Data Handling

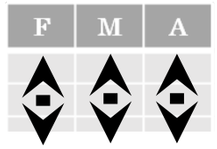
with Gretl Cheat Sheet

https://gretl.sourceforge.net/

Gretl command reference, function reference & User's Guide

Gretl Data

In a Gretl data set:

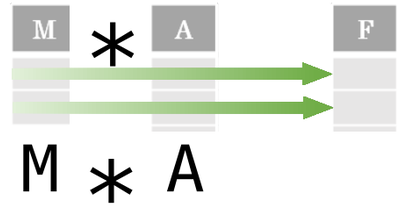


&

Each **variable** is saved in its own **column**

Each **observation** is saved in its own **row**

Tidy data complements Gretl's **vectorized operations**. Gretl will preserve observations as you manipulate variables.



Creating Datasets

	a	b	c
1	4	7	10
2	5	8	11
3	6	9	12

```
nulldata 3
series a = {4; 5; 6}
series b = {7; 8; 9}
series c = {10; 11; 12}
```
Specify values for each column.

	Index	a	b
1:01	1	4	8
1:02	2	5	9
2:01	3	6	10
2:01	4	7	11

```
nulldata 4
series a = {4; 5; 6; 7}
series b = {8; 9; 10; 11}
setobs 2:2 --stacked-time-series
```
Create a panel dataset.

Print Values

```
print object
```
Print some object.
```
printf format , args
```
Print some object under control of a format string.

Open And Store Data

```
open denmark.gdt
```
Open a local dataset. Supports various data types such as plain text, csv, MS Excel, Stata, SPSS, GEOJson etc.)

```
store MyFile.csv
```
Save data to some file. Support for native format, csv, txt, GNU Octave and Stata.

```
store --matrix=mat MyFile.csv
```
Save a matrix as a dataset.

```
open dbnomics
```
Connect to the dbnomics database.

Reshaping Data – Change layout, sorting, reindexing, renaming

```
dataset transpose
```
Gather columns into rows.

Index	a	b
1	4	8
2	5	9
3	6	10

Index	c
1	4
2	5
3	6
4	8
5	9
6	10

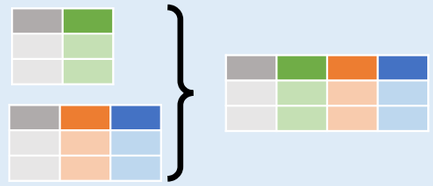
```
list L = a b
series c = stack(L, n)
```
Stack *n* observations from each series in *L*.

id	a	b
1	4	8
2	5	9
3	6	10

key	c	d
1	11	15
2	12	16
3	13	17
4	14	18

id	a	b	c	d
1	4	8	11	15
2	5	9	12	16
3	6	10	13	17

```
join dfile --ikey=id --okey=key
```
Left-join of another datafile *dfile*.



```
append filename
```
Append columns and rows from another file.

```
dataset sortby mpg
```
Order rows of dataset by values of series (low to high).

```
dataset addobs n
```
Adds *n* extra observations to the end of the dataset.

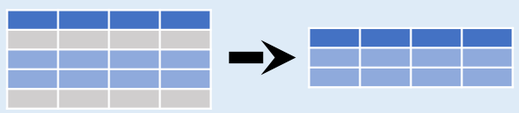
```
rename y year
```
Rename the series *y* of a dataset into *year*.

```
delete L
```
Drop list of series, *L*, from dataset.

```
setobs 1 1 --cross-section
```
Reset index of dataset to row numbers.

```
setobs 12 2000:1 --time-series
```
Set index of dataset to monthly time-series.

Subset Observations - rows



```
smpl Length > 7 && Width < 3 \
  --restrict
```
Restrict to rows that meet logical criteria.
```
dataset resample n
```
Randomly select *n* rows.
```
smpl a >= values(a)[n] --restrict
```
Select top *n* entries based on series *a*.
```
smpl a <= values(a)[end-2] --restrict
```
Select bottom *n* entries based on series *a*.
```
smpl 1 n
```
Select first *n* rows.
```
smpl ($tmax – n) $tmax
```
Select last *n* rows.
```
smpl full
```
Restore full dataset.

Working With Lists (ch. 15 in the User's Guide)

```
list L = Length Width
```
Add multiple series with specific names to list.
```
list L = 1 2 3
```
Add multiple series using the ID number to list.
```
list L = y_*
```
Add series with the prefix „y_“ to list using the wildcard character.
```
list L delete
```
Remove list *L* from memory.
```
delete L
```
Delete the series contained in list *L*.
```
L += x
```
Append series *x* to list *L*.
```
L -= x
```
Remove series *x* from list *L*.

```
list L2 = mpg L1 Width
```
Append to a list individual series as well as lists.
```
list L3 = L1 || L2
```
Union of two lists removing duplicates.
```
list L3 = L1 && L2
```
Intersection of two lists incl. eventual duplicates.
```
list L3 = L1 - L2
```
Remain all elements of *L1* that are not in *L2*.
```
list L2 = L1[1:4]
```
Only pass the first four members of *L1*.
```
nelem(L)
```
# of elements in list *L*.
```
inlist(L, y)
```
Return the 1-based position of series *y* if present in *L*, otherwise zero.
```
list H = X ^ Z
```
Compute interaction terms between x_i and z_i.

Logic in Gretl

<	Less than	!=	Not equal to
>	Greater than	contains(object, S)	Object contains any of the elements of S
==	Equals	missing(y)	Is NaN
<=	Less than or equals	ok(y)	Is not NaN
>=	Greater than or equals	&&,||	Logical and, or, not, xor, any, all

regex (Regular Expressions) Examples

regsub(S, "\.", ",")	Replace all ',' by '.'
regsub(S, "Foo$", "")	Delete 'Foo' if the string ends with 'Foo'
regsub(S, "^My", "")	Delete 'My' if the string starts with 'My"

Cheatsheet for Gretl by Artur Tarassow (https://github.com/atecon/gretl_cheatsheet). Originally written by Irv Lustig, Princeton Consultants, inspired by Pandas cheat sheet.

Summarize Data

nobs(y)
# of non-missing observations in dataset.

$nobs
# of observations of active dataset.

nelem(dataset)
# of variables in dataset.

values(y)
Distinct values of a series sorted in ascending order.

summary y x
Basic descriptive and statistics for variables. The table of statistics produced can be retrieved in matrix form via the **$result** accessor.

Gretl provides a large set of summary functions that operate on different kinds of Gretl objects (series, list and matrix) depending on the function.

If *y* is a series, the following functions return a scalar values.

sum(y)
Sum values of series.

nobs(y)
# of non-NA values of series.

median(y)
Median value of series.

quantile(y, 0.25)
Quantiles of series.

skewness(y)
Skewness of series.

min(y)
Minimum value of series.

max(y)
Maximum value of series.

mean(y)
Mean value of series.

var(y)
Variance of series.

sd(y)
Standard deviation of series.

If *y* is a list, the functions return a series holding the applied summary statistics computed across all columns for each row.

Handling Missing Data

smpl L --no-missing
Drop rows of list L with any column having *NA* data.

series y = ok(y) ? y : value
Replace all *NA* data with *value* for series *y* (ternary operator).

b = replace(y, find, subst)
Replace each element of *y* (a scalar or vector).

Make New Series

For some of the functions, *L* can be a series, list or matrix.

series y = NA
Create a single series initialized with NA values.

series Volume = Length*Height*Depth
Create single series.

series lY = log(L)
Logarithm of a series.

series dY = diff(L)
First difference of a series.

series Ylag = Y(-1)
Create lag of series.

series lY = ldiff(L)
First difference of logarithm.

series dY = sdiff(L)
Create seasonal difference the logarithm.

series Ylead = Y(+1)
Create lead of series.

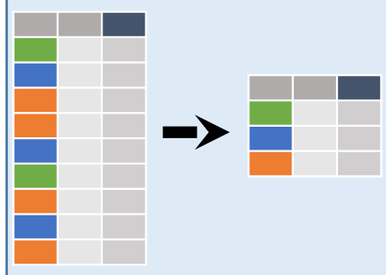
index	a	b
1	4	8
2	8	5
3	6	6

➡

index	a	b	c
1	4	8	4
2	8	5	5
3	6	6	6

series min_ab = min(deflist(a, b))
Minimum across a list of series for each row.

Aggregation



The following built-in functions can be applied: sum, *sumall*, *mean*, *sd*, *var*, *sst*, *skewness*, *kurtosis*, *min*, *max*, *median*, *nobs*, *gini*, *isconst*, *isdummy*.

open data4-1
m = aggregate(null, bedrms)
Count the observations for each distinct value of *byvar*.

byvar	count
3	5
4	9

matrix m = aggregate(sqft, bedrms, mean)
Group by *bedrms* and compute the mean of *sqft* for each group.

byvar	count	f(x)
3.0000	5.0000	1563.8
4.0000	9.0000	2103.8

list L = sqft price
eval aggregate(L, bedrms, sd)
Group each item of *L* by *bedrms* and compute the standard deviation for each group.

byvar	count	sqft	price
3.0000	5.0000	610.20	125.94
4.0000	9.0000	488.98	59.404

list BY = bedrms baths
eval aggregate(L, BY, median)
Group each item of *L* by *BY* and compute the median for each group.

Using Packages (click)

pkg install addlist
Install package *addlist* from the gretl package server.

include addlist.gfn
Load the package into memory.

help addlist
Show the help file for the package.

Working Directory

$workdir
Find the current working directory (inputs are found and output are sent).

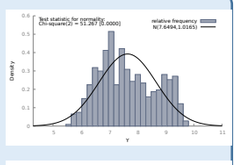
set workdir PATH
Set current working directory.

$dotdir
Path for storing temporary files.

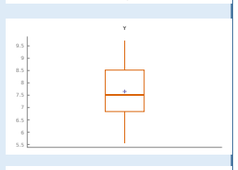
$sysinfo
Returns information on the capabilities of the gretl build and the system.

Plotting

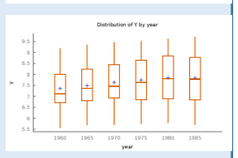
freq y --normal --plot=display
Histogram for series *y*.



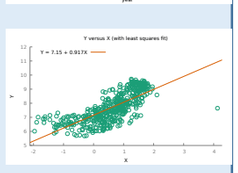
boxplot y --output=display
Boxplot for series *y*.



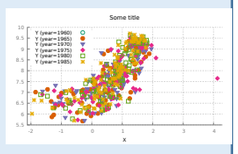
**boxplot y year --factorized **
--output=display
Boxplot for series *y* grouped by *year*.



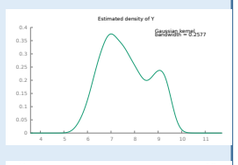
**gnuplot y x --fit=linear **
--output=display
Scatterplot with linear fit.



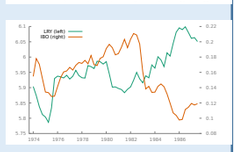
**gnuplot y x year --dummy **
**--output=display **
**{set title "Some title" **
font ',14'; set grid lw 2;}
Scatterplot for each discrete value of *year* plus calling some gnuplot options for tweaking.



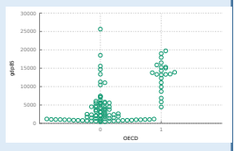
kdplot y --output=display
Kernel density plot.



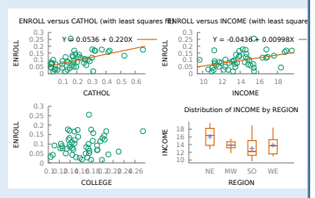
**gnuplot y x --with-lines **
**--time-series **
--output=display
Time-series plot.



**gnuplot y x --output=display **
{ set jitter overlap 0.5;
set grid;}
Scatter plot with jitter points.



open data4-10
strings MyPlots
gpbuild MyPlots
gnuplot ENROLL CATHOL
gnuplot ENROLL INCOME
gnuplot ENROLL COLLEGE
boxplot INCOME REGION --factorized
end gpbuild
gridplot MyPlots --output=display
Matrix of subplots.



corr L --triangle --plot=display
Plot of a correlation matrix.