graph twoway lpoly — Local polynomial smooth plots

Description

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

Quick start

Kernel-weighted local polynomial smooth plot of `y` versus `x` with local mean smoothing

```
twoway lpoly y x
```

Same as above, and overlay on a scatterplot to show the observed data

```
twoway scatter y x || lpoly y x
```

Same as above, but with gray markers and a navy blue line

```
twoway scatter y x, mcolor(gray) || lpoly y x, lcolor(navy)
```

Specify the half-width of the kernel to be 110

```
twoway scatter y x || lpoly y x, bwidth(110)
```

Specify a polynomial of degree 3

```
twoway scatter y x || lpoly y x, degree(3)
```

Specify the triangle kernel function

```
twoway scatter y x || lpoly y x, kernel(triangle)
```

Show both the triangle and default Epanechnikov kernel functions

```
twoway scatter y x || lpoly y x, kernel(triangle) || lpoly y x
```

With a separate graph area for each level of categorical variable `catvar`

```
twoway scatter y x || lpoly y x , by(catvar)
```

Menu

Graphics > Two-way graph (scatter, line, etc.)

Syntax

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

options	Description
kernel(*kernel*)	kernel function; default is kernel(epanechnikov)
bwidth(#)	kernel bandwidth
degree(#)	degree of the polynomial smooth; default is degree(0)
n(#)	obtain the smooth at # points; default is min(N, 50)
cline_options	change look of the line
axis_choice_options	associate plot with alternative axis
twoway_options	titles, legends, axes, added lines and text, by, regions, name, aspect ratio, etc.

kernel	Description
epanechnikov	Epanechnikov kernel function; the default
epan2	alternative Epanechnikov kernel function
biweight	biweight kernel function
cosine	cosine trace kernel function
gaussian	Gaussian kernel function
parzen	Parzen kernel function
rectangle	rectangle kernel function
triangle	triangle kernel function

fweights and aweights are allowed; see **[U] 11.1.6 weight**.

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

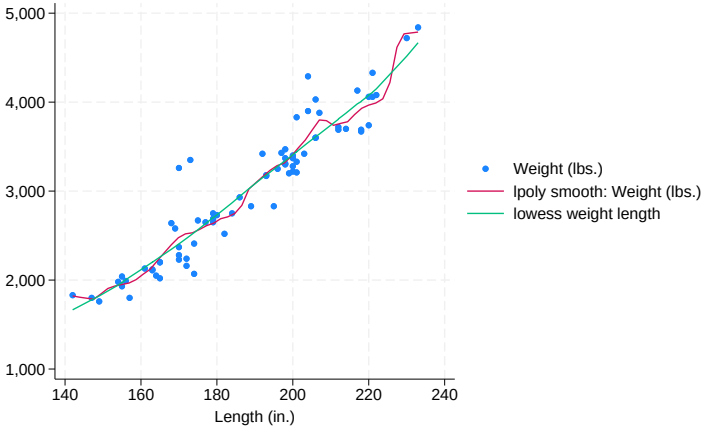
`graph twoway lpoly` *yvar xvar* uses the `lpoly` command—see [R] **lpoly**—to obtain a local polynomial smooth of *yvar* on *xvar* and uses `graph twoway line` to plot the result.

Remarks are presented under the following headings:

Typical use

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

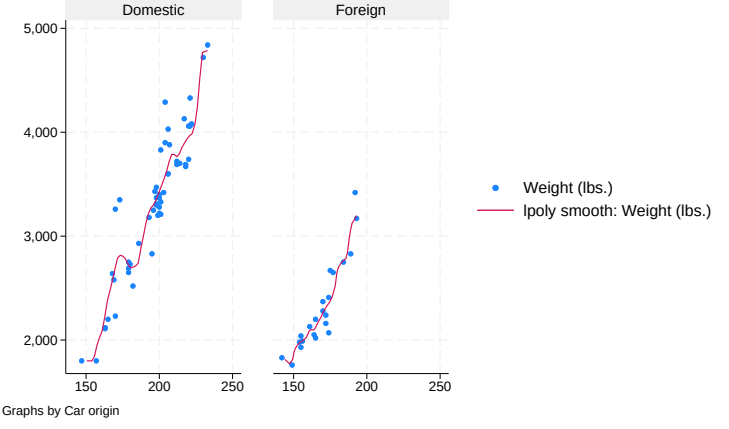
```
. use https://www.stata-press.com/data/r19/auto
(1978 automobile data)
. twoway scatter weight length     ||
         lpoly weight length       ||
         lowess weight length
```



Use with by()

graph twoway lpoly may be used with by():

```
. use https://www.stata-press.com/data/r19/auto, clear
(1978 automobile data)
. twoway scatter weight length     ||
          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