University of TEHRAN

Machine Learning

Problem Set 3

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Problem 1: Review Questions
Write a summary of the lectures of this week. Write down all formulas we discussed in the lectures and explain in detail each step of derivations. As a guideline, you may consider the following topics:

(a) The bias-variance decomposition; example: sine target

(b) Maximum likelihood estimation; MLE for linear regression

(c) Maxiumum a posteriori; Bayesian interpretation of ridge regression

(d) **(Important)** Read carefully [ISL] 3.1-3, 6.1 (helpful readings for problems 2 and 3). No need to write a summary.

Problem 2: Conceptual questions
[ISL] chapter 2: questions 1, 3;

chapter 3: questions 1;

chapter 6: questions 1, 2a-b, 4c-e, 7a-c.

Problem 3: Programming: Linear regression
[ISL] chapter 3: questions 9, 14;

chapter 6: question 8.

We encourage discussing the problems with other students, however, similarity between solutions is not allowed. Please write in the first page of your submission whom you have brainstormed the questions. Submit your solutions (using Easyclass) by Mehr 21, 1398 (Sunday).