

Computer Homework 3

The file `ols.m` is an *Octave* function file for OLS estimation. A copy of this program, with comments, is provided below. This program illustrates selection of variables from a mat data file for use in an estimation procedure, construction and manipulation of data matrices, and formatting of output. The next computer homework will generalize this program to allow non-linear ML estimation with the BHHH algorithm.

If you have installed the econometrics package for *Octave*, you will need to change the name of this file from `ols.m` to something different, say `olsx.m`. You will also need to edit the first line of the file to match, say `"function beta=olsx(data,dep,ind)"`. You will use this same language when you execute the file. (The econometrics package installs a native function called OLS, so the name is reserved. If you have not installed the econometrics package, there will be no problems.)

Use the function file `ols.m` and the data file `mls.mat` to estimate a linear probability model of probability of sale, where the dependent variable is SOLD and the regressors are AGE, LOT, SQFT, BEDS, GAR, MFI, PMIN, PAVED, FIN, VAC, TRAV, AP. The following series of commands illustrate how to use this program in *Octave*. When typing command lines, do not include double quotes.

1. In WINDOWS, double click the *Octave* icon.
2. At the *Octave* prompt, type `"cd 5427"`. (This assumes that the relevant files are in the folder 5427.)
3. At the *Octave* prompt, type `"data='mls'; bin='sold'; ind='age lot sqft';"`. (This creates the string `data`, which gives the name of the *Octave* data FILE, and the strings `bin` and `ind`, which give the dependent variable and regressors.)
4. At the *Octave* prompt, type `"ols(data,bin,ind)"`. (This executes the program. When the procedure is finished, the *Octave* prompt will return.)
5. Select Exit from the File menu to return to WINDOWS.

The next page illustrates successful application of the OLS program for a simple specification.

GNU Octave, version 5.2.0
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```
>> cd 5427;  
>> data='mls';bin='sold';ind='age lot sqft';  
>> olsx(data,dep,ind);
```

OLS Estimates - The dependent variable is: sold
The data set is: mls

Regressor	Coefficient	Std. Error	t-stat	Prob> t
Con	0.54343	0.08960	6.06476	0.00000
age	-0.00669	0.00269	-2.48490	0.01353
lot	-0.00106	0.00055	-1.92690	0.05498
sqft	0.03500	0.04610	0.75911	0.44841

```
>>
```

ols.m

```
% Octave function for OLS estimation -
% data is a string naming a .mat file dataset
% dep is a string naming the dependent variable
% ind is a string of space delimited labels listing the regressors.

function beta=olsx(data,dep,ind);
clc

% -----
% This section reads data.

load(data);           % Loads data from *.mat file.
y=eval(['',dep,'']);  % Selects dependent variable.
nobs = size(y,1);      % Determines sample size.
x=eval(['',ind,'']);  % Selects regressors.
x = [ ones(nobs,1) x ]; % Adds intercept.
km = size(x,2);        % Determines number of regressors.
df = nobs-km;          % Determines degrees of freedom.

% -----
% Prints title to identify output.

fprintf('OLS Estimates - The dependent variable is: %s\n',dep);
fprintf('The data set is: %s\n',data);
fprintf('\n');

% -----
% Obtain point estimates.

vc=inv(x'*x);
beta=vc*(x'*y);
s2=(y-x*beta)*(y-x*beta)/df;
vc=s2.*vc;

% -----
% Compute Statistics.

stderr = sqrt(diag(vc));           % Compute standard errors.
t = beta./stderr;                 % Compute t-statistics.
pvt=1-fcdf(t.^2,1,df);            % Compute p-values.

% -----
% Print Output

ind = [ 'Con' ind];
ind=strsplit(ind);
fprintf('\n');
fprintf('Regressor \t Coefficient \t Std. Error \t t-stat \t Prob>|t|\n');
fprintf('-----\n');
for h=1:km;
fprintf('%-10s',ind{h});
fprintf(['\t%12.5f \t%12.5f \t%12.5f \t%12.5f\n'], [beta(h) stderr(h) t(h) pvt(h)]);
end;
```