Massachusetts Institute of Technology
Department of Electrical Engineering and Computer Science

6.011: Signals, Systems and Inference

Spring 2018

Problem Set 9
Wiener Filtering

Reading: Sections 12.1–12.3, and from just after Example 12.7 through to the end of Section 12.4. The notation $[zF(z)]_+$ used in Eq. 12.92 denotes the z transform of the causal part of the inverse transform of $zF(z)$ (you'll see that operationally on the page before this equation). When you've read this last part, you'll be able to go back and make sense of Example 12.7. We will only deal with prediction this semester, not with the more general causal Wiener filtering described in Section 12.4.

Problem 9.1

Problem 12.5 (which is Problem 12.3 in the softcover edition)

Problem 9.2

Problem 12.6 (which is Problem 12.4 in the softcover edition), but **skip** part (c).

Problem 9.3

Problem 12.18 (which is Problem 12.17 in the softcover edition)

Problem 9.4

Problem 12.2 (which is Problem 12.13 in the softcover edition), but **only** parts (d), (e), (f).

Problem 9.5

Problem 12.11 (which is Problem 12.11 in the softcover edition too)

Problem 9.6

Problem 12.23 (which is Problem 12.19 in the softcover edition), but **also** determine the associated minimum mean square error in parts (b) and (c).

Problem 9.7 (Optional)

Problems 12.7, 12.10, 12.13, 12.14 (which are Problems 12.5, 12.8, 12.12, 12.16 in softcover).