Statistics 726 **Assignment 2** **Due: April 15**

1. For a series of length 169, we find that $r(1) = .41$, $r(2) = .32$, $r(3) = .26$, $r(4) = .21$ and $r(5) = .16$. What ARMA model fits this pattern of autocorrelations?

2. Consider and AR(1) series of length 100 with $\phi = .7$.

   (a) Would you be surprised if $r(1) = .6$?

   (b) Would $r(10) = -.15$ be unusual?

3. Check the asymptotic theory for the distribution of $r(1)$ and $r(2)$ for an AR(1) series with $\phi = .5$ by taking 1000 series of length 100, computing the 1000 $r(1)$, $r(2)$ pairs and then computing the variance of the $r(1)$ and $r(2)$ values and the correlation between the $r(1)$ and $r(2)$ values. (Hint: use the `arma.sim` function to generate the series and the `acf` function to generate the acf values.)