**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
```

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

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

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

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

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<th>options</th>
<th>Description</th>
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<tbody>
<tr>
<td><code>kernel(kernel)</code></td>
<td>kernel function; default is <code>kernel(epanechnikov)</code></td>
</tr>
<tr>
<td><code>bwidth(#)</code></td>
<td>kernel bandwidth</td>
</tr>
<tr>
<td><code>degree(#)</code></td>
<td>degree of the polynomial smooth; default is <code>degree(0)</code></td>
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<tr>
<td><code>n(#)</code></td>
<td>obtain the smooth at # points; default is <code>min(N,50)</code></td>
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</table>

`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.

<table>
<thead>
<tr>
<th>kernel</th>
<th>Description</th>
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<tr>
<td><code>epanechnikov</code></td>
<td>Epanechnikov kernel function; the default</td>
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<td><code>epan2</code></td>
<td>alternative Epanechnikov kernel function</td>
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<td>Parzen kernel function</td>
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<tr>
<td><code>rectangle</code></td>
<td>rectangle kernel function</td>
</tr>
<tr>
<td><code>triangle</code></td>
<td>triangle kernel function</td>
</tr>
</tbody>
</table>

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
- Use with `by()`

**Typical use**

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

```stata
. use https://www.stata-press.com/data/r16/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`. 
Use with by()

graph twoway lpoly may be used with by():

. use https://www.stata-press.com/data/r16/auto, clear
   (1978 Automobile Data)
. twoway scatter weight length, mcolor(*.6) ||
    lpoly weight length, ||
    , by(foreign)

References


Also see

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