 1.8. **[50 points]**

(3) LFD Exercise 1.9. **[50 points]**

(4) LFD Exercise 1.10. **[100 points]**

(5) LFD Exercise 1.12. **[100 points]**

(6) LFD Problem 1.4 (a-e). **[300 points]**

(7) LFD Problem 1.7. **[300 points]**