

**graph twoway lowess** — Local linear smooth plots

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## Description

`graph twoway lowess` plots a lowess smooth of *yvar* on *xvar* using `graph twoway line`; see [G-2] [graph twoway line](#).

## Quick start

Local linear smooth plot of *y* versus *x* using Cleveland's tricube weighting function with a bandwidth of 0.8

```
twoway lowess y x
```

As above, overlaid on a scatterplot of *y* versus *x*

```
twoway scatter y x || lowess y x
```

As above, but draw points with less intense color to make the line more visible

```
twoway scatter y x, mcolor(*.6) || lowess y x
```

Use running-mean smoothing

```
twoway scatter y x || lowess y x, mean
```

Specify a bandwidth of 0.5

```
twoway scatter y x || lowess y x, bwidth(.5)
```

Suppress use of Cleveland's tricube weighting function

```
twoway scatter y x || lowess y x, noweight
```

## Menu

Graphics > Twoway graph (scatter, line, etc.)

# Syntax

`twoway lowess yvar xvar` [if] [in] [, options]

<i>options</i>	Description
<code>bwidth(#)</code>	smoothing parameter
<code>mean</code>	use running-mean smoothing
<code>noweight</code>	use unweighted smoothing
<code>logit</code>	transform the smooth to logits
<code>adjust</code>	adjust smooth's mean to equal <i>yvar</i> 's mean
<i>cline_options</i>	change look of the line
<i>axis_choice_options</i>	associate plot with alternative axis
<i>twoway_options</i>	titles, legends, axes, added lines and text, by, regions, name, aspect ratio, etc.

# Options

`bwidth(#)` specifies the bandwidth. `bwidth(.8)` is the default. Centered subsets of  $N \times \text{bwidth}()$  observations,  $N$  = number of observations, are used for calculating smoothed values for each point in the data except for endpoints, where smaller, uncentered subsets are used. The greater the `bwidth()`, the greater the smoothing.

`mean` specifies running-mean smoothing; the default is running-line least-squares smoothing.

`noweight` prevents the use of Cleveland's (1979) tricube weighting function; the default is to use the weighting function.

`logit` transforms the smoothed *yvar* into logits.

`adjust` adjusts by multiplication the mean of the smoothed *yvar* to equal the mean of *yvar*. This is useful when smoothing binary (0/1) data.

*cline\_options* specify how the lowess line is rendered and its appearance; see [G-3] *cline\_options*.

*axis\_choice\_options* associate the plot with a particular *y* or *x* axis on the graph; see [G-3] *axis\_choice\_options*.

*twoway\_options* are a set of common options supported by all *twoway* graphs. These options allow you to title graphs, name graphs, control axes and legends, add lines and text, set aspect ratios, create graphs over `by()` groups, and change some advanced settings. See [G-3] *twoway\_options*.

# Remarks and examples

stata.com

`graph twoway lowess yvar xvar` uses the `lowess` command—see [R] [lowess](#)—to obtain a local linear smooth of *yvar* on *xvar* and uses `graph twoway line` to plot the result.

Remarks are presented under the following headings:

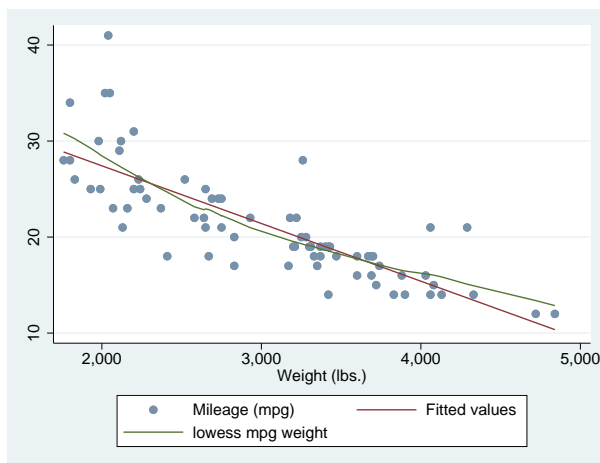
Typical use  
Use with `by()`

## Typical use

The local linear smooth is often graphed on top of the data, possibly with other regression lines:

```
. use https://www.stata-press.com/data/r17/auto
(1978 automobile data)

. twoway scatter mpg weight, mcolor(*.6) ||
      lfit    mpg weight      ||
      lowess  mpg weight
```



Notice our use of `mcolor(*.6)` to dim the points and thus make the lines stand out; see [G-4] [colorstyle](#).

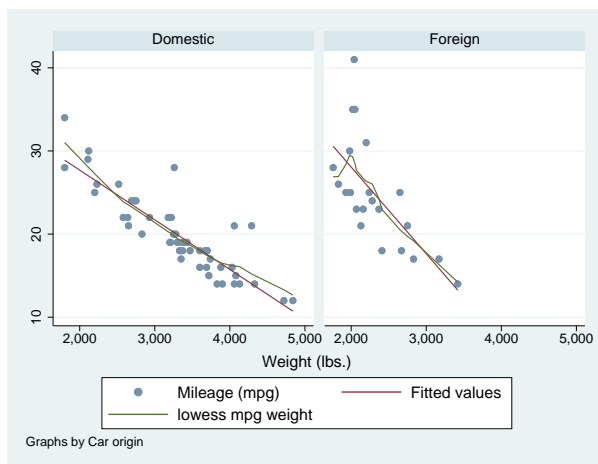
## Use with by()

`graph twoway lowess` may be used with `by()`:

```

. use https://www.stata-press.com/data/r17/auto, clear
(1978 automobile data)
. twoway scatter mpg weight, mcolor(*.6) ||
    lfit    mpg weight ||
    lowess  mpg weight ||, by(foreign)

```



## References

- Cleveland, W. S. 1979. Robust locally weighted regression and smoothing scatterplots. *Journal of the American Statistical Association* 74: 829–836. <https://doi.org/10.2307/2286407>.
- Cox, N. J. 2005. *Speaking Stata: Smoothing in various directions*. *Stata Journal* 5: 574–593.
- . 2010. *Software Updates: Speaking Stata: Smoothing in various directions*. *Stata Journal* 10: 164.
- Royston, P., and N. J. Cox. 2005. *A multivariable scatterplot smoother*. *Stata Journal* 5: 405–412.

## Also see

[R] **lowess** — Lowess smoothing

[G-2] **graph twoway mspline** — Twoway median-spline plots