Due Monday, April 30, in class.

Problem 1.

13.9–25. The following PARCOR coefficients are computed from a frame of speech data: $p_1 = -0.9454$, $p_2 = 0.92386$, $p_3 = -0.56198$, $p_4 = -0.09454$, $p_5 = 0.20218$, $p_6 = 0.53595$, $p_7 = -0.32922$, $p_8 = -0.05899$.

(a) Do these coefficients represent a stable system?

(b) What is the mean squared prediction error for this 8th order system?

(c) Write a z-domain transfer function for the LPC synthesizer corresponding to these coefficients.

Problem 2.

13.9–26. An LPC system has the predictor coefficients $a_1 = 1.793$, $a_2 = -1.401$, $a_3 = 0.566$, and $a_4 = -0.147$. Let the receiver gain $G = 2$, the pitch period length $P = 60$, and assume that the speech is voiced. For zero initial conditions at the beginning of the pitch period, synthesize one pitch period of the speech with an impulse input.