Notes: This homework can be done in ASTSA (downloaded from the textbook website) or R. However, it may be easier to use the ASTSA software (I recommend using R)? If you are using R, you will need the function “fft” (The book and text website contain useful code for doing this assignment in R.). The Fourier frequencies are as usual, $\nu_0, \nu_1, \ldots, \nu_{n-1}$. Unfortunately, however, they will be stored in locations numbered $1, \ldots, n$, since R vectors are always indexed starting at 1.

Plots of the periodogram should never include the zero frequency (i.e., the first location for an R vector), and should only be plotted at the Fourier frequencies which are less than or equal to .5. Make sure you understand why.

1. Problem 4.8 Shumway and Stoffer
2. Problem 4.9 Shumway and Stoffer
3. Examine the Flu deaths data set found in ASTSA (“infl”). Do a spectral analysis and identify any strong periodicities in the series. Can you assign any specific explanation to these periodicities?
4. Examine the GNP data found in ASTSA. Find any significant periodicities in the data and, if possible, suggest possible explanations. (Note, you must remove the trend first).