

graph twoway lpoly — Local polynomial smooth plots

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Syntax

```
twoway lpoly yvar xvar [if] [in] [weight] [, options]
```

<i>options</i>	Description
<u>k</u> er <u>n</u> e <u>l</u> (<i>kernel</i>)	kernel function; default is <code>kernel(epanechnikov)</code>
<u>b</u> width(<i>#</i>)	kernel bandwidth
<u>d</u> e <u>g</u> ree(<i>#</i>)	degree of the polynomial smooth; default is <code>degree(0)</code>
<u>n</u> (<i>#</i>)	obtain the smooth at <i>#</i> points; default is <code>min(N, 50)</code>
<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.

See [\[G-3\] *cline_options*](#), [\[G-3\] *axis_choice_options*](#), and [\[G-3\] *twoway_options*](#).

<i>kernel</i>	Description
<u>e</u> panechnikov	Epanechnikov kernel function; the default
<u>e</u> pan2	alternative Epanechnikov kernel function
<u>b</u> iweight	biweight kernel function
<u>c</u> osine	cosine trace kernel function
<u>g</u> aussian	Gaussian kernel function
<u>p</u> arzen	Parzen kernel function
<u>r</u> ectangle	rectangle kernel function
<u>t</u> riangle	triangle kernel function

`fweights` and `awweights` are allowed; see [\[U\] 11.1.6 weight](#).

Menu

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

Description

`graph twoway lpoly` plots a local polynomial smooth of *yvar* on *xvar*.

Options

`kernel(kernel)` specifies the kernel function for use in calculating the weighted local polynomial estimate. The default is `kernel(epanechnikov)`. See [R] [kdensity](#) for more information on this option.

`bwidth(#)` specifies the half-width of the kernel, the width of the smoothing window around each point. If `bwidth()` is not specified, a rule-of-thumb bandwidth estimator is calculated and used; see [R] [lpoly](#).

`degree(#)` specifies the degree of the polynomial to be used in the smoothing. The default is `degree(0)`, meaning local mean smoothing.

`n(#)` specifies the number of points at which the smooth is to be calculated. The default is $\min(N, 50)$, where N is the number of observations.

cline_options specify how the 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](http://www.stata.com)

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

Remarks are presented under the following headings:

Typical use

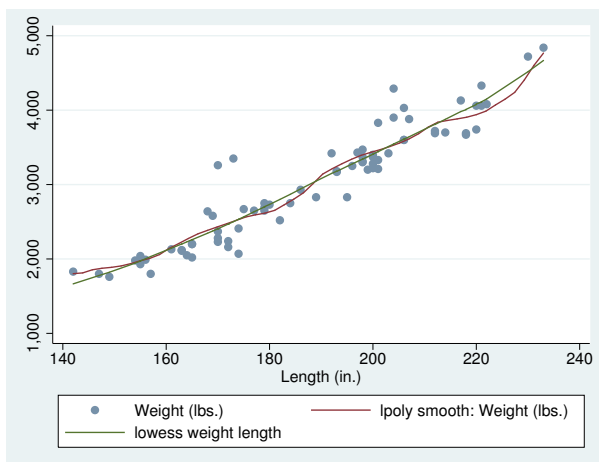
Use with by()

Typical use

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

```
. use http://www.stata-press.com/data/r13/auto
(1978 Automobile Data)

. twoway scatter weight length, mcolor(*.6) ||
  lpoly weight length           ||
  lowess weight length
```



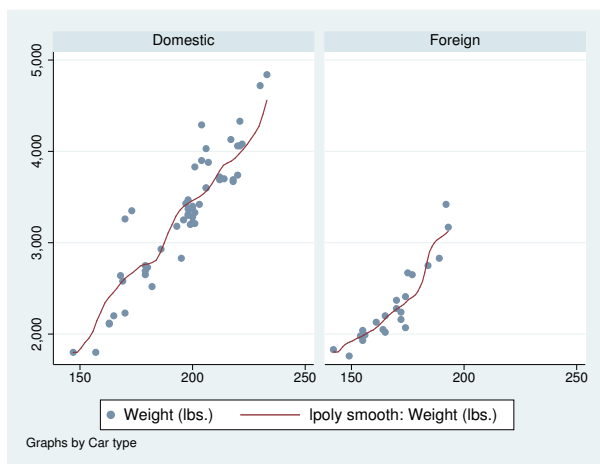
We used `mcolor(*.6)` to dim the points and thus make the lines stand out; see [\[G-4\] *colorstyle*](#).

Notice the *y*-axis title: “Mileage (mpg)/lpoly smooth: Mileage (mpg)/lowess mpg weight”. The “lpoly smooth: Mileage (mpg)” was contributed by `twoway lpoly` and “lowess mpg weight” by `twoway lowess`. When you overlay graphs, you nearly always need to respecify the axis titles by using the *axis_title_options* `ytitle()` and `xtitle()`; see [\[G-3\] *axis_title_options*](#).

Use with by()

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

```
. use http://www.stata-press.com/data/r13/auto, clear
(1978 Automobile Data)
. twoway scatter weight length, mcolor(*.6) ||
    lpoly weight length, ||
    , by(foreign)
```

**References**

- 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.

Also see

- [R] **lpoly** — Kernel-weighted local polynomial smoothing
- [G-2] **graph twoway lpolyci** — Local polynomial smooth plots with CIs