The LaTeX keyfloat Package

Abstract

The keyfloat package provides a key/value user interface for quickly creating figures with a single image each, figures with arbitrary contents, tables, subfloats, rows of floats, floats located [H]ere, floats in the [M]argin, and floats with text [W]rapped around them.

Key/value combinations may specify a caption and label, a width proportional to \linewidth, a fixed width and/or height, rotation, scaling, a tight or loose frame, an \arraystretch, a continued float, additional supplemental text, and an artist/author's name with automatic index entry. When used with the tocdata package, the name also appears in the List of Figures.

Floats may be moved into or rearranged inside a multi-row environment or subfloats, and are typeset to fit within the given number of columns, continuing to additional rows as necessary. Nested sub-rows may be used to generate layouts such as two small figures placed vertically next to one larger figure.

As an example, a typical command to include a figure with a framed image of half \linewidth could be:

\keyfig*[hbp]{f, lw=.5, c={A caption}, l={fig:label}}{image}

keyfloat uses the caption, subcaption, newfloat or float, and wrapfig packages, and cannot be used with the subfig, subfigure, subfloat, floatrow, or floatflt packages.

See the General Index for an index of topics and troubleshooting.

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1 Introduction

The keyfloat package simplifies the creation of \LaTeX floats, while still allowing a large number of useful features.

1.1 A problem with floats

When including a figure with a graphics image into a document, the user typically enters something such as:

\begin{figure}
  \centering
  \includegraphics[width=3in]{filename}
  \caption{A Figure}
  \label{fig:somelabel}
\end{figure}

When doing that often enough, it makes sense to factor the common code:

\onefigure[3in]{filename}{A Figure}{fig:somelabel}

Expanding the capability of \onefigure via \texttt{xparse} can lead to the general case of:

\onefigure*[loc](width){filename}{add'1 text}[shortcap]{caption}*[label]

Attempting to add additional features such as frames and continued floats hits the limit of nine parameters for a \TeX macro, requiring that new features use some kind of change-state macros instead. Attempting to support rows of floats or subfloats only makes things more complicated still.

A key/value system solves the problem of adding more features, does not require much additional typing, is a more self-documenting syntax, and allows a shared syntax with subfloats and groups of floats as well. Thus, the keyfloat package.

1.2 The keyfloat package

Using keyfloat, the previous example becomes:

\keyfig{w=3in,c=A figure,l=fig:somelabel}{filename}

The \texttt{onefigure} general case becomes:

\keyfig*[loc]{w=width,t={add'1 text},sc=shortcap,cstar=caption, l=label}{filename}
1.3 Features

The macros and environments provided by \keyfloat\ include:

\keyfig: A figure with an image.
\keytab: A table.
\keyflt: An arbitrary float type macro.
\keyfigbox: A figure with arbitrary contents.
\keyparbox: A “figure” without a caption, useful to place uncaptioned text inside a group.
\keyfigure: A figure environment.
\keytable: A table environment.
\keyfloat: An arbitrary float type environment.
\keyfloats: A group of rows and columns of floats.
\keysfigs: A figure containing a group of rows and columns of subfigures.
\keyssubtabs: A table containing a group of rows and columns of subtables.
\keyssubfloats: A float of arbitrary type containing a group of rows and columns of subfloats.
\keywrap: Wraps a keyfloat around an environment of text. Usable inside a list.
\margfigure: A figure environment placed into the margin.\footnote{\margfigure and \margtable: The environments provided by the \texttt{tufte-book} class are used if loaded, otherwise \keyfloat\ provides its own versions.}
\margtable: A table environment placed in the margin.

Additional features include:

- Rows and columns of floats may be generated by placing them inside a keyfloats environment.
- Subfloats may be generated by placing them inside a keysfigs or keyssubtabs environment.
- Dynamic layout: The number of columns is specified. Extra floats are placed onto additional rows as needed, with the final row adjusted to compensate for leftovers.
• Floats may be placed \[H]ere.
• Floats may be placed in the \[M]argin.
• Floats may be placed with text \[W]rapped around them.
• Floats may be starred to span two columns.
• Continued floats may be used to repeat the previous float number.
• A figure may contain an image, with additional sizing, rotation, and a frame.
• Tables may be stretched. (\texttt{arraystretch})
• Boxes of arbitrary contents may be assigned a width and framed.
• Floats may be moved into and out of the grouping environments as needed.
• An artist/author’s name may be added to a figure and the index.
• If the \texttt{tocdata} package is loaded (use v0.12+), the name is also added to the \texttt{LOF}.
• Additional descriptive text may be added as well.
• Frames may be customized.

\section*{examples}
A large number of examples are provided, each showing \LaTeX{} source and the resulting float.

\section*{index}
A customized index is included at the back of the documentation, including troubleshooting issues.

\section*{margin tags}
Blue margin tags are used to help quickly find information, and often indicate the destination of index entries.

\section*{warnings}
Several warnings are noted in the text. Watch out for these special cases.

\section*{1.4 Updates}
Recent changes include the following:

\textbf{v2.06}: Added shared keys for groups of floats or subfloats. Added the \texttt{kar} key to keep the aspect ratio of an image. Removed : for an empty caption. Warns if an image is too wide to fit.

\textbf{v2.02, v2.04}: Added keys for wrapped floats.
1.5 Other float-related packages

Several other \LaTeX{} packages related to floats include:

* **caption** and **subcaption**: Improved control over captions.
* **floatrow**: A macro-based package for creating floats; including captions, footnotes, and rows of floats.
* **hvfloat**: A key/value system allowing the easy rotation of captions and floats.
* **nccfloats**: Macros for minipage floats and side-by-side floats.
* **newfloat**: Macros for the creation of float environments.
* **rotfloat**: Environments for rotated floats.
* **subfig**: Macros to add subfloats inside a float.
2 Using the keyfloat package

2.1 Loading keyfloat and related packages

keyfloat is loaded with the usual command:

\usepackage{keyfloat}

If you wish to have artists' names appear in the list of figures, as provided by the tocdata package, load tocdata, optionally followed by either tocloft or titletoc, then keyfloat:

\usepackage{tocdata}
\usepackage{titletoc}% or titletoc, or neither
\usepackage{keyfloat}

To use custom float types with the float package:

\usepackage{float}
\newfloat{diagram}{htb}{lod}

To use custom float types with the newfloat package:

\usepackage{newfloat}
\DeclareFloatingEnvironment[
  fileext={lod},
  listname={List of Diagrams},
  name={Diagram},
]{diagram}

For the caption package, to have table captions appear above the tables, and to use custom float types:

\usepackage[tableposition=top]{caption}
\captionsetup[diagram]{
  style=default, justification=centering,
  margin=0pt, parskip=0pt, skip=1ex,
  labelfont={small,bf},textfont={small,bf}
}

To use custom float and subfloat types with cleveref:

\usepackage{cleveref}
\crefname{diagram}{diagram}{diagrams}
\crefname{subdiagram}{subdiagram}{subdiagrams}
2.2 Macros and environments

\keyfig * [⟨loc⟩] {⟨keys/values⟩} {⟨image filename⟩}
A macro to generate a figure with an image from a file.

\keytab * [⟨loc⟩] {⟨keys/values⟩} {⟨tabular contents⟩}
A macro to generate a table with tabular contents. Usually use the keytable environment instead.

\keyflt * [⟨loc⟩] {⟨float type⟩} {⟨keys/values⟩} {⟨contents⟩}
A macro to generate an arbitrary float type with its contents.

\keyfigbox * [⟨loc⟩] {⟨keys/values⟩} {⟨box contents⟩}
A macro to generate a figure with arbitrary paragraph contents. See example 2.

\keyparbox * [⟨loc⟩] {⟨keys/values⟩} {⟨box contents⟩}
A macro to generate a figure with arbitrary paragraph contents, but no number or caption. This is equal to a \keyfigbox with cstar={}. Mostly useful to add supplemental information inside a row of floats or subfloats. See example 14.

Env keyfigure * [⟨loc⟩] {⟨keys/values⟩}
An environment to generate a figure with arbitrary contents. Useful for multi-paragraph contents. See example 3.

Env keytable * [⟨loc⟩] {⟨keys/values⟩}
An environment to generate a table with arbitrary contents. Useful for larger tables. See example 5.

Env keyfloat * [⟨loc⟩] {⟨float type⟩} {⟨keys/values⟩}
An environment to generate an arbitrary float type with its contents. Useful for multi-paragraph contents.

The above macros and environments may be used by themselves, or inside the following keyfloats, keysubfigs, or keysubtabs environments.

Env keyfloats * [⟨loc⟩] {⟨num columns⟩} {⟨shared keys/values⟩}
A group of figures or tables typeset in rows. May be nested, [H], [W], or [M]. The optional shared keys/values are passed to each object within. See example 15.

Env keysubfigs * [⟨loc⟩] {⟨numcols⟩} {⟨keys⟩} {⟨shared keys/values⟩}
A group of subfigures typeset in rows. May not be nested. May be [H], [W], or [M]. The optional shared keys/values are passed to each object within. See example 16.
Env keysubtabs * | ⟨loc⟩ | ⟨numcols⟩ | ⟨keys⟩ | [shared keys/values] |
A group of subtables typeset in rows. May not be nested. May be [H], [W], or [M]. The optional shared keys/values are passed to each object within. See example 17.

Env keysubfloats * | ⟨loc⟩ | ⟨float type⟩ | ⟨numcols⟩ | ⟨keys⟩ | [shared keys/values] |
A group of subfloats typeset in rows. May not be nested. May be [H], [W], or [M]. The optional shared keys/values are passed to each object within.

Env keywrap ⟨width of keyfloat⟩ | ⟨keyfloat⟩ |
Displays a keyfloat next to an environment of text. Two minipages are used side-by-side, which allows its use inside a list item where [W] will not work, but extra empty vertical space will appear if the keyfloat and the text are of unequal vertical size. ⟨keyfloat⟩ may be any of \keyfig, keyfigure, keyfloats, keysubfigs, etc., each with its proper arguments. See example 27.

Env marginfigure ⟨offset⟩ |
A figure placed into the margin, with an optional vertical offset. \keyfloat uses the version provided by the tufte-book class if available, or provides its own version otherwise. See example 20.

Env margintable ⟨offset⟩ |
A table placed into the margin, with an optional vertical offset. \keyfloat uses the version provided by the tufte-book class if available, or provides its own version otherwise. See example 21.

Arg * The star option create floats which span both columns in a two-column document.

Arg [H] The [H] location forces a figure to be “Here”, in the form of a minipage instead of a float. A caption, label, etc. may still be assigned.

Arg [M] The [M] location places the float into the margin. When the tufte-book class is used, its marginfigure and margintable environments are used, otherwise keyfloat provides and uses its own versions of the same environments. See examples 22 and 23.

Arg [W] The [W] location wraps text around the float. Use this just before the start of a paragraph with contents large enough to wrap around the float. Do not use this inside a list environment. Select placement with the wp key; see the wrapfig package documentation for more information. Use w or lw to set the width of the item/image contained inside the wrap area. By default the caption will also be contained in this width. To use a larger width for the overall container and caption, set w or lw for the size of the image, and also use ww or lw for a larger size for the caption. Watch the log for warnings from wrapfig.

△ wrapfig warnings

Arg [loc] The star and [loc] options are ignored for floats inside a keyfloats, keysubfigs, or keysubtabs environment. Note that these container environments may have their own star and [loc] options.
2.3 Keys and values

Table 1 shows the key/value combinations which are allowed. In most cases these may be used in any order and any combination, except for the following:

- **subfloat keys**
  The keys labeled "Sub" may be used for the `keysubfigs` and `keysubtabs` environments, which group a number of subfloats together under one master float. The master float has its own caption, label, and text, and each subfloat inside the group likewise has its own set of keys.

- **keyfloats**
  `keyfloats` does not accept any keys at all.

- **keyfloats keys**
  The “artist” keys `ap`, `af`, `al`, and `as` are only used by figures.

- **stretch key**
  The `stretch` key increases space between tabular elements.

- **keyfloats keys**
  The rest of the macros and environments accept all of the keys, as they each create an individual float or subfloat, and each may have its own assigned dimensions and frame.

- **short/long caption combinations**
  Table 2 shows the combinations of the caption-related keys `c`, `cstar`, and `sc`, and how they control the caption numbering and entries in the `LOF/LOT`.

- **wrapped float placement**
  Table 3 shows the wrapped-float placement options for the `wp` key for floats placed `[W]`.

...
## Table 1: Keys and values — part I

<table>
<thead>
<tr>
<th>Key</th>
<th>Sub&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>c</td>
<td></td>
<td>An unstared caption. If empty, creates a figure with a number but no caption.</td>
<td>c={A caption}</td>
</tr>
<tr>
<td>cstar</td>
<td></td>
<td>A starred caption. Creates a float without a number. If empty, creates a figure with no number or caption.</td>
<td>cstar={No Num}</td>
</tr>
<tr>
<td>sc</td>
<td></td>
<td>The short caption for the LOF/LOT, even if cstar.</td>
<td>sc={Short cap}</td>
</tr>
<tr>
<td>cont</td>
<td></td>
<td>Continued float?</td>
<td>cont</td>
</tr>
<tr>
<td>l</td>
<td></td>
<td>The label. Enclose in braces if a comma is included. Ignored in unnumbered floats.</td>
<td>l=fig:alabel</td>
</tr>
<tr>
<td>ap, aup</td>
<td></td>
<td>Artist/author's prefix, such as “Mr.”&lt;sup&gt;b&lt;/sup&gt;</td>
<td>ap=Mr.</td>
</tr>
<tr>
<td>af, auf</td>
<td></td>
<td>Artist/author's first name.&lt;sup&gt;b&lt;/sup&gt;</td>
<td>af=First</td>
</tr>
<tr>
<td>al, aul</td>
<td></td>
<td>Artist/author's last name.&lt;sup&gt;b&lt;/sup&gt;</td>
<td>al=Last</td>
</tr>
<tr>
<td>as, aus</td>
<td></td>
<td>Artist/author's suffix, such as ~III.&lt;sup&gt;b&lt;/sup&gt;</td>
<td>al=III</td>
</tr>
<tr>
<td>t</td>
<td></td>
<td>Additional text. May include paragraphs. Enclose in braces if a comma is included. May need \protect before macro calls. Fully-justified alignment.</td>
<td>t={Paragraphs}</td>
</tr>
<tr>
<td>tc</td>
<td></td>
<td>Additional text, aligned to the center.</td>
<td>tc={Paragraphs}</td>
</tr>
<tr>
<td>tl</td>
<td></td>
<td>Additional text, aligned to the left.</td>
<td>tl={Paragraphs}</td>
</tr>
<tr>
<td>tr</td>
<td></td>
<td>Additional text, aligned to the right.</td>
<td>tr={Paragraphs}</td>
</tr>
</tbody>
</table>

<sup>a</sup> All the keys in Part I may be used with the main keys of the keysubfigs, keysubtabs, and keysubfloats environments.

<sup>b</sup> Artist/author keys: al is an artist's last name, aul is an author's last name, etc. Artists names are printed centered, authors are flush right. A fixed-width non-breakable space is placed between parts of names, except that the optional suffix is connected directly to the last name, allowing “as={, Title}”, for example.

... continued
Table 1: Keys and values — part II

<table>
<thead>
<tr>
<th>Key</th>
<th>Sub&lt;sup&gt;c&lt;/sup&gt;</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>lw</td>
<td>—</td>
<td>Set the width to a fraction of \textwidth. Cancels w. If a non-image float, sets the width of the text box. For wrapped objects, may be used with wlw for a smaller item with a larger caption.</td>
<td>lw=.5</td>
</tr>
<tr>
<td>w</td>
<td>—</td>
<td>Set the actual width. Cancels lw. If a non-image float, sets the width of the text box. For wrapped objects, may be used with ws for a smaller item with a larger caption.</td>
<td>w=2in</td>
</tr>
<tr>
<td>h</td>
<td>—</td>
<td>Set the actual height. Images only.</td>
<td>w=2in</td>
</tr>
<tr>
<td>kar</td>
<td>—</td>
<td>Keep aspect ratio: Use with w or lw, along with h, to fit an image into a given area. Images only.</td>
<td>kar</td>
</tr>
<tr>
<td>s</td>
<td>—</td>
<td>Set the image scale. Images only.</td>
<td>s=3</td>
</tr>
<tr>
<td>r</td>
<td>—</td>
<td>Set the rotation angle; counter-clockwise degrees.</td>
<td>r=90</td>
</tr>
<tr>
<td>f</td>
<td>—</td>
<td>Selects a loose frame with the current \fboxsep. Only rotated with \keyfig.</td>
<td>f</td>
</tr>
<tr>
<td>ft</td>
<td>—</td>
<td>Selects a tight frame with no \fboxsep. Useful for photographs, or diagrams which already have some margin built in.</td>
<td>ft</td>
</tr>
<tr>
<td>stretch</td>
<td>—</td>
<td>Sets \arraystretch inside the float.</td>
<td>stretch=1.5</td>
</tr>
<tr>
<td>mo</td>
<td>—</td>
<td>Sets the vertical offset for a margin float.</td>
<td>mo=-1.2ex</td>
</tr>
<tr>
<td>wn</td>
<td>—</td>
<td>Sets the number of lines for a wrapped float.</td>
<td>wn=2</td>
</tr>
<tr>
<td>wp</td>
<td>—</td>
<td>Sets the wrap placement for a wrapped float. The default is 0, which places the wrapped float at the outside edge of the text. See table 3.</td>
<td>wp=1</td>
</tr>
<tr>
<td>wo</td>
<td>—</td>
<td>Sets the wrap overhang for a wrapped float.</td>
<td>wo=8em</td>
</tr>
<tr>
<td>wlw</td>
<td>—</td>
<td>Sets the total width of the wrapped item to a fraction of \textwidth. May be more than the w or lw width.</td>
<td>wlw=.6</td>
</tr>
<tr>
<td>ww</td>
<td>—</td>
<td>Sets the total width of the wrapped item. May be more than the w or lw width.</td>
<td>ww=2in</td>
</tr>
<tr>
<td>va</td>
<td>—</td>
<td>Sets the vertical alignment of the outermost minipage container for the keyfloat. Defaults to 'c'. Ignored by subfigure, subtable.</td>
<td>va=t</td>
</tr>
</tbody>
</table>

<sup>c</sup> None of the keys in Part II are used in the main keys of the keysubfigs, keysubtabs, or keysubfloats environments, but may be used in the optional shared keys to be passed to each object within.
### Table 2: Caption-related key combinations

<table>
<thead>
<tr>
<th>Keys in Use</th>
<th>Type of</th>
<th>Caption</th>
<th>LOF/LOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>c cstar sc</td>
<td></td>
<td>Numbered</td>
<td>Short Caption</td>
</tr>
<tr>
<td>• — —</td>
<td></td>
<td>Numbered</td>
<td>Short Caption</td>
</tr>
<tr>
<td>— • —</td>
<td>Unnumbered</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>— • •</td>
<td>Unnumbered</td>
<td>Short Caption</td>
<td></td>
</tr>
<tr>
<td>— cstar={}</td>
<td>Ignored</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

*Caption*: Shows whether the float will be numbered, unnumbered, or have no caption.

*LOF/LOT*: Shows whether the regular or short caption will appear in the List of Figures or List of Tables, or if there will be no listing.

### Table 3: Key wp: Wrapped float placement options

<table>
<thead>
<tr>
<th>Key</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>r</td>
<td>R to the right of the text body</td>
</tr>
<tr>
<td>l</td>
<td>L to the left of the text body</td>
</tr>
<tr>
<td>i</td>
<td>I to the inside margin</td>
</tr>
<tr>
<td>o</td>
<td>O to the outside margin</td>
</tr>
</tbody>
</table>

The un-capitalized key attempts to place the float “here”, and the capitalized key allows \LaTeX to try to find the best location. The default is O.
### 2.4 Other settings

\texttt{\KFLTtightframe} \{\textit{contents}\} Frames the contents without separation.

\texttt{\KFLTlooseframe} \{\textit{contents}\} Frames the contents with separation.

These may be used to re-define how contents are framed. The default is a simple \fbox.

- **Len \KFLTtightframewidth** Combined width of the frame and separation for each of tight and loose frames. These settings should be adjusted when changing the frame width and/or separation. The value should be equivalent to \fboxwidth plus \fboxsep.

- **Len \KFLTlooseframewidth**

- **Len \KFLTimageboxwidth** The computed width of the image. Useful to enclose an mdframed environment to restrict its width. See example 29.
2.5 Examples

2.5.1 Single floats

Example 1: Figure with an image from a file

Code:
\keyfig\texttt{c=A \cs{keyfig} with an image,l=fig:simple}{image}

Result:
Figure 1

This float (fig. 1) is shown at its natural size because no width or height modifiers were specified. When used alone like this, a regular float is created.

Example 2: Figure with arbitrary contents

Code:
\keyfigbox\texttt{f,c={A \cs{keyfigbox}},l=fig:figbox}
  \{Some text. More text. \par Another paragraph.\}

Result:
Figure 2

The \keyfigbox creates a figure with a box of arbitrary contents, instead of an image from a file. Its default width is the full linwidth, unless \texttt{w} or \texttt{lw} keys are used.
Arbitrary contents may go here.
Including multiple paragraphs.

**Figure 3: A keyfigure environment**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>D</td>
</tr>
</tbody>
</table>

**Example 3: Figure environment with arbitrary contents**

**Code:**

\begin{keyfigure}{f,c={A \env{keyfigure} environment}, l=fig:environment}
Arbitrary contents may go here.
Including multiple paragraphs.
\end{keyfigure}

**Result:**

*Figure 3*

The keyfigure environment is preferred over the \keyfigbox macro when multiple lines of contents are to be included.

**Example 4: Table macro**

**Code:**

\keytab{c=A \cs{keytab} table,l=tab:simpletable}{\testtable}

**Result:**

*Table 4*

Do not try to use tables which overflow the page.

For anything other than a simple table, use the keytable environment. See example 5.

**large tables** For large tables, use the longtable or supertabular packages.
Table 5: A keytable environment

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arbitrary contents may go here.\footnote{A footnote.}</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example 5: Table environment with arbitrary contents

Code:

\begin{keytable}{f,c={A \env{keytable} environment}, l=tab:environment}
Arbitrary contents may go here.\footnote{A footnote.}
\end{keytable}

\testtable
\end{keytable}

Result:

Table 5

The keytable environment is preferred over the $\keytab$ macro since most tables are multi-line creations.

$keytab$ centers the table, but $keytable$ does not. Add $\centering$ if desired.
Figure 4: A figure with many options

Example 6: Figure with many options selected

Code:

```
\keyfig{
    w=2in,ft,r=15,
    c=A figure with many options,
    sc=A figure with options,
    t={Additional text. Multiple paragraphs may be used.
        The entire text is enclosed in braces because a comma
        is included. Alignment may be set by using tags \optn{tc}, \optn{tl}, or \optn{tr}
        instead of \optn{t},
    l=fig:options
}
```

Result:

**Figure 4**

Width is fixed at 2 in, a tight frame is specified (\fboxsep of 0 pt), a short caption appears in the List of Figures, and the additional text is using the default fully-justified alignment.

Since fig. 4 is a float, it may appear on the following page.
Example 7: Using \texttt{\textbackslash{linewidth}}

\textit{Code:}

\texttt{\keyfig{lw=.5,c=Half of \cs{\textit{\textbackslash{linewidth}}},l=fig:linewidth}{image}}

\textit{Result:}

\textit{Figure 5}

`\texttt{\textbackslash{linewidth}}` Figure 5 is half of \texttt{\textbackslash{linewidth}} in size. When the \texttt{lw} key is used inside a \texttt{keyfloats} or \texttt{keysfig} environment, the \texttt{\textbackslash{linewidth}} will be proportional to the sub-box for each element. When used alone, such as here, the \texttt{\textbackslash{linewidth}} is the full width of the text on this page.

\texttt{lw} and \texttt{w} are not used at the same time. If both \texttt{lw} and \texttt{w} are specified, the last one cancels any previous ones.
Example 8: Using frames

Code:

\begin{keyfloats}[hbp][4]
\keyfig{f,c=Loosely-framed figure,l=fig:looseframe}{image}
\keyfig{ft,c=Tightly-framed figure,l=fig:tightframe}{image}
\keytab{f,c=Loosely-framed table,l=tab:looseframe}{\testtable}
\keytab{ft,c=Tightly-framed table,l=tab:tightframe}{\testtable}
\end{keyfloats}

Result:

\textit{Figures 6 and 7 and tables 6 and 7}

\begin{center}
\begin{tabular}{c}
\begin{tabular}{c}
An image.
\end{tabular} \\
\textbf{Figure 6: Loosely-framed figure}
\end{tabular} & \begin{tabular}{c}
An image.
\end{tabular} \\
\textbf{Figure 7: Tightly-framed figure} & \begin{tabular}{|c|c|}
\hline
A & B \\
\hline
C & D \\
\hline
\end{tabular}
\textbf{Table 6: Loosely-framed table} & \begin{tabular}{|c|c|}
\hline
A & B \\
\hline
C & D \\
\hline
\end{tabular}
\textbf{Table 7: Tightly-framed table}
\end{tabular}
\end{center}

The \texttt{f} key adds a loose frame with the current \texttt{fboxsep}. This is desirable in most cases.

The \texttt{tf} key adds a tight frame with no separation. This is useful for framing a photograph, or a diagram which already has a margin.

Framing tables is seldom recommended. In the case of the tight frame, table 7, note that the external frame almost overwrites the table's natural horizontal rules.

\textit{custom frames} Also see section 2.6.1 for customizing frames.
Example 9: Using rotation with boxes

Code:

```latex
\keytab{f,w=.8in,c={Table, rotated},
         r=70,l=tab:rotated,
         tc=(Framed to show box width.)}
```

Result:

Table 8

Unless a width is given, a box is the full \texttt{\linewidth}. When rotated, this extra horizontal space is rotated into extra vertical space. To avoid this extra space, set a \texttt{w} or \texttt{lw} to be wide enough for the table or other contents, but not much wider. When this box is rotated, it will not take much more vertical space than necessary.

\begin{itemize}
  \item \textbf{rotated whitespace} Unless a width is given, a box is the full \texttt{\linewidth}. When rotated, this extra horizontal space is rotated into extra vertical space. To avoid this extra space, set a \texttt{w} or \texttt{lw} to be wide enough for the table or other contents, but not much wider. When this box is rotated, it will not take much more vertical space than necessary.
  \item \textbf{box width} Unlike an image, the frame of a box does not rotate with its contents.
\end{itemize}
Example 10: Located \[H\]ere

Code:

\keytab[H]{c={A table [H]},l=tab:here}{\testtable}
\keyfig[H]{f,w=1in,c={A keyfig [H]},l=fig:here}{image}

Result:

*Table 9, Figure 8*

\begin{table}[H]
\centering
\begin{tabular}{cc}
A & B \\
C & D \\
\end{tabular}
\caption{A table [H]}
\end{table}

\begin{figure}[H]
\centering
\includegraphics[width=1in]{image}
\caption{A keyfig [H]}
\end{figure}

⚠️ **Out of sequence**

Table 9 and Figure 8 are to be placed \[H\]ere, and therefore may appear out-of-sequence with surrounding figures. Place a \texttt{clearpage} before or after to re-sync, if necessary.
Starred caption with a short caption.

Example 11: Unnumbered float

Code:
\keyfig[H]{f,cstar={A starred caption}}{image}

Result:
See fig: "A starred caption".

A starred caption creates a float without a number, and without an entry in the List of Figures unless there is a non-empty short caption. (See the next example.)

⚠️ No label Labels cannot be used when there is no number for a float.

Example 12: Unnumbered float with a \texttt{LOF} entry

Code:
\keyfig{
  f,cstar={Starred caption with a short caption.},
  sc={Starred short caption}
}{image}

Result:
See fig: "Starred caption with a short caption".

A starred caption with a non-empty short caption creates an unnumbered entry in the List of Figures.
Example 13: An unnumbered in-text image

Code:

\keyfig[H]{f,cstar={},
    tc={Optional text which is not a caption.}}{image2}

Result:
See fig: "Optional text which is not a caption."

By using [H] and cstar={}, the image is placed inline without a number or LOF entry. Also see example 14.
Some contents.

A `keyparbox` with no number or label.

Figure 9: Next to a `keyparbox`

Example 14: A box without a caption.

Code:

```latex
\begin{keyfloats}{2}
\keyparbox{
f, lw=.5,
  tc={A \texttt{\textbackslash cs\{keyparbox\} with no number or label.}}
}{Some contents.}
\keyfig{c=Next to a \texttt{\textbackslash cs\{keyparbox\}}, l=fig:nexttoparbox}{image}
\end{keyfloats}
\keyparbox[H]{f, lw=.5}{A \texttt{\textbackslash cs\{keyparbox\}} [H], outside the keyfloats.}
```

Result:

`Figure 9, and the box to its left.`

A `keyparbox` [H], outside the keyfloats.

A `keyparbox` is a `keyfigbox` with cstar={}, and is mostly useful as an information box inside a row or a set of subfloats.
2.5.2 Groups of floats, shared keys, keep aspect ratio

Example 15: Groups of figures — keyfloats environment

Code:

```
\begin{keyfloats}{2}
\keyfig{l=1,c={First in a group},
  l=fig:firstinrow,tl={\cs{raggedright} text}}{image}
\keyparbox{}{\centering A \cs{keyparbox} describing something.
  \par With several paragraphs.}
\begin{keyfloats}{2}[f,l=1,h=3em,kar,va=t]
  \keyfig{l=1,c={Third in a group},
    l=fig:thirdinarow}{image}
  \keyfig{l=1,c={Fourth in a group, with a longer caption}}{image2}
  \keyfig{l=1,c={Fifth in a group}}{image}
  \keyfig{l=1,c={Sixth in a group},
    l=fig:sixthinarow}{image2}
\end{keyfloats}
\keytab{c={Seventh in a group},l=tab:seventhinrow}{\testwidetable}
\end{keyfloats}
```

Result:

Figure 10 to Table 10

The keyfloats environment takes an argument for the number of columns. Additional floats are automatically placed on following rows. Changing the number of columns will cause the floats to automatically readjust as necessary. Leftovers will be centered on the last row. An optional argument may contain keys and values which are passed to each object inside the group.

Fixed-width or fixed-height floats may be too large to fit if they are moved into a group. A warning is issued if so. It is the user’s responsibility to adjust \texttt{w}, \texttt{h}, or \texttt{lw} as necessary. To allow images to automatically adjust, use \texttt{lw=1} or less, which adjusts to the \texttt{\linewidth}.

Keyfloats may be located [H], [M], or located [W] set with half the line width:
An image.

A `\keyparbox` describing something.

With several paragraphs.

\begin{keyfloats}
\begin{tabular}{l}
\textbf{An image.} \\
\textbf{Another image}
\end{tabular}
\end{keyfloats}

\begin{keyfloats}[H]{2}
\begin{tabular}{l}
\textbf{An image.} \\
\textbf{Another image}
\end{tabular}
\end{keyfloats}

Two columns: Keyfloats may be starred to span both columns in a two-column format:
\begin{keyfloats}*
\begin{tabular}{l}
\textbf{An image.} \\
\textbf{Another image}
\end{tabular}
\end{keyfloats}

Grid of images: As shown in the sub group above, to display a group of images of varying shape inside a grid, use the shared option to select a maximum size, keep aspect ratio, and align at the top so that captions of varying length may wrap below each image:
\begin{keyfloats}[lw=1,h=3em,kar,va=t]
\begin{tabular}{l}
\textbf{An image.} \\
\textbf{Another image}
\end{tabular}
\end{keyfloats}
2.5.3 Subfloats

Example 16: Subfigures — keysubfigs environment

Code:

```latex
\begin{keysubfigs}{3}{c=Subfigures,l=fig:subfigs}
\keyfig{lw=1,f,c={First subfigure},
  l=fig:firstsubfig,t=Some text}{image}
\keyfig{lw=1,f,r=90,c={Second subfigure},
  l=fig:secondsubfig,
  t=Lots of lots of lots of lots of text.}{image2}
\begin{keyfloats}{1}
\keyfig{lw=1,f,c={Third subfigure},l=fig:thirdsubfig}{image}
\keytab{c={Fourth subfigure},l=fig:fourthsubfig}\testtable
\keyfig{lw=.5,f,c={Fifth subfigure},l=fig:fifthsubfig}{image}
\end{keyfloats}
\end{keysubfigs}
```

Result:

Figure 15

Figures 15a to 15e are in the fig. 15 keysubfigs environment. The keysubtabs environment is similar. Mixed types have the type of their container, as shown with fig. 15d.
Subfloats are associated floats (a, b, …) collected together into one common float (the enclosing `keysubfigs` or `keysubtabs` environment). The enclosing float can have its own caption (call “Sub-Figures” in the example), which appears in the LOF/LOT, and also a label. Each subfloat can have its own caption and label as well, but the subcaption does not appear in the LOF/LOT.

⚠️ **mixed subfloats** All subfloats are forced to have the same type as its containing float. A table inside a figure will be labeled as a figure, for example. This avoids miss-labeling as each subfloat must clearly be identified as a child of its containing float.

⚠️ **nested subfloats** `keysubfigs` and `keysubtabs` may not be used inside the `keyfloats` environment, and cannot be nested inside each other. (No subfloat 12aa, 12ab, 12ba, etc.)

⚠️ **nested keyfloats** The `keyfloats` environment may be used inside `keysubfigs` or `keysubtabs` to gather subfloats together, such as the three right-most figures in fig. 15.

**location** Subfloats may be located [H], [M], or located [W] set with half the line width:

\begin{keysubfigs}[H]{3}{key/vals . . .}

**two columns** Subfloats may be starred to span both columns in a two-column format:

\begin{keysubfigs}*{2}{key/vals . . .}

**shared keys** A group of subfloats may have an optional argument for shared keys and values, which are then passed to each subfloat within.

⚠️ **va** The vertical alignment option `va` does not work with subfloats.

---

**Example 17: Subtables [H] — keysubtabs environment**

*Code:*

\begin{keysubtabs}[H]{2}{c=Subtables [H], l=tab:subtabs}
\keytab{c=(First subtable), l=fig:firstsubtab}{\testtable}
\keytab{c=(Second subtable), l=fig:secondsubtab}{\testwidetable}
\end{keysubtabs}

*Result:*

*Table 11*

<table>
<thead>
<tr>
<th>a: First subtable</th>
<th>b: Second subtable</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.5.4 Continued floats

The `cont` key may be used to generate a "continued" float. The continued float receives the same number as the previous float, and it is assumed that they are the same float, except that they are separated for some reason such as size on the page.

The label may be placed in a continued float, and will still receive the same float number as the prior non-continued float.

---

**Example 18: Continued figure**

**Code:**

```latex
\begin{keyfloats}{2}
\keyfig{c=Figure to be continued}{image}
\keyfig{c={\dots continued},cont,l=fig:firstcontinued}{image2}
\end{keyfloats}
```

**Result:**

*Figure 16*
2.5.5 Continued subfloats

The keysubfigs and keysubtabs environments may also be given the cont key. The containing environment’s float receives the same number as the previous float (presumably another subfloat container).

Example 19: Continued subfloats

\begin{keysfigs}{2}{c={A set of figures},l=fig:continuedfigures}
\keyfig{c={First of a set},l=fig:contfirst}{image}
\keyfig{c={Second of a set},l=fig:contsecond}{image}
\end{keysfigs}
\begin{keysfigs}{2}{c={\dots continued},cont}
\keyfig{c={Third of a set},l=fig:contthird}{image2}
\keyfig{c={Fourth of a set},l=fig:contfourth}{image2}
\end{keysfigs}
2.5.6 Margin floats

When a keyfloat is located [M], it will be placed in the margin.

When the tufte-book class is used, its marginfigure or margintable environments will be used, otherwise keyfloat provides environments of the same name and uses those instead.

---

**Example 20: The marginfigure environment**

**Code:**

```latex
\begin{marginfigure}
  \centering
  \includegraphics[width=.75\linewidth]{image}
  Some text added by hand.
  \caption{A \texttt{marginfigure}}
  \label{fig:marginfigure}
\end{marginfigure}
```

**Result:**

Figure 18

---

**Example 21: The margintable environment**

**Code:**

```latex
\begin{margintable}
  \centering
  \testwidetable
  \caption{A \texttt{margintable}}
  \label{fig:margintable}
\end{margintable}
```

**Result:**

Table 12
Example 22: Using \keyfig[M]

Code:

\keyfig[M]{c={A \cs{keyfig}\optn{[M]}},l=fig:keyfigm,ft, t=Additional text. Text text text text text text.}

More paragraphs.

\begin{figure}
\centering
\includegraphics{image2}
\caption{A \keyfig[M]}
\end{figure}

Result:
Figure 19

---

Example 23: Using keytable[M] and an offset

Code:

\begin{keytable}
\centering
\testwidetable
\end{keytable}

\begin{keytable}
\centering
\begin{tabular}{ccc}
A & B & C \\
D & E & F \\
\end{tabular}
\end{keytable}

\begin{keytable}
\centering
\testwidetable
\end{keytable}

Result:
Table 13

---

margin float offset

A negative offset was used to shift the table upwards to the top of the example.

distance between floats

To set the minimum-allowed distance between \marginpars and margin floats:

\setlength{\marginparpush}{3ex}
2.5.7 Wrapped floats

Example 24: Using \keyfig[W] and \keytab[W]

Code:

\keyfig[W]{c={A \cs{keyfig}\optn{[W]}},
    l=fig:keyfigw,ft,\linewidth=.4,wp=I, wo=8em, wn=12,
    t={.4\cs{linewidth} wide, placed \optn{I}.}}{image2}
\blindtext
\keytab[W]{c={A \cs{keytab}\optn{[W]}},l=tab:keytabw,w=.75in,}
}{\testtable}
\blindtext

Result:

Figure 20 and table 14


Figure 20: A \keyfig[W]


Table 14: A \keytab[W]

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Example 25: Using `\keyfigbox\[W\]` and `\keyparbox\[W\]`

**Code:**

```
\keyfigbox\[W\]{c={A \cs{keyfigbox}\optn{[W]}},
    l=fig:keyfigboxw,f, lw=.25, wp=I, wn=7,
    t=Text text text text text text text text text}{The contents.}
\blindtext

\keyparbox\[W\]{w=1in}{A \cs{keyparbox}[W] and some more text.}
\blindtext
```

**Result:**

*Figure 21 and the `\keyparbox`.*


Example 26: Using `\keyfigure` and `\keytable`

**Code:**

```latex
\begin{keyfigure}
c={A \cs{keyfigure}\optn{W}},
l=fig:keyfigurew,f,w=1.5in, wo=4em, wn=5
\end{keyfigure}
This is a keyfigure.
\begin{keytable}
c={A \env{keytable}\optn{W}},
l=tab:keytablew,w=2in, wp=L,
tc=Placed \optn{L} and 2in wide.
\centering
\testwidetable
\end{keytable}
```

**Result:**

*Figure 22 and table 15*


**Table 15: A `\keytable`**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>E</td>
<td>F</td>
<td></td>
</tr>
</tbody>
</table>

Placed L and 2in wide.

Example 27: Using keywrap with a \keyfig

Code:

\begin{itemize}
\item First item. Several lines of text text text text text text text text text text text text.
\item \begin{keywrap}{.3\linewidth}{\keyfig{lw=1,c={Keywrap with \cs{keyfig}},l=fig:keywrapfig\image}}
  Second item. Several lines of text text text text text text text text text text text text. These paragraphs are inside the texttt{keywrap}. A vertical gap appears below if the text is not enough to fill the space next to the \cs{keyfig}.
\end{keywrap}
  Outside the \texttt{wrapfig}, \margintag{notes} but still in the second item. There is no elegant way to place only part of a paragraph inside a \texttt{keywrap}, and attempting to do so requires manually removing the vertical paragraph skip.
\item Third item.
\end{itemize}

Result:

Figure 23

- First item. Several lines of text text text text text text text text text text text text.
- Second item. Several lines of text text text text text text text text text text text text. These paragraphs are inside the keywrap. A vertical gap appears below if the text is not enough to fill the space next to the keyfig.

notes

Outside the wrapfig, but still in the second item. There is no elegant way to place only part of a paragraph inside a keywrap, and attempting to do so requires manually removing the vertical paragraph skip.

- Third item.
Example 28: Using wrap width \texttt{ww} and \texttt{wlw}

Code:

```latex
\keyfig[W]{c={A \cs{keyfig}\optn{[W] with \optn{wlw}}},
  l=fig:keyfigwlw,ft,lw=.15,wlw=.4,wp=I,
  t={.15\cs{linewidth} wide, in a .4\cs{linewidth} box.}}{image2}
\blindtext[1]
\keyfig[W]{c={A \cs{keyfig}\optn{[W] with \optn{ww}}},
  l=fig:keyfigww,ft,w=1cm,ww=3cm,wp=I,
  t={1cm wide, in a 3cm box.}}{image2}
\blindtext[1]
```

Result:

\textit{Figures 24 and 25}


2.5.8 Custom frames

Example 29: Custom frames with \texttt{mdframed}

Code:
\begin{verbatim}
\renewcommand{\KFLTtightframe}[1]{%
\begin{minipage}{\KFLTimageboxwidth}
\begin{mdtightframe} #1 
\end{mdtightframe} 
\end{minipage}
}
\setlength{\KFLTtightframewidth}{1pt}
\renewcommand{\KFLTlooseframe}[1]{%
\begin{mdlooseframe}[leftmargin=1.5in,rightmargin=1.5in] #1 
\end{mdlooseframe} 
}
\setlength{\KFLTlooseframewidth}{4pt}
\keyfig{ft,c=Custom-framed image,l=fig:customframe,r=90}{image}
\keyfigbox{f,c=Custom loosely-framed box, l=fig:customlooseframe}{A loosely-framed box.}
\end{verbatim}

Result:
Figures 26 and 27

\textbf{Pkg \texttt{mdframed}}

Example 29 shows custom frames created with the \texttt{mdframed} package along with \texttt{tikz}. Note that \texttt{mdframed} uses the full \texttt{\linewidth} even if the left/right margins are explicitly set, which causes extra vertical space when rotated. Because of this, the framed object is enclosed inside a \texttt{minipage} whose width is precomputed based on the object itself, then set in \texttt{\KFLTimageboxwidth}. Any shadow may fall outside this
Figure 28: Custom shadow

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{image}
\caption{A loosely-framed shadow box.}
\end{figure}

Figure 29: Custom loosely-framed shadow

Example 30: Custom shadows with fancybox

\begin{verbatim}
\renewcommand{\KFLTtightframe}[1]{%
  \setlength{\fboxrule}{.4pt}
  \setlength{\fboxsep}{0pt}
  \setlength{\shadowsize}{2pt}
  \shadowbox{#1}%
}
\setlength{\KFLTtightframewidth}{0.4pt}

\renewcommand{\KFLTlooseframe}[1]{%
  \setlength{\fboxrule}{.4pt}
  \setlength{\fboxsep}{3pt}
  \setlength{\shadowsize}{2pt}
  \shadowbox{#1}%
}
\setlength{\KFLTlooseframewidth}{3.4pt}

\keyfig{ft,c=Custom shadow,l=fig:customshadow}{image}
\keyfigbox{f,c=Custom loosely-framed shadow,lw=.5, lw=\KFLTlooseframewidth}{A loosely-framed shadow box.}
\end{verbatim}

Result:

Figures 28 and 29

Example 30 shows custom shadow frames created with the \texttt{fancybox} package. This combination respects \texttt{lw} and \texttt{w}.

See section 2.6.1 for more details.
The artist's name and optional prefix/suffix are printed below the figure, and an index entry is made for the name in (Last, First) format, or (Last) if there is no first name. If the \texttt{tocdata} package is loaded, the artist's name is also added to the List of Figures, and the \texttt{tocdata} \texttt{\_name}... macros may be used to align the name.
Some fully-justified text just for illustrative purposes, in case you have use for long explanations. This text may be the full \linewidth in size.
Multiple paragraphs of text are allowed.

**Figure 32: Artist's collection**

---

**Example 33: Subfloats with an artist**

**Code:**

\begin{keysubfigs}{2}{
  c=Artist's collection, l=fig:artistcollection, 
  t={Some fully-justified text just for illustrative purposes, in case you have use for long explanations. This text may be the full \cs{linewidth} in size. \par Multiple paragraphs of text are allowed.}, 
  ap=Prefix, af=First, al=Last, as=, Suffix
}
\keyfig{c=Artist's First Work}{image}
\keyfig{c=Artist's Second Work, tc={Commentary about the work.}}{image2}
\end{keysubfigs}

**Result:**

**Figure 32**

A group of figures may be placed into a subfloat container, which may have its own artist keys and additional text. Furthermore, each subfloat inside the collection may also have its own artist tags and additional text.
2.6 Customization

2.6.1 Custom frames

There are two user-redefinable framing macros: \texttt{\KFLTtightframe} and \texttt{\KFLTlooseframe}

A float's contents are placed into a box, which is passed to either of these two macros depending on the key \texttt{f} or \texttt{tf}.

Each macro takes one argument and frames it.

Each macro has a associated \LaTeX lengths:
\texttt{\KFLTtightframewidth} and \texttt{\KFLTlooseframewidth}

These lengths must be redefined to the expected total frame width, equal to the frame thickness plus separation.

The default definitions are:

\begin{verbatim}
\newcommand{\KFLTtightframe}[1]{%
  \setlength{\fboxsep}{0pt}\
  \setlength{\fboxrule}{.4pt}\
  \fbox{#1}\
}
\setlength{\KFLTtightframewidth}{.4pt}
\end{verbatim}

\begin{verbatim}
\newcommand{\KFLTlooseframe}[1]{%
  \setlength{\fboxsep}{3pt}\
  \setlength{\fboxrule}{.4pt}\
  \fbox{#1}\
}
\setlength{\KFLTlooseframewidth}{3.4pt}
\end{verbatim}

See example 29 for an example created with the \texttt{mdframed} package, and example 30 for an example created with the \texttt{fancybox} package.

2.6.2 Distance between floats and rows

To spread out the distance between floats and/or rows of floats on a busy page, the following settings may be changed. The settings used in this documentation are:

\begin{verbatim}
\setlength{\floatsep}{5ex plus 1ex minus 1ex}\
\setlength{\dblfloatsep}{5ex plus 1ex minus 1ex}
\end{verbatim}
2.6.3 Formatting the captions

To modify the typesetting of the captions, see the caption package. The settings used in this documentation are:

% default applied to margin floats:
\captionsetup{labelfont={small,bf},textfont={small,bf}}

\captionsetup[figure]{
  style=default, justification=centering,
  margin=0pt, parskip=0pt, skip=2ex,
  labelfont={small,bf},textfont={small,bf}
}

\captionsetup[table]{
  style=default, justification=centering,
  margin=0pt, parskip=0pt, skip=1ex,
  labelfont={small,bf},textfont={small,bf}
}

\captionsetup[subfigure]{
  style=default, justification=centering,
  margin=0pt, parskip=0pt, skip=2ex,
  labelfont={small},textfont={small}
}

\captionsetup[subtable]{
  style=default, justification=centering,
  margin=0pt, parskip=0pt, skip=1ex,
  labelfont={small},textfont={small}
}
3 Code

3.1 Older packages

Ensure that tocdata, if loaded, is new enough:

\ifpackageloaded{tocdata}{
  \ifpackagelater{tocdata}{2019/03/21}{
    \PackageError{keyfloat} {
      The tocdata package is out of date.\MessageBreak
      Update to tocdata v2.02 2019/03/21 or later\MessageBreak
      to use use this version of keyfloat%
    }{
      Please update the tocdata package. It’s worth it!%
    }
  }{}
}{
\PackageWarning{keyfloat} {Keyfloat uses the caption, subcaption, newfloat, and wrapfig packages.}%}
\KFLT@prohibitpackage {⟨packagename⟩}

3.2 Prohibited packages

Prohibits the use of a certain other packages.

\KFLT@prohibitpackage {⟨packagename⟩}
Prohibits the use of another package, both now and also \AtBeginDocument.

\newcommand*{\KFLT@prohibitpackage}[2]{\KFLT@@prohibitpackage{#1}{#2} \AtBeginDocument{\KFLT@@prohibitpackage{#1}{#2}}}

The list of prohibited packages:

\KFLT@prohibitpackage{floatrow}{caption and subcaption}
\KFLT@prohibitpackage{subfig}{subcaption}
\KFLT@prohibitpackage{subfigure}{subcaption}
\KFLT@prohibitpackage{subfloat}{subcaption}
\KFLT@prohibitpackage{floatflt}{wrapfig}

### 3.3 Required packages

**Pkg etoolbox** v2.6 or later for \BeforeBeginEnvironment, \AfterEndEnvironment

\RequirePackage{etoolbox}[2011/01/03]

**Pkg xparse** Argument processing:

\RequirePackage{xparse}

**Pkg keyval** Key processing:

\RequirePackage{xkeyval}

**Pkg graphicx** For \includegraphics and rotating:

\RequirePackage{graphicx}

**Pkg caption** Handles all caption-related functions:

\RequirePackage{caption}[2010/10/31] v3.2 to support \phantomcaption

**Pkg subcaption** Derived from caption, used to handle subfloats:

\RequirePackage{subcaption}

**Pkg calc** Used to compute box width minus frame sep and width.

\RequirePackage{calc}
Provides rotation via the `turn` environment:

```latex
\RequirePackage{rotating}
```

**Pkg placeins** Provides to process existing floats before adding new ones.

```latex
\RequirePackage{placeins}
```

**Pkg wrapfig** Provides figure wrapping code.

```latex
\RequirePackage{wrapfig}
```

**Pkg gettitlestring** Used by `hyperref` and `nameref`.

Expand names used in titles:

```latex
\PassOptionsToPackage{expand}{gettitlestring}
```

Rows of floats are created by a simple `minipage` environment, instead of relying on a preexisting package. This proved to be advantageous when support was added for multiple rows in one environment.

### 3.4 In-line figures and tables

These macros are commonly used by others.

**Env tablehere** Place a table exactly [H].

```latex
\ProvideDocumentEnvironment{tablehere}()
\%
\vskip\intextsep
\noindent
\minipage{\linewidth}
\def\@captype{table}
\normalcolor\reset@font\normalsize
\endminipage\vskip\intextsep
```

**Env figurehere** Place a figure exactly [H].

```latex
\ProvideDocumentEnvironment{figurehere}()
\%
\vskip\intextsep
\noindent
\minipage{\linewidth}
```
3.5 Row counting and control

Used to count position and wrap at end of each row.

\begin{itemize}
\item \textbf{Ctr KFLT@numcols} Columns per row.
\item \textbf{Ctr KFLT@thiscol} Column currently processing. 0 if not yet in a keyfloats or subfloat.
\item \textbf{Len KFLT@rowboxwidth} How wide is each box in the row.
\end{itemize}

3.6 Float key handling

\begin{itemize}
\item \textbf{Bool KFLT@cont} Continued float?
\item \textbf{Key [main] cont} Continued float?
\item \textbf{\KFLT@c} Caption storage
\item \textbf{Bool KFLT@cstar} Starred caption?
\item \textbf{Key [main] c} Caption
\end{itemize}
Key [main] cstar Caption starred?

\define@key{KFLT@keys}{cstar}{%
\renewcommand{\KFLT@c}{#1}\setboolean{KFLT@cstar}{true}%
}

Key [main] sc Short caption

\define@key{KFLT@keys}{sc}{%
\renewcommand{\KFLT@sc}{#1}\setboolean{KFLT@scgiven}{true}%
}

\KFLT@sc Short caption storage

\newcommand{\KFLT@sc}{}

Bool KFLT@scgiven Was a short caption given?

\newboolean{KFLT@scgiven}

\KFLT@type Float type: “figure”, “table”

\newcommand*{\KFLT@type}{}

Key [main] l Label

\define@key{KFLT@keys}{l}{\renewcommand{\KFLT@l}{#1}}

\KFLT@l Label storage

\newcommand*{\KFLT@l}{}

For the artist/author keys:

Key [main] ap Artist prefix

\define@key{KFLT@keys}{ap}{\renewcommand{\KFLT@ap}{#1}}

\KFLT@ap Storage for artist prefix

\newcommand*{\KFLT@ap}{}
Key [main] af  Artist first name
89 \define@key{KFLT@keys}{af}\{\renewcommand{\KFLT@af}{#1}}

\KFLT@af  Storage for artist first name
90 \newcommand*{\KFLT@af}{}

Key [main] al  Artist last name
91 \define@key{KFLT@keys}{al}\{\renewcommand{\KFLT@al}{#1}}

\KFLT@al  Storage for artist last name
92 \newcommand*{\KFLT@al}{}

Key [main] as  Artist suffix
93 \define@key{KFLT@keys}{as}\{\renewcommand{\KFLT@as}{#1}}

\KFLT@as  Storage for artist suffix
94 \newcommand*{\KFLT@as}{}

Key [main] aup  Author prefix
95 \define@key{KFLT@keys}{aup}\{\renewcommand{\KFLT@aup}{#1}}

\KFLT@aup  Storage for author prefix
96 \newcommand*{\KFLT@aup}{}

Key [main] auf  Author first name
97 \define@key{KFLT@keys}{auf}\{\renewcommand{\KFLT@auf}{#1}}

\KFLT@auf  Storage for author first name
98 \newcommand*{\KFLT@auf}{}

Key [main] aul  Author last name
99 \define@key{KFLT@keys}{aul}\{\renewcommand{\KFLT@aul}{#1}}
\KFLT@al Storage for author last name
100 \newcommand*{\KFLT@aul}{}

Key [main] aus Author suffix
101 \define@key{KFLT@keys}{aus}{\renewcommand{\KFLT@aus}{#1}}

\KFLT@aus Storage for author suffix
102 \newcommand*{\KFLT@aus}{}

\KFLT@textalign Storage for text alignment.
Used for the additional text in the float.
103 \newcommand*{\KFLT@textalign}{}

\KFLT@t Additional text storage
Used for the additional text in the float.
104 \newcommand{\KFLT@t}{}

Create replacement macros in case \texttt{tocdata} is not loaded:
105 \providecommand{\tdartisttextjustify}{}
106 \providecommand{\tdartisttextcenter}{}
107 \providecommand{\tdartisttextleft}{}
108 \providecommand{\tdartisttextright}{}
109 \providecommand{\tdauthortextjustify}{}
110 \providecommand{\tdauthortextcenter}{}
111 \providecommand{\tdauthortextleft}{}
112 \providecommand{\tdauthortextright}{}
113 \providecommand{\tdartistjustify}{}
114 \providecommand{\tdartistcenter}{}
115 \providecommand{\tdartistleft}{}
116 \providecommand{\tdartistright}{}
117 \providecommand{\tdauthorjustify}{}
118 \providecommand{\tdauthorcenter}{}
119 \providecommand{\tdauthorleft}{}
120 \providecommand{\tdauthorright}{}

Key [main] t Additional text, justified alignment.
\begin{verbatim}
\define@key{KFLT@keys}{t}{%
   \renewcommand{\KFLT@t}{#1}%
   \renewcommand{\KFLT@textalign}{}}%

Key [main]  tc  Additional text, centered alignment.
\define@key{KFLT@keys}{tc}{%
   \renewcommand{\KFLT@t}{#1}%
   \renewcommand{\KFLT@textalign}{\centering}%
}

Key [main]  tr  Additional text, aligned to the right.
\define@key{KFLT@keys}{tr}{%
   \renewcommand{\KFLT@t}{#1}%
   \renewcommand{\KFLT@textalign}{\raggedright}%
}

Key [main]  tl  Additional text, aligned to the left.
\define@key{KFLT@keys}{tl}{%
   \renewcommand{\KFLT@t}{#1}%
   \renewcommand{\KFLT@textalign}{\raggedleft}%
}

Key [main]  lw  Fraction of \linewidth
\define@key{KFLT@keys}{lw}{%
   \renewcommand{\KFLT@lw}{#1}%
   \setlength{\KFLT@w}{0pt}%
}
\KFLT@lw  Fraction of linewidth storage: ".5"
\newcommand*{\KFLT@lw}{}

Key [main]  w  Fixed width
\define@key{KFLT@keys}{w}{%
   \setlength{\KFLT@w}{#1}%
}
\KFLT@w  Width storage: "3cm"
\newlength{\KFLT@w}
\end{verbatim}
Key [main]  h  Fixed height

\define@key{KFLT@keys}{h}{\setlength{\KFLT@h}{#1}}

\KFLT@h  Height storage: “2in”

\newlength{\KFLT@h}

Key [main]  kar  Keep aspect ratio

\define@key{KFLT@keys}{kar}{false}{% 
\renewcommand{\KFLT@keepaspectratio}{keepaspectratio}%
} %

\KFLT@keepaspectratio  Stores “keepaspectratio” if set.

\newcommand{\KFLT@keepaspectratio}{}

Key [main]  s  Scale

\define@key{KFLT@keys}{s}{\renewcommand{\KFLT@s}{#1}}

\KFLT@s  Scale storage: “3”

\newcommand*{\KFLT@s}{1}

Key [main]  r  Angle. 90 is counter-clockwise 90 degrees.

\define@key{KFLT@keys}{r}{\renewcommand{\KFLT@r}{#1}}

\KFLT@r  Angle storage: “90”

\newcommand*{\KFLT@r}{0}

Key [main]  f  Frame the image with \KFLTlooseframe.

\define@key{KFLT@keys}{f}{true}{\setboolean{KFLT@f}{#1}}

Bool  KFLT@f  Frame the image?

\newboolean{KFLT@f}
Key [main] \texttt{ft} Tightly frame the image using \texttt{\KFLTtightframe}. This is useful for photographs, or diagrams which already have built-in margins.

\begin{verbatim}
159 \define@key{KFLT@keys}{ft}[true]{\setboolean{KFLT@ft}{#1}}
\end{verbatim}

\textbf{Bool KFLT@ft Tightly frame the image?}

\begin{verbatim}
160 \newboolean{KFLT@ft}
\end{verbatim}

Key [main] \texttt{stretch} Set \texttt{\arraystretch} inside the table environment.

\begin{verbatim}
161 \define@key{KFLT@keys}{stretch}{\renewcommand{\KFLT@stretch}{#1}}
\end{verbatim}

\texttt{\KFLT@stretch} Storage for \texttt{\arraystretch}.

\begin{verbatim}
162 \newcommand*{\KFLT@stretch}[1]{1}
\end{verbatim}

Key [main] \texttt{mo} Set vertical offset for a margin float.

\begin{verbatim}
163 \define@key{KFLT@keys}{mo}{\setlength{\KFLT@mo}{#1}}
\end{verbatim}

\texttt{\KFLT@mo} Storage for the vertical margin offset.

\begin{verbatim}
164 \newlength{\KFLT@mo}
\end{verbatim}

Key [main] \texttt{wn} Set wrap number of narrow lines for a wrapped float.

\begin{verbatim}
165 \define@key{KFLT@keys}{wn}{\renewcommand{\KFLT@wn}{#1}}
\end{verbatim}

\texttt{\KFLT@wn} Storage for the wrap placement.

\begin{verbatim}
166 \newcommand{\KFLT@wn}{}
\end{verbatim}

Key [main] \texttt{wp} Set wrap placement for a wrapped float.

\texttt{See table 3 on page 16.}

\begin{verbatim}
167 \define@key{KFLT@keys}{wp}{\renewcommand{\KFLT@wp}{#1}}
\end{verbatim}

\texttt{\KFLT@wp} Storage for the wrap placement.

\begin{verbatim}
168 \newcommand{\KFLT@wp}{0}
\end{verbatim}
Set wrap overhang for a wrapped float.

\KFLT@wo \ Space for the wrap placement.

Wrapped figure, fraction of \texttt{\linewidth} storage: ".5"

Wrapped figure, fixed width storage: "3cm"

Set vertical alignment of the outermost minipage container.

3.7 Nesting control

Depth inside a keyfigs environment
Inside a `keysubfigs` environment?

\begin{verbatim}
\newboolean{KFLT@inkeysubfloats}
\setboolean{KFLT@inkeysubfloats}{false}
\end{verbatim}

## 3.8 Subfloat key handling

These keys are for the container holding a collection of subfigures.

\begin{verbatim}
\newboolean{KFLT@subgrpcont}
\KFLT@subgrpc
\newboolean{KFLT@subgrpcstar}
\end{verbatim}

### Continued float

\begin{verbatim}
\define@key{KFLT@subgrpkeys}{cont}[true]{%
   \setboolean{KFLT@subgrpcont}{#1}%
}%
\end{verbatim}

### Sub-caption storage

\begin{verbatim}
\newcommand{\KFLT@subgrpc}{}
\end{verbatim}

### Sub-caption starred

\begin{verbatim}
\define@key{KFLT@subgrpkeys}{cstar}{%
   \renewcommand{\KFLT@subgrpc}{#1}\setboolean{KFLT@subgrpcstar}{true}%
}%
\end{verbatim}

### Starred caption

\begin{verbatim}
\define@key{KFLT@subgrpkeys}{sc}{%
   \renewcommand{\KFLT@subgrpsc}{#1}\setboolean{KFLT@subgrpscgiven}{true}%
}%
\end{verbatim}

### Short caption

\begin{verbatim}
\define@key{KFLT@subgrpkeys}{sc}{%
   \renewcommand{\KFLT@subgrpsc}{#1}\setboolean{KFLT@subgrpscgiven}{true}%
}%
\end{verbatim}
\KFLT@subgrpsc Sub-shortcaption storage

203 \newcommand{\KFLT@subgrpsc}{}

\bool KFLT@subgrpscgiven Sub-shortcaption was given?

204 \newboolean{KFLT@subgrpscgiven}

\KFLT@subgrptype Subfloats collection type storage: “figure”, “table”

205 \newcommand*{\KFLT@subgrptype}{}

\KFLT@subgrptextalign Storage for text alignment.

208 \newcommand*{\KFLT@subgrptextalign}{}

\KFLT@subgrpt Additional text storage

209 \newcommand{\KFLT@subgrpt}{}

Key [subfloat container] l Label

206 \define@key{KFLT@subgrpkeys}{l}{\renewcommand{\KFLT@subgrpl}{#1}}
207 \newcommand*{\KFLT@subgrpl}{}

Key [subfloat container] t Additional text — full justification

210 \define@key{KFLT@subgrpkeys}{t}{% 211 \renewcommand{\KFLT@subgrpt}{#1}% 212 \renewcommand{\KFLT@subgrptextalign}{}% 213 }

Key [subfloat container] tc Additional text — center justification

214 \define@key{KFLT@subgrpkeys}{tc}{% 215 \renewcommand{\KFLT@subgrpt}{#1}% 216 \renewcommand{\KFLT@subgrptextalign}{\centering}% 217 }

Key [subfloat container] tl Additional text — aligned left
Additional text — aligned right

For the `tocdata` package:

**Key [subfloat container] t**  Artist prefix

```latex
\define@key{KFLT@subgrpkeys}{tl}{% 
  \renewcommand{\KFLT@subgrpt}{#1}%
  \renewcommand{\KFLT@subgrptextalign}{\raggedright}%
}\KFLT@subgrpt
```

```
\newcommand*{\KFLT@subgrpt}{}
```

**Key [subfloat container] ap**  Storage for artist prefix

```latex
\define@key{KFLT@subgrpkeys}{ap}{\renewcommand{\KFLT@subgrpap}{#1}}
```

```
\KFLT@subgrpap
```

**Key [subfloat container] af**  Storage for artist first name

```latex
\define@key{KFLT@subgrpkeys}{af}{\renewcommand{\KFLT@subgrpaf}{#1}}
```

```
\KFLT@subgrpaf
```

**Key [subfloat container] al**  Storage for artist last name

```latex
\define@key{KFLT@subgrpkeys}{al}{\renewcommand{\KFLT@subgrpal}{#1}}
```

```
\KFLT@subgrpal
```

**Key [subfloat container] as**  Storage for artist suffix

```latex
\define@key{KFLT@subgrpkeys}{as}{\renewcommand{\KFLT@subgrpas}{#1}}
```

```
\KFLT@subgrpas
```

```
\newcommand*{\KFLT@subgrpas}{}
```
Key [subfloat container] aup Author prefix

\define@key{KFLT@subgrpkeys}{aup}{\renewcommand{\KFLT@subgrpaup}{#1}}
\KFLT@subgrpaup Storage for author prefix
\newcommand*{\KFLT@subgrpaup}{}

Key [subfloat container] auf Author first name

\define@key{KFLT@subgrpkeys}{auf}{\renewcommand{\KFLT@subgrpauf}{#1}}
\KFLT@subgrpauf Storage for author first name
\newcommand*{\KFLT@subgrpauf}{}

Key [subfloat container] aul Author last name

\define@key{KFLT@subgrpkeys}{aul}{\renewcommand{\KFLT@subgrpaul}{#1}}
\KFLT@subgrpaul Storage for author last name
\newcommand*{\KFLT@subgrpaul}{}

Key [subfloat container] aus Author suffix

\define@key{KFLT@subgrpkeys}{aus}{\renewcommand{\KFLT@subgrpaus}{#1}}
\KFLT@subgrpaus Storage for author suffix
\newcommand*{\KFLT@subgrpaus}{}

3.9 Computing image width

Len KFLT@imagewidth Computed width of the image
\newlength{\KFLT@imagewidth}

Len KFLT@boxwidth Computed width of the container box
\newlength{\KFLT@boxwidth}
\newlength{\KFLT@wrapwidth}
Figure out how wide to make an image and its container

\ifbool{KFLT@ft}% tight frame?
\setlength{\KFLT@boxwidth}{\linewidth - 2\KFLTtightframewidth}%
\else% not tight frame
\ifbool{KFLT@f}% loose frame?
\setlength{\KFLT@boxwidth}{\linewidth - 2\KFLTlooseframewidth}%
\else% no frame
\fi
Several width options exist. First see if width was given:
\ifdimgreater{\KFLT@w}{0pt}% Width was given:
\setlength{\KFLT@imagewidth}{\KFLT@w}%
\else% width not given
Use full $\text{\textbackslash linewidth}$ or only a fraction:
\ifcsempty{KFLT@lw}%
\setlength{\KFLT@imagewidth}{\KFLT@boxwidth}%
\else% width not given
The wrap width is the same as the image width, unless specified:
\ifdimgreater{\KFLT@ww}{0pt}% Width was given:
\setlength{\KFLT@wrapwidth}{\KFLT@ww}%
\else% wrap width not given
If $\text{\textbackslash lw}$, use a fraction of line width, else if none given use the same as the image width.
\ifcsempty{KFLT@lw}%
3.10 Framing and rotation

A user-redefinable macro and length to tightly frame the contents.

\KFLTtightframe: Redefine to a macro which frames its contents.
\KFLTtightframewidth: Redefine to the total width of the new frame and its separation.

\KFLTtightframe \langle contents \rangle

\newcommand{\KFLTtightframe}[1]{%}
\setlength{\fboxsep}{0pt}%
\setlength{\fboxrule}{.4pt}%
fbox{#1}%

\KFLTtightframewidth Must be set to the combined width of the tight frame and separation used by \KFLTtightframe.

\newlength{\KFLTtightframewidth}
\setlength{\KFLTtightframewidth}{.4pt}

\KFLTlooseframe \langle contents \rangle

A user-redefinable macro and length to loosely frame the contents.

\KFLTlooseframe: Redefine to a macro which frames its contents.
\KFLTlooseframewidth: Redefine to the total width of the new frame and its separation.

\newcommand{\KFLTlooseframe}[1]{%}
\setlength{\fboxsep}{3pt}%
\setlength{\fboxrule}{.4pt}%
fbox{#1}%
keyfloat

\KFLTlooseframewidth  Must be set to the combined width of the loose frame and separation used by \KFLTlooseframe.

\newlength{\KFLTlooseframewidth}
\setlength{\KFLTlooseframewidth}{3.4pt}

\KFLT@frame \{\textlangle contents\rangle\}

Frames the contents according to the f key. To be nested for further processing.

\newcommand{\KFLT@frame}[1][]{%
  \ifbool{KFLT@ft}{%
    \KFLTtightframe{#1}%
  }{% not tightframe
    \ifbool{KFLT@f}{%
      \KFLTlooseframe{#1}%
    }{%#1} no frame
  }% not looseframe
}\}

\KFLT@findenvboxwidth  Figures the width of the contents of \KFLT@envbox plus the frame:

\newcommand{\KFLT@findenvboxwidth}{%
  \settowidth{\KFLTimageboxwidth}{\usebox{\KFLT@envbox}}%
  \ifbool{KFLT@ft}{%
    \addtolength{\KFLTimageboxwidth}{2\KFLTtightframewidth}}{% not tightframe
    \ifbool{KFLT@f}{%
      \addtolength{\KFLTimageboxwidth}{2\KFLTlooseframewidth}}{%#1} no frame
  }% not looseframe
}\}

3.11 A graphics image from a file

\KFLT@testwidth  Used to find the width of a graphics image.

\newlength{\KFLT@testwidth}

\KFLT@includegraphics \{\langle keys\rangle\} \{\langle file name\rangle\}

Issue a warning if the image will be too wide, then display the image.

\newcommand*{\KFLT@includegraphics}[2][%
Find the width of the image:

\settowidth{\KFLT@testwidth}{\includegraphics[#1]{#2}}%

Avoid rounding errors when using the \texttt{lw} option, and also avoid the exact line width in case images are side-by-side.

If close to \texttt{linewidth}, use slightly less than the \texttt{linewidth}:

\ifboolexpr{\iffreeof\KFLT@testwidth{\\linewidth} and \iffreeof\KFLT@testwidth{\\linewidth+1pt} }
{\setlength{\KFLT@testwidth}{\\linewidth-.01pt}}{}

Issue a warning if wider than the \texttt{linewidth}:

\ifdimgreater{\KFLT@testwidth}{\\linewidth}{%\PackageWarning{keyfloat}{The image is wider than the line width}%}

Display the image:

\includegraphics[#1]{#2}

\KFLT@onefigureimage \{\texttt{filename}\}

Create an image with size, frame, and turn.

\NewDocumentCommand{\KFLT@onefigureimage}{m}{% Several possible combinations of linewidth, width, and height are available, and each is treated separately. Scaling and width/height are done first, then framing, then rotation.

\begin{lrbox}{\KFLT@envbox}{% Handle the \texttt{lw} key. If \texttt{lw} is used, width and height are ignored.

\ifdefempty{\KFLT@lw}{% not linewidth

Handle the \texttt{w} key, which may be used along with the \texttt{h} key:
\ifdimgreater{\KFLT@w}{0pt}  
\ifdimgreater{\KFLT@h}{0pt}

Width and height are both given:

\KFLT@includegraphics[  
scale=\KFLT@s,  
width=\KFLT@imagewidth,  
height=\KFLT@h,  
\KFLT@keepaspectratio,  
][#1]  
}% w and h

Only width:

\KFLT@includegraphics[  
scale=\KFLT@s,  
width=\KFLT@imagewidth,  
\KFLT@keepaspectratio,  
][#1]  
}% only w

Width was not given, so maybe handle h alone:

\ifdimgreater{\KFLT@h}{0pt}

h was given:

\KFLT@includegraphics[  
scale=\KFLT@s,  
height=\KFLT@h,  
\KFLT@keepaspectratio,  
][#1]  
}%

If none were given, use the image's natural size:

\KFLT@includegraphics[  
scale=\KFLT@s,  
\KFLT@keepaspectratio,  
][#1]
\KFLT@dosimplecaption \{\langle star?\rangle\}\{\langle short cap or -NO VALUE-\rangle\}\{\langle caption\rangle\}

Calls \caption depending on several combinations of star and short captions being given.
There are two versions of \texttt{KFLT@docaption}, depending on whether \texttt{tocdata} is loaded.

\begin{verbatim}
\ifpackageloaded{tocdata}
\newcommand*{\KFLT@@docaption}[6]{%
\addvspace{\smallskipamount}%
\ifcempty{KFLT@#6t}{%
\IfBooleanTF{#3}{%\csuse{caption#1}*[#4]{#5}{\csuse{KFLT@#6a#2p}}{\csuse{KFLT@#6a#2f}}{\csuse{KFLT@#6a#2l}}{\csuse{KFLT@#6a#2s}}}{%\csuse{caption#1}{#5}{\csuse{KFLT@#6t}}{\csuse{KFLT@#6a#2p}}{\csuse{KFLT@#6a#2f}}{\csuse{KFLT@#6a#2l}}{\csuse{KFLT@#6a#2s}}}{%\ifcsstring{KFLT@#6textalign}{\csuse{td#1textjustify}}{\csuse{td#1textcenter}}{\csuse{td#1textright}}{\csuse{td#1textleft}}}{%\csuse{caption#1}*[#4]{#5}{\csuse{KFLT@#6t}}{\csuse{KFLT@#6a#2p}}{\csuse{KFLT@#6a#2f}}{\csuse{KFLT@#6a#2l}}{\csuse{KFLT@#6a#2s}}}{%\csuse{caption#1}{#5}{\csuse{KFLT@#6t}}{\csuse{KFLT@#6a#2p}}{\csuse{KFLT@#6a#2f}}{\csuse{KFLT@#6a#2l}}{\csuse{KFLT@#6a#2s}}}{%\csuse{caption#1}{#5}}%
\end{verbatim}

\texttt{(tocdata} does not expand its text argument before checking for empty.)
Depending on whether the `tocdata` package is present, and an artist is specified, use either \caption or \captionartist.

The fourth argument is {} if a regular float, or subgrp if `keysubfigs` or `keysubtabs`.

See Table 2 for the possible combinations of the caption-related keys: c, cstar, and sc.

With `tocdata`:

\begin{verbatim}
\NewDocumentCommand{\KFLT@docaption}{s o m m}{% 
  Is the last name empty? Assume no artist if so.
  \ifcempty{KFLT@#4al}% 
    {% figure w/o artist 
      \ifcempty{KFLT@#4aul}% 
        {% figure w/o artist or author 
          \KFLT@dosimplecaption{#1}{#2}{#3}% 
        }% figure w/o artist or author 
      }% figure w/ author 
      \KFLT@@docaption{author}{u}{#1}{#2}{#3}{#4}% 
    }% figure w/o artist 
  }% figure with an artist 
% KFLT@tocdata
\end{verbatim}
Without tocdata:
\KFLT@docaption * \langle 2: short caption \rangle \{ \langle 3: caption \rangle \{ 4: empty or “subgrp” \}\}
\NewDocumentCommand{\KFLT@docaption}{s o m m}
{% no tocdata
If tocdata is not loaded, use a simple caption.
\KFLT@dosimplecaption[#1][#2][#3]%
Create an index entry depending on whether there is a last, first name:
\ifcsempty{KFLT@#4al}%
{% no artist
  \ifcsempty{KFLT@#4auf}%
    {% yes author
      \ifcsempty{KFLT@#4af}%
        {\index{\csuse{KFLT@#4al}}}%
        {\index{\csuse{KFLT@#4al}, \csuse{KFLT@#4af}}}%
      % yes artist
    }% no artist
  }% yes artist
}% no tocdata
\KFLT@caption \langle empty or “subgrp” \rangle

Caption-creation logic.
The argument is () if a regular float, or subgrp if keysubfigs or keysubtabs.
See Table 2 for the possible combinations of the caption-related keys: c, cstar, and sc.
\newcommand{\KFLT@caption}[1]{% A starred caption is printed but not numbered.
  \ifbool{KFLT@#1cstar}% starred caption?
This is a starred caption:

\%starred caption

A key given as cstar={} yields a float with no caption at all.

\ifcsempty{KFLT@#1c}% cstar={}?
\%

Non-empty starred caption might have a \texttt{LOF} entry if it has a short caption \texttt{sc} key:

\% non-empty starred caption
\ifcsempty{KFLT@#1sc}%

No \texttt{sc} short caption, but there is a \texttt{cstar}, so no \texttt{LOF} entry:

\%

Both \texttt{cstar} and \texttt{sc} were given, so add a \texttt{LOF} entry:

\% non-empty \texttt{cstar} and \texttt{sc}:
\edef\KFLT@listtype{\csuse{KFLT@#1type}}%
\addcontentsline{\csuse{ext@\KFLT@listtype}}{\csuse{KFLT@#1type}}{\KFLT@sc}%
\%

In the following, the test for an empty caption is because the \texttt{caption} package does not detect an empty caption if it is given as a macro.

cstar was given, so create an unnumbered caption:

\ifcsempty{KFLT@#1c}%
\\KFLT@docaption*{\csuse{KFLT@#1c}}{\csuse{KFLT@#1c}}%
\%
\)
\% starred caption

Unstarred caption \texttt{c} was given, so number this float:

\% unstarred caption
\ifcsempty{KFLT@#1sc}%
\%
\ifcsempty{KFLT@#1c}%
\\KFLT@docaption{\csuse{KFLT@#1c}}{\csuse{KFLT@#1c}}%
\%
\)
\% no short cap
\%
\( \)
\% short cap
\%
\ifcsempty{KFLT@#1c}%
3.13 Defaults for a new float

\KFLT@defaults

Defaults all settings before reading the keys.
3.14 Row start/end processing

\KFLT@maybestartfloatrow \textbf{Counts rows}

After ending a preexisting row, move to the next row. The use of \texttt{\defcounter} makes this counter change local.

\KFLT@maybeendfloatrow \textbf{Counts rows}

Adds vertical space then resets to allow the start of a new row. The use of \texttt{\defcounter} makes this counter change local.

3.15 Key environment helper macros

\KFLT@trackrows \textbf{Tracks and spaces rows and columns.}

If are nested inside a keyfloats or a subfloat:

\begin{verbatim}
561 \ifboolexpr{\% test (ifnumgreater{\value{KFLT@keyfloatdepth}}{0}) or\% 562 bool(KFLT@inkeysubfloats)\% 563 )\% 564 (% nested
\end{verbatim}
keyfloat

Tracks row start and end:

\KFLT@maybestartfloatrow

Possibly fill space between columns:

\ifnumgreater{\value{KFLT@thiscol}}{1}{\hfill}{\hfill}

\KFLT@addtext {⟨empty or “subgrp”⟩}

Adds optional additional text.

The argument is {} if a regular float, or subgrp if keysubfigs or keysubtabs.

\newcommand{\KFLT@addtext}[1]{

Is there text to add?

\ifcempty{\KFLT@#1t}{}{\% text to add}

Add some space, then create a full-width minipage to contain the text:

\addvspace{\smallskipamount} \begin{minipage}{\linewidth}

Inside this minipage, temporarily prevent underfull \hbox warnings:

\hbadness=10000 \relax

Set the alignment and some text parameters:

\csuse{KFLT@#1textalign} \footnotesize \setlength{\parskip}{1.5ex} \setlength{\parindent}{0em}

Typeset the actual text:

\csuse{KFLT@#1t}
Close it all out with a little more space:

\end{minipage}
\par
\addvspace{2ex}
\% local
\)
\% text to add
\}

\KFLT@optionalname \{\langle name\rangle\}

Adds optional artist's name and the following space.

\newcommand{\KFLT@optionalname}[1]
\ifblank{#1}{}
{\#1~}
}

\KFLT@addartisttext \{\langle empty or "subgrp"\rangle\}

Adds optional additional text.

The argument is {} if a regular float, or subgrp if keysubfigs or keysubtabs.

One of two versions is used, depending on whether the toadata package is available.

If toadata is loaded and this float has an artist or author, then the float's artist's information and optional text will be printed elsewhere by \KFLT@caption. Otherwise, the text is printed here.

Two versions, depending on whether toadata is loaded:

\@ifpackageloaded{tocdata}
\% toadata loaded

If toadata is loaded:

\newcommand{\KFLT@addartisttext}[1]
\ifcempty{KFLT@#1al}\% artist last name
\%
\ifcempty{KFLT@#1aul}\% author last name
\{\KFLT@addtext{#1}\}

%
If \texttt{tocdata} is not loaded, the name and text are added here:

\begin{verbatim}
\% tocdata not loaded
\end{verbatim}

Factored from \texttt{\KFLT@addartisttext}

\begin{verbatim}
\newcommand*{\KFLT@@addartisttext}{% Add space and create the name inside a full-width minipage:
 \addvspace{\medskipamount}%
 \begin{minipage}{\linewidth}%
 Inside this minipage, temporarily prevent underfull \hbox warnings:
 \hbadness=10000\relax%
 Text alignment is \#3, and depends on artist or author:
 \footnotesize\textsc{
 \KFLT@optionalname{\csuse{KFLT@#1a#2p}}%
 \KFLT@optionalname{\csuse{KFLT@#1a#2f}}%
 \csuse{KFLT@#1a#2l}%
 \csuse{KFLT@#1a#2s}%
 }%
 \end{minipage}%
 \par\addvspace{2ex}%
}
\end{verbatim}

\begin{verbatim}
\newcommand{\KFLT@addartisttext}{% Only use the artist information if a last name is given:
 \ifcempty{KFLT@#1al}%
 {\% artist last name not given
 \ifcempty{KFLT@#1aul}%
 {\% artist last name not given
 \ifcempty{KFLT@#1aul}%
 {\% artist last name not given
 \end{verbatim}
The computed width of the object. This may be used as the width parameter of a minipage to encase the object.

\newlength{\KFLTimageboxwidth}

Typeset the contents in a width which depends on the keys.

\newsavebox{\KFLTenvbox}
\NewDocumentEnvironment{KFLT@boxinner}{}

(Possibly) frame the contents of an \texttt{lrbox}:

\begin{lrbox}{\KFLTenvbox}

Rotate the contents:

\turn{\KFLT@r}

Box the contents in the width computed by \texttt{\KFLT@findwidths}:

\minipage{\KFLT@imagewidth}

Spacing inside the box. Also default to regular justified text alignment.

\setlength{\parskip}{2ex}
\renewcommand{\arraystretch}{\KFLT@stretch}
End of the environment:

\% endkeyboxinner
\endminipage%

End the rotated box:

\endturn%

Possibly frame:

\end{lrbox}%
\KFLT@frame{\usebox{\KFLT@envbox}}%
\par%
\% endkeyboxinner

\KFLT@sharedkeys  Key/values to apply to each object in this group, such as a keyfloats or keysubfigs.

\newcommand{\KFLT@sharedkeys}{}

\KFLT@boxkeys  {{keys}} {{float type}}

Default the options, adjust for a table, then parse the keys:

\NewDocumentCommand{\KFLT@boxkeys}{+m m}{%
  Set the key defaults:
  \KFLT@defaults%
  Remember the float type:
  \renewcommand{\KFLT@type}{#2}%
  Set the shared keys. Expansion seems to be required for xkeyval.
  \edef\next{\noexpand\setkeys{KFLT@keys}{\KFLT@sharedkeys}}%
  \next%
  Set the float-specific keys, which might overwrite the group's keys:
  \setkeys{KFLT@keys}{#1}%
  }

\Bool KFLT@captionistop  Saves the value of \caption@position, which may become unreliable if using Ko-
\captionsetup{table}{position=above}
\newbool{KFLT@captionistop}

\KFLT@LWR@hook@boxouter

\newcommand*{\KFLT@LWR@hook@boxouter}{}%

\Env KFLT@boxouter \{\texttt{\textbackslash star}?) \} \{\texttt{\textbackslash loc}\}

Boxes the contents of figures and floats.

Not used by subfigures.

\NewDocumentEnvironment{KFLT@boxouter}{m m}{}

The keyfigure and keytable environments handle the contents in one of three possible ways, depending on whether it is called alone, inside a keyfloats environment, or inside a keysubfigs or keysubtabs environment.

Start the new subfigure or subtable, of the given width:

\ifbool{KFLT@inkeysubfloats}{}{\csuse{sub\KFLT@type}{\KFLT@rowboxwidth}}

If keyfloats, place the contents inside a minipage:

\% not subfloat:
\ifnumgreater{\value{KFLT@keyfloatdepth}}{0}%
\%
\ifbool{KFLT@keywrap}{}{\minipage\texttt{\textbackslash loc}}{\KFLT@rowboxwidth}%
\%
\captionsetup*{type=\KFLT@type}%

\%

A hook for \texttt{lwpark} to set \texttt{\textbackslash linewidth}, etc.

\KFLT@LWR@hook@boxouter%

Not a subfloat or keyfloats, so create a single float.

See if inside a keywrap. If so, force \texttt{[H]} and vertical align top.

\ifbool{KFLT@keywrap}{}
See if the float should [W]rap:

\ifstrequal{#2}{W}{}

Place [W], so create a wrapfloat using the \texttt{wrapfig} package:

{ [W] }

Temporarily figure out \texttt{\KFLT@imagewidth}, and make the wrapped figure environment as wide as the desired image size plus frame:

\KFLT@findwidths%

Expand the arguments for \texttt{wrapfig}:

\edef\next{\noexpand\wrapfloat{\KFLT@type}{\KFLT@wn}{\KFLT@wp}{\KFLT@wo}}
\edef\next{\KFLT@wrapwidth+2\KFLTlooseframewidth}
\minipage{\KFLT@wrapwidth+2\KFLTlooseframewidth}

Inside this minipage, temporarily prevent underfull \texttt{\hbox} warnings:

\hbadness=10000\relax%
\normalcolor\reset@font\normalsize

Change the interior image to the discovered fixed width.

\renewcommand{\KFLT@lw}{}
\renewcommand{\KFLT@w}{\KFLT@imagewidth}
\renewcommand{\KFLT@wlw}{}
\renewcommand{\KFLT@ww}{0pt}
{ [W] }
{ % not [W] }
See if the float should be positioned in the [M]argin:

\ifstrequal{#2}{M}%

Place [M], so create a marginfloat:

{% [M]
 \KFLT@marginfloat[\KFLT@m\o]{\KFLT@type}%
%
%
{% not [M]

See if the float should be positioned [H]ere:

\ifstrequal{#2}{H}%

Place [H], so create an inline minipage:

{% [H]
 \vskip\intextsep%
 \noindent\minipage[\KFLT@va]{\linewidth}%
 \normalcolor\reset@font\normalsize%
 \captionsetup{type=\KFLT@type}%
%
%
}% [H]

Not [H], so create a float: For a starred float, make a two-column table in a two-col format.

{% not [H]
 \IfBooleanTF{#1}%
 {\csuse{\KFLT@type*}[#2]}%
 {\csuse{\KFLT@type}[#2]}%
%
%s [H]
%
}% not [M]

}% not [W]

}% not keywrap

)% not keyfloats

}% not subfloat

Handle a continued float. Ignored if in a subfloat.

\ifbool{KFLT@cont}{\ContinuedFloat}{}

Figure out image and parbox widths for the contents:

\KFLT@findwidths%

Place the caption above the contents depending on \texttt{caption position} option:
Typeset the contents:

\center\unskip

End of the KFLT@boxouter environment:

{% endboxouter
% endcenter\unskip
% addvspace(\smallskipamount)

Optionally print artist's name and additional text:

% KFLT@addartisttext()

Place the caption below the contents depending on caption position option:

% KFLT@captionistop}{% KFLT@caption{}

If are inside keysubtabs, end the subtable:

% KFLT@inkeysubfloats%
% \csuse{endsub\KFLT@type}% subfloat
% }% not subfloat
% \ifnumgreater{\value{KFLT@keyfloatdepth}}{0} % keyfloats?
% %
% \endminipage%
% }% keyfloats
% }% not keyfloats

Not subfloat or keyfloats, so is an individual float.

Close the minipage or float:

See if in a keywrap:

% KFLT@keywrap%
% \endminipage%
% \par addvspace(\baselineskip)%
See if the float should \texttt{W}rap:

\begin{verbatim}
\ifstrequal{#2}{W}\
\endminipage\
\endwrapfloat\
\end{verbatim}

Place \texttt{W}, so close the wrap float:

\begin{verbatim}
\ifstrequal{#2}{W}\endminipage\endwrapfloat\end{verbatim}

See if the float should be positioned in the \texttt{M}argin:

\begin{verbatim}
\ifstrequal{#2}{M}\endKFLT@marginfloat\end{verbatim}

\texttt{H} or float:

\begin{verbatim}
\ifstrequal{#2}{H}\endminipage\vskip\intextsep\end{verbatim}

\KFLT@@ignorespaces \{\texttt{commandname}\} Only do command if not nested inside something.
3.16 The \texttt{\KFLT@keyflt} macro

\texttt{\KFLT@keyflt } \{\langle 1:star\rangle \} \{\langle 2:loc\rangle \} \{\langle 3:type\rangle \} \{\langle 4:keys/values\rangle \} \{\langle 5:contents\rangle \}

A lower-level macro to generate a float with its contents. This is used by \texttt{\keyfig} and \texttt{\keyflt}.

\begin{verbatim}
\NewDocumentCommand{\KFLT@keyflt}{m m m +m +m} {\ifcsdef{ftype@#3}{}{\PackageError{keyfloat} {\protect\keyflt: Invalid float type. MessageBreak} {\protect\keyflt*[loc]{type}{keys/values}{contents}MessageBreak} Also, \protect\keyflt\space is not an environment} {Check argument order and float type.} }\KFLT@ignorespaces\KFLT@trackrows\KFLT@boxkeys{#4}{#3}\begin{group}
\end{verbatim}
3.17 The \keyflt macro

\keyflt * \langle loc \rangle \langle type \rangle \langle keys/values \rangle \langle contents \rangle

A user-level macro to generate a float with its contents centered inside an inner box. This may be used by itself, or inside a keyfloats or keysubtabs environment.

\NewDocumentCommand{\keyflt}{s O{tbp} m +m +m}{\KFLT@keyflt{#1}{#2}{#3}{#4}{\KFLT@boxinner% \centering#5\endKFLT@boxinner%}}\endkeyflt

Generates an error in case the user tried to use \keyflt as an environment.

\def\endkeyflt{%\PackageError{keyfloat}{%\protect\end{keyflt}:%MessageBreak\protect\keyflt:space is a macro, not an environment.%MessageBreakPerhaps you want the keyfloat environment instead%}%

\newcommand{\KFLT@keyfloatstart}[4]{%\KFLT@envignorespaces%\KFLT@boxkeys{#4}{#3}}

3.18 The keyfloat environment

\KFLT@keyfloatstart \langle star? \rangle \langle loc \rangle \langle float type \rangle \langle keys/values \rangle

\newcommand{\KFLT@keyfloatstart}[4]{%\KFLT@envignorespaces%\KFLT@boxkeys{#4}{#3}}
3.19 The keyfigure environment

Extra code to track rows outside of the keyfigure environment, before it starts. This is done to allow nesting without losing track of the prior level.
3.20 The `\keyfig` macro

\keyfig *\[\langle 2:\text{loc} \rangle\}\{\langle 3:\text{keys/values} \rangle\}\{\langle 4:\text{image filename} \rangle\}

A user-level macro to generate a figure with an image. This may be used by itself, or inside a keyfloats or keysubfigs environment.

\NewDocumentCommand{\keyfig}{s O{tbp} +m m}{\KFLT@keyflt{#1}{#2}{figure}{#3}{\KFLT@onefigureimage{#4}}}

3.21 The `\keyfigbox` macro

\keyfigbox *\[\langle \text{loc} \rangle\}\{\langle\text{keys/values}\rangle\}\{\langle\text{box contents}\rangle\}

A user-level macro to generate a figure with arbitrary paragraph contents. This may be used by itself, or inside a keyfloats or keysubtabs environment.

\NewDocumentCommand{\keyfigbox}{s O{tbp} +m +m}{\KFLT@ignorespaces\KFLT@trackrows\KFLT@boxkeys{#3}{figure}\begingroup\KFLT@boxouter{#1}{#2}\KFLT@boxinner\endKFLT@boxinner\endKFLT@boxouter\endgroup\KFLT@ignorespaces}

3.22 The `\keyparbox` macro

\keyparbox *\[\langle \text{loc} \rangle\}\{\langle\text{keys/values}\rangle\}\{\langle\text{box contents}\rangle\}

\NewDocumentCommand{\keyparbox}{s O{tbp} +m +m}{\KFLT@ignorespaces\KFLT@trackrows\KFLT@boxkeys{#3}{figure}\begingroup\KFLT@boxouter{#1}{#2}\KFLT@boxinner\endKFLT@boxinner\endKFLT@boxouter\endgroup\KFLT@ignorespaces}
A user-level macro to generate a figure with arbitrary paragraph contents, but no number or caption. This is equal to a \keyfigbox{} with cstar={}. This may be used by itself, or inside a keyfloats or keysubtabs environment.

\NewDocumentCommand{\keyparbox}{s O{tbp} +m +m}{\KFLT@ignorespaces\KFLT@trackrows\KFLT@boxkeys(#3){figure}%
Force cstar={}:\renewcommand{\KFLT@c}{}\setboolean{KFLT@cstar}{true}%
Continue like \figbox:\begingroup\KFLT@boxouter{#1}{#2}\KFLT@boxinner{#4}\endKFLT@boxinner\endKFLT@boxouter\KFLT@ignorespaces%}

3.23 The \keytab macro

\keytab * \langle loc \rangle \{ \langle keys/values \rangle \} \{ \langle tabular contents \rangle \}

A user-level macro to generate a table with tabular contents. This may be used by itself, or inside a keyfloats or keysubtabs environment.
3.24 The keytable environment

Env keytable * \[\langle loc\rangle\] \{\langle keys/values\rangle\}

\NewDocumentEnvironment{keytable}{s O{tbp} +m}{\KFLT@keyfloatstart{#1}{#2}{table}{#3} \KFLT@keyfloatend}{

Before keytable Extra code to track rows outside of the keytable environment, before it starts. This is done to allow nesting without losing track of the prior level.

\BeforeBeginEnvironment{keytable}{{\KFLT@trackrows}}

3.25 A row of floats

\KFLT@nonest Error message if tried to nest subfloats.

\newcommand*{\KFLT@nonest}{% \ifboolexpr{% test {\ifnumgreater{\value{KFLT@keyfloatdepth}}{0}} or boolean {KFLT@inkeysubfloats} }{% \PackageError{keyfloat}{Cannot nest keysubfigs or keysubtabs.\MessageBreak(Not in outer par mode.)}{\KFLT@trackrows} }{\PackageError{keyfloat}{The subcaption package do not support nested environments,\MessageBreak so the keyfloat package cannot place a\MessageBreak keysubfigs or keysubtabs environment inside another,\MessageBreak or inside a keyfloats.}{\KFLT@trackrows}}
keyfloat

\KFLT@LWR@hook@keyfloats  Used by lwarp.

\newcommand*{\KFLT@LWR@hook@keyfloats}{}%

\KFLT@LWR@hook@keyfloatsminipage  \{\textit{contents}\}

Modified by lwarp.

\newenvironment*[\KFLT@LWR@hook@keyfloatsminipage][1]\{
\noindent\minipage[\KFLT@va]{#1}\}
{\endminipage}

\texttt{keyfloats}  \*  \[(\langle\textit{loc}\rangle)\]  \{(\langle\textit{num columns}\rangle)\}  \{(\langle\textit{shared keys/values}\rangle)\}

User-level macro to create rows of figures/tables. Wrapping occurs after the number of specified columns. \textit{keyfloats} environments may be nested to create a vertical set of figures next to a single larger figure, for example.

Place \texttt{keyfig}, \texttt{keyfigbox}, and \texttt{keytab} commands inside the \textit{keyfloats} environment.

Note that \texttt{lw} linewidth keys may need to be adjusted inside a \textit{keyfloats}, \textit{keysubfigs}, or \textit{keysubtabs}, since \texttt{\linewidth} changes depending on the number of columns. Likewise, manually-selected \texttt{w} width and \texttt{h} tags may need to be adjusted to prevent overflow.

\texttt{\NewDocumentEnvironment{keyfloats}{s O{tbp} m O{}}%}
\texttt{\KFLT@envignorespaces%}

A hook for \texttt{lwarp} to set \texttt{\linewidth}, etc.

\texttt{\KFLT@LWR@hook@keyfloats%}

Track the depth:

\texttt{\addtocounter{KFLT@keyfloatdepth}{1}}%

Nest the group’s keys.

\texttt{\edef\KFLT@outersharedkeys{\KFLT@sharedkeys}%}
\texttt{\edef\KFLT@sharedkeys{\KFLT@sharedkeys,#4}}%

If [H], nested, subfloats, or keywrap, use a minipage instead of a float:
Create an inline minipage:

\ifboolexpr{\ifstrequal{#2}{H} or
\ifnumgreater{\value{KFLT@keyfloatdepth}}{1} or
\bool{KFLT@inkeysubfloats}
\bool{KFLT@keywrap}
}\%

Create the containing minipage:

\KFLT@LWR@hook@keyfloatsminipage{\KFLT@rowboxwidth}%
\%
\vskip\intextsep
\KFLT@LWR@hook@keyfloatsminipage{\linewidth}%
\%

Reset font and color:

\normalcolor\reset@font\normalsize%

If inside subfloats, generate subfigures by default:

\ifbool{KFLT@inkeysubfloats}%
\%
\captionsetup*{type=figure}%
\%

Isn't [H] or nested

\% See if [W]:
\ifstrequal{#2}{W}
\%
\% [W]:
\[W:\]
\wrapfloat{figure}{O}{.5\linewidth}%
\minipage{\linewidth}%

Inside this minipage, temporarily prevent underfull \hbox warnings:

\hbadness=10000\relax%
\normalcolor\reset@font\normalsize%

{% not \[H:
\ifstrequal{#2}{M}%
\KFLT@marginfloat{figure}%
}%

A normal figure:

{% figure
\IfBooleanTF{#1}% starred figure, two-col figure in a two-col format
{\begin{figure*}[#2]%
{\begin{figure}[#2]%
}% figure
}\% not [H]
}

Compute the width of each entry:

\ifboolexpr{%
\test \{\ifnumgreater{\value{KFLT@keyfloatdepth}}{1}} or
\bool{KFLT@inkeysubfloats}
}\%

Nested or subfloats:

{\setlength{\KFLT@rowboxwidth}{.9\KFLT@rowboxwidth/\real{#3}}}%

Keyfloats:

{\setlength{\KFLT@rowboxwidth}{.9\linewidth/\real{#3}}}%

Center the contents:

\centering%
Count columns using \defcounter for a local effect:

\defcounter{KFLT@numcols}{#3}%
\defcounter{KFLT@thiscol}{0}%
}% starting keyfloats environment

When ending a keyfloats environment:

% ending keyfloats environment

[H] or rows/subfigs? Close a minipage:

\ifboolexpr{
  test \{\ifstrequal{#2}{H}\} or
  test \{\ifnumgreater{\value{KFLT@keyfloatdepth}}{1}\} or
  bool \{KFLT@inkeysubfloats\} or
  bool \{KFLT@keywrap\}
}{% was \[H\], etc.
  \endKFLT@LWR@hook@keyfloatsminipage%
}{% not nested
  \vskip\intextsep%
}{% was \[H\], etc.

Spacing if nested or not:

\ifboolexpr{
  test \{\ifnumgreater{\value{KFLT@keyfloatdepth}}{0}\} or
  bool \{KFLT@keywrap\}
}{% not nested
  }%
}{% was \[H\], etc.

Not [H]:

% not \[H\], etc.
\ifstrequal{#2}{W}%
% \[W]\:

[W]:

\endminipage%
\endwrapfloat%
}%
% \[M]\:
A figure:

\IfBooleanTF{#1}% starred figure?
\end{figure*}\end{figure}%
}% figure

Unnest the environment:
\addtocounter{KFLT@keyfloatdepth}{-1} \KFLT@envignorespaces%

Before keyfloats Extra code to track rows outside of the keyfloats environment, before it starts. This is done to allow nesting without losing track of the prior level.
\BeforeBeginEnvironment{keyfloats}{\KFLT@trackrows}%

3.26 Subfloats

\KFLT@subgrpdefaults Sets defaults before reading the keys.
\newcommand*{\KFLT@subgrpdefaults}{\setboolean{KFLT@subgrpcont}{false}%
\renewcommand{\KFLT@subgrpc}{\setboolean{KFLT@subgrpcstar}{false}%
\renewcommand{\KFLT@subgrpc}{\setboolean{KFLT@subgrpscgiven}{false}%
\renewcommand{\KFLT@subgrptype}{figure}%
\renewcommand{\KFLT@subgrpl}{\renewcommand{\KFLT@subgrpap}{\renewcommand{\KFLT@subgrpas}{\renewcommand{\KFLT@subgrpaup}{\renewcommand{\KFLT@subgrpaul}{

\end{figure*}\end{figure}}}% figure

\BeforeBeginEnvironment{keyfloats}{\KFLT@trackrows}%

3.26 Subfloats

\KFLT@subgrpdefaults Sets defaults before reading the keys.
Saves the value of \caption@position, which may become unreliable if using \KOMAscript and \captionsetup{table}{position=above}

\newbool{KFLT@subcaptionistop}

\KFLT@subfloats{⟨starred?⟩}{⟨loc⟩}{⟨cols⟩}{⟨keys/values⟩}

Start a subfloat environment

\NewDocumentCommand{\KFLT@subfloats}{m m m +m}{%
\KFLT@envignorespaces%
\setkeys{KFLT@subgrpkeys}{#4}%
\setboolean{KFLT@inkeysubfloats}{true}%
Figure out the width of each subfloat. If starred, use the full-page \textwidth, else use \linewidth. .9 is used to leave a little room between columns.

\IfBooleanTF{#1}{%\setlength{\KFLT@rowboxwidth}{.9\textwidth/\real{#3}}}%\setlength{\KFLT@rowboxwidth}{.9\linewidth/\real{#3}}%

If [H], or in a keywrap, create an inline minipage:

\ifboolexpr{%\test {\ifstreq(#2)(H) or \bool{KFLT@keywrap}}%}{%\vskip\intextsep\noindent\begin{minipage}{\linewidth}%}{%normalcolor\reset@font\normalsize%}%
Not [H]:

\ifstrequal{#2}{W}%
\ifstrequal{#2}{M}%

[W]:
\wrapfloat{.5\linewidth}
\setlength{.5\KFLT@rowboxwidth}
\minipage{.5\linewidth}
\hbadness=10000\relax
\normalcolor

[M]:
\KFLT@marginfloat{.9\marginparwidth/.real{#3}}%
\setlength{.9\marginparwidth/.real{#3}}%

A subfloat:
\IfBooleanTF{#1}%
\begin{KFLT@subgrptype}{#2}%
\begin{KFLT@subgrptype}{#2}%
\end{KFLT@subgrptype}{#2}%
\end{KFLT@subgrptype}{#2}%
\end{KFLT@subgrptype}{#2}%

Set the caption type:
\captionsetup*{type=KFLT@subgrptype}%

Process continued floats:
\ifbool{KFLT@subgrpcont}%
\ContinuedFloat%
\ContinuedFloat%
\ContinuedFloat%
Center the contents:
\center\unskip

Place the caption above the contents depending on caption position option:
\caption@iftop
\booltrue{KFLT@subcaptionistop}\
\boolfalse{KFLT@subcaptionistop}\
\ifbool{KFLT@subcaptionistop}{\KFLT@caption{subgrp}}{}

Not yet started a row of subfloats. The use of \defcounter makes these changes local.
\defcounter{KFLT@numcols}{#3}\
\defcounter{KFLT@thiscol}{0}

Create a group for the subfloats. Necessary in case they change \tdartisttextcenter, etc.
\begingroup
\KFLT@endsubfloats
\KFLT@endsubfloats {\langle starred? \rangle}{\langle loc \rangle}

Ends a subfloat environment.
\newcommand*{\KFLT@endsubfloats}[2]{\endgroup\unskip\endcenter}

\KFLT@endsubfloats

A little extra space at the bottom:
\par\addvspace{\bigskipamount}

Optionally print artist's name and additional text:
\KFLT@addartisttext{subgrp}

Place the caption below the contents depending on caption position option:
\ifbool{KFLT@subcaptionistop}{\KFLT@caption{subgrp}}{\KFLT@caption{subgrp}}
End the float or minipage:

\ifboolexpr{\test{\iffstrequal{#2}{H}} or \bool{KFLT@keywrap} \}%
\end{minipage}\vskip\intextsep
\ifstrequal{#2}{W}\
\endminipage\endwrapfloat
\ifstrequal{#2}{M}\
\endKFLT@marginfloat
\IfBooleanTF{#1}{\end{KFLT@subgrptype*}}{\end{KFLT@subgrptype}}
\setboolean{KFLT@inkeysubfloats}{false}\KFLT@envignorespaces

\KFLT@LWR@hook@keysubfloats Used by lwarp.

\newcommand*{\KFLT@LWR@hook@keysbfloats}{}

Env \KFLT@keysbfloats \langle 1: star? \rangle \langle 2: loc \rangle \langle 3: float type \rangle \langle 4: numcols \rangle \langle 5: keys/values \rangle \langle 6: shared keys/values \rangle

A group of subfigures typeset in rows.

\NewDocumentEnvironment{\KFLT@keysbfloats}{m m m +m m}
Error if trying to nest environments:

A hook for \texttt{l warp} to set \texttt{\textbackslash linewidth}, etc.

Default the options:

Nest the group's keys:

Default to figure float type:

Start of the environment:

end of the environment:

\begin{keysubfloats}[\texttt{loc}]{}{}{}{\texttt{keys/values}}{\texttt{shared keys/values}}
A group of subfloats typeset in rows.

\begin{keysubfigs}[\texttt{loc}]{}{}{\texttt{keys/values}}{\texttt{shared keys/values}}
A group of subfigures typeset in rows.
A group of subtables typeset in rows.

\begin{keysubtabs}[s O{tbp} m +m O{()}]{\KFLT@keysubfloats{#1}{#2}{table}{#3}{#4}{#5}}
\end{KFLT@keysubfloats}

\section{Margin floats}

\begin{KFLT@marginfloat}[\langle offset \rangle][\langle type \rangle]
\begin{lrbox}{\KFLT@marginfloatbox}
\begin{minipage}{\marginparwidth}
\captionsetup{type=#2}
\hbox{}
\vspace*{#1}
\noindent
\normalcolor\reset@font\normalsize
\end{minipage}
\end{lrbox}
\marginpar{\usebox{\KFLT@marginfloatbox}}
\end{KFLT@marginfloat}

Provided in case \texttt{tufte-book} is not loaded:

\begin{marginfigure}[\langle offset \rangle]
\begin{KFLT@marginfloat}[\#1]{figure}
\end{KFLT@marginfloat}

\begin{margintable}[\langle offset \rangle]
\begin{KFLT@marginfloat}[\#1]{table}
\end{KFLT@marginfloat}
3.28 Wrapped floats

**Bool** KFL@keywrap  Tells the next keyfloat to wrap around some text.

\newboolean{KFLT@keywrap}
\boolfalse{KFLT@keywrap}

**Len** KFLT@keywrapwidth  The width of the object to be wrapped beside the text.

\newlength{KFLT@keywrapwidth}

**Len** KFLT@keywrapparskip  The \parskip outside of the keywrap.

\newlength{KFLT@keywrapparskip}

**Len** KFLT@keywrapparindent  The \parindent outside of the keywrap.

\newlength{KFLT@keywrapparindent}

**Env** keywrap  \(\langle\text{width}\rangle\) \{\langle keyfloat\rangle\}

The main text is placed in a minipage to the left, and the wrapped content is later placed in another minipage to the right.

\DeclareDocumentEnvironment{keywrap}{m +m}{%}
\par\noindent
\setlength{KFLT@keywrapwidth}{\linewidth}
\addtolength{KFLT@keywrapwidth}{-#1}
\addtolength{KFLT@keywrapwidth}{-2em}
\minipage[t]{KFLT@keywrapwidth}{%
\setlength{\parskip}{KFLT@keywrapparskip}
\setlength{\parindent}{KFLT@keywrapparindent}
\booltrue{KFLT@keywrap}%
}%
\par
\endminipage
\hfill
\begin{minipage}[t]{#1}
\booltrue{KFLT@keywrap}
\normalcolor\reset@font\normalsize
\hbadness=10000\relax%

Inside this minipage, temporarily prevent underfull hbox warnings:
4 keyfloat package maintenance

To compile the keyfloat documentation from keyfloat.dtx and keyfloat.ins:

```
pdflatex keyfloat.ins
pdflatex keyfloat.dtx
pdflatex keyfloat.dtx
pdflatex keyfloat.dtx
makeindex -s gglo.ist -o keyfloat.gls keyfloat.glo
splitindex keyfloat.idx -- -s gind.ist
pdflatex keyfloat.dtx
pdflatex keyfloat.dtx
```
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