**ECONOMETRICS II, FALL 2017**

**Homework 3. Due Wednesday September 20.**

1. Using the program I posted, simulate and estimate an AR(1)-model.
   - Run the “AR(1) Maximimum Likelihood” program.
   - Add to the AR-program an OLS regression of $x_t$ on a constant and a lag and compare the results (this has to either be done in the same regression or you set a “seed” for the random number generator so that the draws are identical).
   - Try different values of the autoregressive parameter. Does the conclusion change in the autoregressive parameter is very close to unity (like 0.99).
   - The program calculates standard deviations using the inverse Hessian. Add an estimator based on the outer products of the scores and compare. Compare the standard deviations.
   - Simulate and estimate an AR(2) model by maximimum likelihood. (The main thing here is the coding of the AR(2), but you may want to repeat otherwise what you did for the AR(1).)

4. Davidson and MacKinnon 11.7.

5. Davidson and MacKinnon 11.8.