**Graph combine — Combine multiple graphs**

### Syntax

```
_graph combine name [ name ... ] [ , options ]
```

<table>
<thead>
<tr>
<th>name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>name</code></td>
<td>name of graph in memory</td>
</tr>
<tr>
<td><code>name.gph</code></td>
<td>name of graph stored on disk</td>
</tr>
<tr>
<td>&quot;name&quot;</td>
<td>name of graph stored on disk</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>colfirst</code></td>
<td>display down columns</td>
</tr>
<tr>
<td><code>rows(#)</code> <code>cols(#)</code></td>
<td>display in # rows or # columns</td>
</tr>
<tr>
<td><code>holes(numlist)</code></td>
<td>positions to leave blank</td>
</tr>
<tr>
<td><code>iscale([ * ] #)</code></td>
<td>size of text and markers</td>
</tr>
<tr>
<td><code>altshrink</code></td>
<td>alternate scaling of text, etc.</td>
</tr>
<tr>
<td><code>imargin(marginstyle)</code></td>
<td>margins for individual graphs</td>
</tr>
<tr>
<td><code>ycommon</code></td>
<td>give y axes common scales</td>
</tr>
<tr>
<td><code>xcommon</code></td>
<td>give x axes common scales</td>
</tr>
<tr>
<td><code>title_options</code></td>
<td>titles to appear on combined graph</td>
</tr>
<tr>
<td><code>region_options</code></td>
<td>outlining, shading, aspect ratio</td>
</tr>
<tr>
<td><code>commonscheme</code></td>
<td>put graphs on common scheme</td>
</tr>
<tr>
<td><code>scheme(schemename)</code></td>
<td>overall look</td>
</tr>
<tr>
<td><code>nodraw</code></td>
<td>suppress display of combined graph</td>
</tr>
<tr>
<td><code>name(name, ...)</code></td>
<td>specify name for combined graph</td>
</tr>
<tr>
<td><code>saving(filename, ...)</code></td>
<td>save combined graph in file</td>
</tr>
</tbody>
</table>


### Description

`graph combine` arrays separately drawn graphs into one.
Options

colfirst, rows(#), cols(#), and holes(numlist) specify how the resulting graphs are arrayed.
These are the same options described in [G-3] by_option.

iscale(#) and iscale(*#) specify a size adjustment (multiplier) to be used to scale the text and markers used in the individual graphs.

By default, iscale() gets smaller and smaller the larger is \( G \), the number of graphs being combined. The default is parameterized as a multiplier \( f(G) = 0 < f(G) < 1, f'(G) < 0 \)—that is used to multiply msize(, {y|x}label(, labsize())), etc., in the individual graphs.

If you specify iscale(#), the number you specify is substituted for \( f(G) \). iscale(1) means that text and markers should appear the same size that they were originally. iscale(.5) displays text and markers at half that size. We recommend that you specify a number between 0 and 1, but you are free to specify numbers larger than 1.

If you specify iscale(*#), the number you specify is multiplied by \( f(G) \), and that product is used to scale the text and markers. iscale(*1) is the default. iscale(*1.2) means that text and markers should appear at 20% larger than graph combine would ordinarily choose. iscale(*.8) would make them 20% smaller.

altshrink specifies an alternate method of determining the size of text, markers, line thicknesses, and line patterns. The size of everything drawn on each graph is as though the graph were drawn at full size, but at the aspect ratio of the combined individual graph, and then the individual graph and everything on it were shrunk to the size shown in the combined graph.

imargin(marginstyle) specifies margins to be put around the individual graphs. See [G-4] marginstyle.

ycommon and xcommon specify that the individual graphs previously drawn by graph twoway, and for which the by() option was not specified, be put on common y or x axis scales. See Combining twoway graphs under Remarks and examples below.

These options have no effect when applied to the categorical axes of bar, box, and dot graphs. Also, when twoway graphs are combined with bar, box, and dot graphs, the options affect only those graphs of the same type as the first graph combined.

title_options allow you to specify titles, subtitles, notes, and captions to be placed on the combined graph; see [G-3] title_options.

region_options allow you to control the aspect ratio, size, etc., of the combined graph; see [G-3] region_options. Important among these options are ysize(#) and xsize(#), which specify the overall size of the resulting graph. It is sometimes desirable to make the combined graph wider or longer than usual.

commonscheme and scheme(schemename) are for use when combining graphs that use different schemes. By default, each subgraph will be drawn according to its own scheme.

commonscheme specifies that all subgraphs be drawn using the same scheme and, by default, that scheme will be your default scheme; see [G-4] schemes intro.

scheme(schemename) specifies that the schemename be used instead; see [G-3] scheme_option.

nodraw causes the combined graph to be constructed but not displayed; see [G-3] nodraw_option.

name(name[, replace]) specifies the name of the resulting combined graph. name(Graph, replace) is the default. See [G-3] name_option.

saving(filename[, asis replace]) specifies that the combined graph be saved as filename. If filename is specified without an extension, .gph is assumed. asis specifies that the graph be
saved in as-is format. \texttt{replace} specifies that, if the file already exists, it is okay to replace it. See \cite{G-3} \texttt{saving_option}.

**Remarks and examples**

Remarks are presented under the following headings:

- Typical use
- Typical use with memory graphs
- Combining twoway graphs
- Advanced use
- Controlling the aspect ratio of subgraphs

**Typical use**

We have previously drawn

```
. use http://www.stata-press.com/data/r13/uslifeexp
   (U.S. life expectancy, 1900-1999)
. line le_male year, saving(male)
. line le_female year, saving(female)
```

We now wish to combine these two graphs:

```
. gr combine male.gph female.gph
```

This graph would look better combined into one column and if we specified \texttt{iscale(1)} to prevent the font from shrinking:
Typical use with memory graphs

In both the above examples, we explicitly typed the .gph suffix on the ends of the filenames:

```
. gr combine male.gph female.gph
. gr combine male.gph female.gph, col(1) iscale(1)
```

We must do that, or we must enclose the filenames in quotes:

```
. gr combine "male" "female"
. gr combine "male" "female", col(1) iscale(1)
```

If we did neither, `graph combine` would assume that the graphs were stored in memory and would then have issued the error that the graphs could not be found. Had we wanted to do these examples by using memory graphs rather than disk files, we could have substituted `name()` for saving on the individual graphs

```
. use http://www.stata-press.com/data/r13/uslifeexp, clear
     (U.S. life expectancy, 1990-1999)
. line le_male year, name(male)
. line le_female year, name(female)
```

and then we could type the names without quotes on the `graph combine` commands:

```
. gr combine male female
. gr combine male female, col(1) iscale(1)
```

Combining twoway graphs

In the first example of Typical use, the $y$ axis of the two graphs did not align: one had a minimum of 40, whereas the other was approximately 37. Option `ycommon` will put all `twoway` graphs on a common $y$ scale.

```
. gr combine male.gph female.gph, col(1) iscale(1)
```
. line le_male year, saving(male)
. line le_female year, saving(female)
. gr combine male.gph female.gph, ycommon

Advanced use

. generate loggnp = log10(gnppc)
   (5 missing values generated)
. label var loggnp "Log base 10 of GNP per capita"
. scatter lexp loggnp, 
   ysca(alt) xsca(alt)
   xlabel(, grid gmax) saving(yx)
. twoway histogram lexp, fraction
   xsca(alt reverse) horiz saving(hy)
. twoway histogram loggnp, fraction
   ysca(alt reverse)
   ylabel(,nogrid)
   xlabel(,grid gmax) saving(hx)
. graph combine hy.gph yx.gph hx.gph, 
   hole(3)
   imargin(0 0 0 0) graphregion(margin(l=22 r=22))
   title("Life expectancy at birth vs. GNP per capita")
   note("Source: 1998 data from The World Bank Group")
Note the specification of
\[ \text{imargin}(0 0 0 0) \text{ graphregion(margin(1=22 r=22))} \]
on the graph combine statement. Specifying \text{imargin()} pushes the graphs together by eliminating the margins around them. Specifying \text{graphregion(margin())} makes the graphs more square—to control the aspect ratio.

### Controlling the aspect ratio of subgraphs

The above graph can be converted to look like this

by adding \text{fysize(25)} to the drawing of the histogram for the \text{x} axis,

\[
\text{. twoway histogram loggnp, fraction}
\text{   yscale(alt reverse)}
\text{   ylabel(0(.1).2, nogrid)}
\text{   xlabel(, grid gmax)   saving(hx)}
\text{   fysize(25)} \quad \leftarrow \text{new}
\]
and adding `fxsize(25)` to the drawing of the histogram for the $y$ axis:

```
. twoway histogram lexp, fraction
   x sca(alt reverse) horiz saving(hy)
   fxsize(25)
```

The `graph combine` command remained unchanged.

The `forced_size_options` `fysize()` and `fxsize()` are allowed with any graph, their syntax being

<table>
<thead>
<tr>
<th><code>forced_size_options</code></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>fysize(relativesize)</code></td>
<td>use only percent of height available</td>
</tr>
<tr>
<td><code>fxsize(relativesize)</code></td>
<td>use only percent of width available</td>
</tr>
</tbody>
</table>


There are three ways to control the aspect ratio of a graph:

1. Specify the `region_options` `ysize(#)` and `xsize(#)`; # is specified in inches.
2. Specify the `region_option` `graphregion(margin(marginstyle))`.
3. Specify the `forced_size_options` `fysize(relativesize)` and `fxsize(relativesize)`.

Now let us distinguish between

a. controlling the aspect ratio of the overall graph, and
b. controlling the aspect ratio of individual graphs in a combined graph.

For problem (a), methods (1) and (2) are best. We used method (2) when we constructed the overall combined graph above—we specified `graphregion(margin(l=22 r=22))`. Methods 1 and 2 are discussed under `Controlling the aspect ratio` in [G-3] `region_options`.

For problem (b), method (1) will not work, and methods (2) and (3) do different things.

Method (1) controls the physical size at which the graph appears, so it indirectly controls the aspect ratio. `graph combine`, however, discards this physical-size information.

Method (2) is one way of controlling the aspect ratio of subgraphs. `graph combine` honors margins, assuming that you do not specify `graph combine`'s `imargin()` option, which overrides the original margin information. In any case, if you want the subgraph long and narrow, or short and wide, you need only specify the appropriate `graphregion(margin())` at the time you draw the subgraph. When you combine the resulting graph with other graphs, it will look exactly as you want it. The long-and-narrow or short-and-wide graph will appear in the array adjacent to all the other graphs. Each graph is allocated an equal-sized area in the array, and the oddly shaped graph is drawn into it.

Method (3) is the only way you can obtain unequally sized areas. For the combined graph above, you specified `graph combine`'s `imargin()` option and that alone precluded our use of method (2), but most importantly, you did not want an array of four equally sized areas:
We wanted

The \texttt{forced-size-options} allowed us to achieve that. You specify the \texttt{forced-size-options} \texttt{fysize()} and \texttt{fxsize()} with the commands that draw the subgraphs, not with \texttt{graph combine}. Inside the parentheses, you specify the percentage of the graph region to be used. Although you could use \texttt{fysize()} and \texttt{fxsize()} to control the aspect ratio in ordinary cases, there is no reason to do that. Use \texttt{fysize()} and \texttt{fxsize()} to control the aspect ratio when you are going to use \texttt{graph combine} and you want unequally sized areas or when you will be specifying \texttt{graph combine’s imargin()} option.

Reference


Also see

[G-2] \texttt{graph use} — Display graph stored on disk
[G-2] \texttt{graph save} — Save graph to disk
[G-3] \textit{saving_option} — Option for saving graph to disk
[G-4] \texttt{concept: gph files} — Using gph files