

Indian Institute of Science

E9-252: Mathematical Methods and Techniques in Signal Processing

Instructor: Shayan G. Srinivasa

Home Work #5, Fall 2013

Late submission policy: Points scored = Correct points scored $\times e^{-d}$, $d = \#$ days late

Assigned date: Nov 11th 2013

Due date: Nov 28th 2013 in class

PROBLEM: The first 40 samples are known from an unknown system in response to an impulse. The text file data.txt contains this information. It is known that the total number of poles and zeros do not exceed 4.

- (1) Identify the system transfer function $H(z) = \frac{B(z)}{A(z)}$ using a suitable modeling method. Comment on the stability of the system vs. model accuracy.
- (2) Compare your method in the previous part with iterative pre-filtering technique.

(60 + 40 pts.)

NOTE: Your solution should include the original Matlab code along with your modeling experiments with mathematical derivations.