In-Class Lab assignment:
Learning How to Export Estimation Results

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This lab exercise will familiarize students with the different ways to export estimation results from Matlab to Excel or LaTeX.

Materials needed:

- Laptop
- Access to Matlab
- Access to Microsoft Excel
- Access to LyX
- Excel plugin `excel2latex` (available at `http://www.ctan.org/tex-archive/support/excel2latex/`)
- Mathworks user-written file `matrix2latex` (available at `http://www.mathworks.de/matlabcentral/fileexchange/4894-matrix2latex`, or see my modified version on the course website)

Calculate Model Estimates

1. Open up Matlab and load the dataset `carbig.mat`
2. Create a vector `y` that is the variable `Acceleration`. Create a matrix `X` that is an intercept, `Cylinders`, `Displacement`, `Weight`, and a dummy for if the car was made before the year 76.
3. Calculate the OLS coefficients for this model, i.e. `b = X\y;`
4. Calculate the standard errors of these coefficients assuming homoskedasticity, i.e. `se=sqrt(diag(((y-X*b)'*(y-X*b))/(size(X,1)-size(X,2))*((X'*X)\eye(size(X,2)))));`
5. Calculate the t-statistics for the (two-sided) hypothesis test $H_0 : \beta = 0$, $H_1 : \beta \neq 0$; i.e. `t=b./se;`
6. Calculate the p-values for the hypothesis test, i.e. `p=2*(1-tcdf(abs(t),size(X,1)-size(X,2)));`

Exportation Method 1(a): By Hand into LyX

1. With the estimation results computed, create a cell array that concatenates them, i.e. `estimates = num2cell([b se t p]);`
2. Now create a cell array with a string column vector of variable names, i.e. `varnames = cellstr(char('Intercept','Cylinders','Displacement','Weight','Older Model'));`
3. Now create a string row vector of headers, i.e. `headers = cellstr(char('Variable','Coefficient','Standard Error','T-stat','p-value'))';`
4. Now create a cell array that contains all information required: `result = cat(1,headers,cat(2,varnames,estimates));`

5. Now export this by hand to Excel:
   (a) Open `result` in the workspace viewer
   (b) Select all elements of `result`, and copy
   (c) Open up Excel and paste into the first cell (A1)
   (d) Adjust the number of decimal points to 3
6. Now export from Excel to LyX:
   (a) Open up LyX and create a Table that has the same number of elements as your Excel spreadsheet
   (b) Copy from Excel
   (c) Paste into the top-left cell in LyX using Ctrl+Shift+V or Cmd+Shift+V

Exportation Method 1(b): By Hand into TeX

1. Repeat steps 1-5 of Method 1(a). Now, instead of pasting from Excel to LyX, use the Excel add-on `excel2latex`
2. Select all of the elements of the Excel spreadsheet
3. Find the excel2latex add-on and copy the code to the clipboard
4. Open up LyX and type Ctrl+L or Cmd+L
5. Paste the code from the clipboard into the red box created in step 4

Exportation Method 2: Automatically into Excel

1. Repeat steps 1-4 of Method 1(a).
2. Now export directly to Excel using `xlswrite`; i.e. `xlswrite('estimation_results.xlsx',result,1)`
3. Open the file `estimation_results.xlsx` and view your results

Exportation Method 3: Automatically into TeX

1. Repeat steps 1-3 of Method 1(a).
2. Instead of `estimates = num2cell([b se t p]);` create a simple numerical array `estimates1 = [b se t p];`
3. Now export directly to LaTeX using `matrix2latex`; i.e. `matrix2latex(estimates1, 'estimation_results.tex','rowLabels', varnames, 'columnLabels', headers, 'alignment', 'c','format', '%7.3f');`
4. Now input this .tex file into LyXusing the `\input{}` command. To do this, click Insert▶File▶Child Document and then choose the file path. Under Include Type choose Input.