

Data Handling

with Gretl Cheat Sheet

<https://gretl.sourceforge.net/>

Gretl command reference, function reference & User's Guide

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

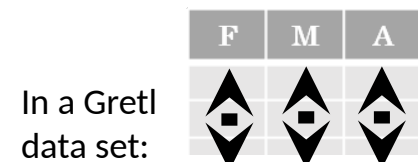
open denmark.gdt
Open a local dataset. Supports various data types such as plain text, csv, MS Excel, Stata, SPSS, GEOJson etc.)

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

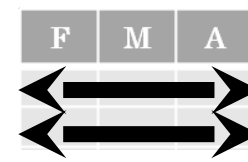
store --matrix=mat MyFile.csv
Save a matrix as a dataset.

open dbnomics
Connect to the dbnomics database.

Gretl Data

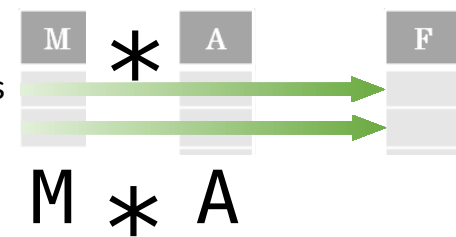


Each **variable** is saved in its own **column**

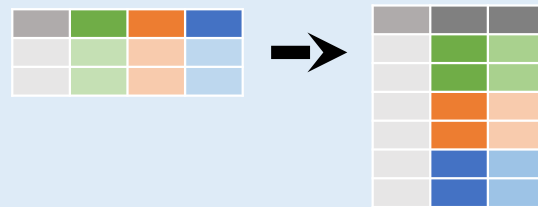


Each **observation** is saved in its own **row**

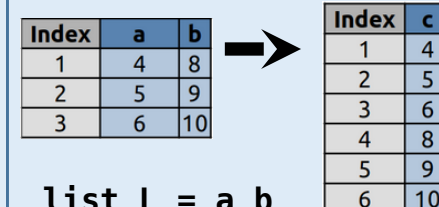
Tidy data complements Gretl's **vectorized operations**. Gretl will preserve observations as you manipulate variables.



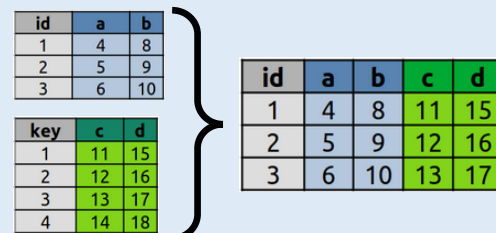
Reshaping Data - Change layout, sorting, reindexing, renaming



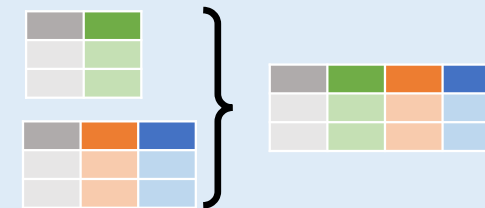
dataset transpose
Gather columns into rows.



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



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*.

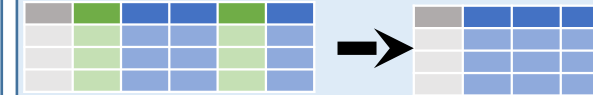
smpl 1 n

Select first *n* rows.

smpl (\$tmax - n) \$tmax

Select last *n* rows.

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 <i>S</i>
==	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'

Summarize Data

nobs(y)

of observations in 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)

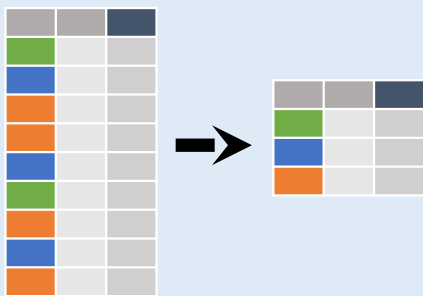
Variance of series.

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.

Aggregation



open data4-1

m = aggregate(null, bedrms)

Count the observations for each distinct value of *byvar*.

matrix m = aggregate(sqft, bedrms, mean)

Group by *bedrms* and compute the mean of *sqft* for each group.

list L = sqft price

eval aggregate(L, bedrms, sd)

Group each item of *L* by *bedrms* and compute the standard deviation for each group.

list BY = bedrms baths

eval aggregate(L, BY, median)

Group each item of *L* by *BY* and compute the standard deviation for each group.

byvar count

3 5

4 9

byvar count f(x)

3.0000 5.0000 1563.8

4.0000 9.0000 2103.8

byvar count sqft price

3.0000 5.0000 610.20 125.94

4.0000 9.0000 488.98 59.404

Handling Missing Data

smpl L --no-missing

Drop rows of list *L* with any column having NA data.

series y = ok(y) ? y : value

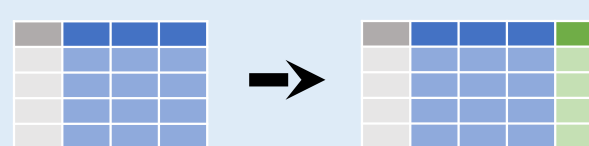
Replace all NA data with *value* for series *y* (ternary operator).

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

Add a single series initialized with NA values.

series Volume = Length*Height*Depth

Add single series.

series lY = log(L)

Logarithm of a series.

series dY = diff(L)

First difference of a series.

series Ylag = Y(-1)

Add lag of series.

series lY = ldiff(L)

First difference of logarithm.

series dY = sdiff(L)

Seasonal difference the logarithm.

series Ylead = Y(+1)

Add lead of series.

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.

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.

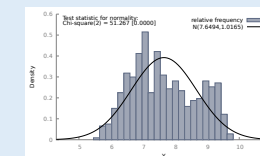
\$sysinfo

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

Plotting

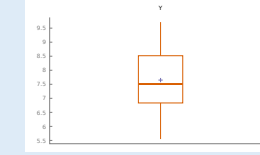
freq y --normal --plot=display

Histogram for series *y*.



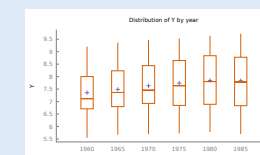
boxplot y --output=display

Boxplot for series *y*.



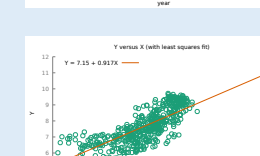
boxplot y year --factorized \ --output=display

Boxplot for series *y* grouped by *year*.



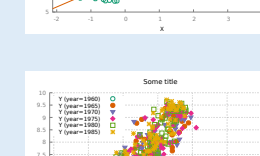
gnuplot y x --fit=linear \ --output=display

Scatterplot with linear fit.



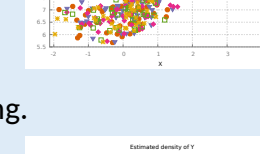
gnuplot y x year --dummy \ --output=display \ {set title "Some title" \ font ',14'; set grid lw 2;}

Scatterplot for each discrete value of *year* plus calling some gnuplot options for tweaking.



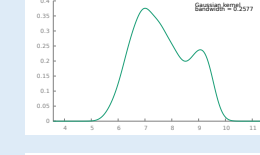
kdplot y --output=display

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

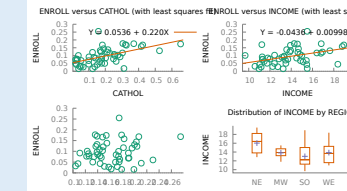
gnuplot ENROLL COLLEGE

boxplot INCOME REGION --factorized

end gpbuild

gridplot MyPlots --output=display

Matrix of subplots.



corr L --triangle --plot=display

Plot of a correlation matrix.

