Exercise 5 of Assignment 5 (due 2/11/08)

Compute an sdf estimate of the AR(4) time series X_t using the idea of prewhitening (Section 6.5) via the following steps (note that this series can be downloaded via the 'Data and Data Tapers' section of the Web page for the course).

1. Filter X_t using the prewhitening filter $g_0 = 1.0$ and $g_1 = -0.9$ to obtain the prewhitened series Y_t.

2. Compute the periodogram for Y_t and then postcolor it to create an estimate for the sdf of X_t. Plot this estimate in a manner similar to the two plots in Figure 227.

3. Comment on how well this estimate of the sdf for X_t compares to the two estimates plotted in Figure 227.

Finally, repeat all of the above using the prewhitening filter $g_0 = 1$ and $g_1 = -1$. Does it matter which of these two prewhitening filters we use here?