

Massachusetts Institute of Technology
Department of Electrical Engineering and Computer Science

6.011: SIGNALS, SYSTEMS AND INFERENCE

Spring 2018

Problem Set 6
MMSE and LMMSE Estimation

Reading: Chapter 8. To tackle the early problems here, you'll need to read through to Section 8.3.1, which is a little ahead of where we left off in lecture, but covers material already explored in Recitation 11.

Problem 6.1

Problem 8.11 (in the hardcover “North American” edition of SSI, which is Problem 8.6 in the softcover “Global Edition” of SSI), but in each part **also find** the LMMSE estimator, and determine the minimum mean square error of each of your estimators.

Problem 6.2

Problem 8.17 (which is Problem 8.19 in softcover SSI).

Problem 6.3

Problem 8.25 (which is Problem 8.27 in softcover SSI).

Problem 6.4

Problem 8.27, but **part (b) only** (this is Problem 8.26(b) in softcover SSI), but **change the specification of the random variables to:** Q distributed uniformly in the interval $[0, 6]$ and W distributed uniformly in the interval $[-1, 1]$, the two being independent of each other.

Problem 6.5

Problem 8.31 (which is Problem 8.30 in softcover SSI).

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