

Advanced Programming in Quantitative Economics

Introduction, structure, and advanced programming techniques

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Tutorial Day 1 - Afternoon

14.30 Targets:

1. Learn some syntax
2. *Use* the syntax
3. Get a simulation running

16.00 End for today

Learning syntax

Four sources for now:

- ▶ Introduction to Ox (included in help system as PDF)
- ▶ Syntax sheets (see webpage, PDF)
- ▶ Language tutorial (included in help system as HTML)
- ▶ Tutors

Check out those sources first, find your way through.

Spend first \pm half hour on one of those sources, such that you know most important syntax.

Exercise OLSGenS

Take the model

$$y = \mathbf{X}\beta + \epsilon \quad \epsilon \sim \mathcal{N}(0, \sigma^2)$$

with $n = 20$ observations, $\beta = [1; 2; 3]$, $\sigma = 0.25$ and $\mathbf{X} = [1 \ u_1 \ u_2]$ where $u_i \sim U(0, 1)$.

1. Write a program which creates the \mathbf{X} matrix; print it, and make sure it is what you want it to be. Save the program as `olsgens0.ox`.
2. Generate data y from the model. Is the mean of y roughly what you expect it to be? Save the program as `olsgens1.ox`.

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3. Estimate b using OLS. Is the estimate decent? Save as `olsgens2.ox`.
4. Add a loop, such that you generate $S = 1000$ samples of y successively, and for each estimate and store b . Print as output the mean and variance of the estimated b 's. Save the program with the name `olsgens3.ox`.
5. Compare the results you get with the theoretical covariance matrix of $\Sigma = \sigma^2(X'X)^{-1}$. Does it all still make sense? Save as `olsgens4.ox`.

Tomorrow

Try to get along with the exercise; leave it in your personal directory for us to check; leave a `olsgen.txt` next to it with questions to ask, if you have any.

Mind you: Course is to get practice, not to do everything 'perfect' at the first try.