The LaTeX keyfloat Package

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Provides a key/value interface for generating floats.

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 tocdatapackage, 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.

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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 xparse can lead to the general case of:

\onefigure*[loc](width){filename}(add’l 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 \onefigure general case becomes:

\keyfig*[loc](w=width,t={add’l 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.
keysfigs: A table containing a group of rows and columns of subtables.
keysfigs: 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.
marginfigure: A figure environment placed into the margin.\footnote{marginfigure and margintable: The environments provided by the tufte-book class are used if loaded, otherwise keyfloat provides its own versions.}
margintable: 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 keysfigs 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{\textbackslash 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 LOf.
• Additional descriptive text may be added as well.
• Frames may be customized.

\begin{itemize}
\item \textbf{examples} A large number of examples are provided, each showing \LaTeX\ source and the resulting float.
\item \textbf{index} A customized index is included at the back of the documentation.
\item \textbf{margin tags} Blue margin tags are used to help quickly find information, and often indicate the destination of index entries.
\item \textbf{warnings} Several warnings are noted in the text. Watch out for these special cases.
\item \textbf{problems} See the “troubleshooting” section of the index for help with specific problems which may occur.
\end{itemize}
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 \texttt{tocdata} package, load \texttt{tocdata}, optionally followed by either \texttt{tocloft} or \texttt{titletoc}, then \texttt{keyfloat}:

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

To use custom float types with the \texttt{float} package:

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

To use custom float types with the \texttt{newfloat} package:

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

For the \texttt{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 \texttt{cleveref}:

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

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

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

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

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

\keyparbox * [\langle loc \rangle] \{ \langle keys/values \rangle \} \{ \langle box contents \rangle \}
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 * [\langle loc \rangle] \{ \langle keys/values \rangle \}
An environment to generate a figure with arbitrary contents. Useful for multi-paragraph contents. See example 3.

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

Env keyfloat * [\langle loc \rangle] \{ \langle float type \rangle \} \{ \langle keys/values \rangle \}
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 * [\langle loc \rangle] \{ \langle num columns \rangle \}
A group of figures or tables typeset in rows. May be nested, [H], [W], or [M]. See example 15.

Env keysubfigs * [\langle loc \rangle] \{ \langle numcols \rangle \} \{ \langle keys \rangle \}
A group of subfigures typeset in rows. May not be nested. May be [H], [W], or [M]. See example 16.
keyfloat

Env keysubtabs * 
\{⟨loc⟩\} \{⟨numcols⟩\} \{⟨keys⟩\}
A group of subtables typeset in rows. May not be nested. May be [H], [W], or [M]. See example 17.

Env keysubfloats * 
\{⟨loc⟩\} \{⟨float type⟩\} \{⟨numcols⟩\} \{⟨keys⟩\}
A group of subfloats typeset in rows. May not be nested. May be [H], [W], or [M].

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, \keysbfigs, 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.

Arg [loc] The star and [loc] options are ignored for floats inside a keyfloats, keysbfigs, 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 keys** `keyfloats` does not accept any keys at all.

- **artist keys** `ap`, `af`, `a1`, and `as` are only used by figures.

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

- 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]`.

```plaintext
\begin{table}[ht]
\centering
\begin{tabular}{|c|c|}
\hline
\textbf{Key} & \textbf{Description} \\
\hline
\texttt{keyfloats} & Does not accept any keys at all. \\
\hline
\texttt{subfloat keys} & Keys labeled "Sub" may be used for `keysubfigs` and `keysubtabs` environments, which group subfloats under one master float. \\
\hline
\texttt{artist keys} & `ap`, `af`, `a1`, and `as` are only used by figures. \\
\hline
\texttt{stretch key} & Increases space between tabular elements. \\
\hline
\texttt{short/long caption combinations} & Table 2 shows the combinations of `c`, `cstar`, and `sc`. \\
\hline
\texttt{wrapped float placement} & Table 3 shows the wrapped-float placement options for `wp`. \\
\hline
\end{tabular}
\caption{Key and value combinations.}
\end{table}
```
### 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 unstarred 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 <code>LOF/LOT</code>, 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:A name</td>
</tr>
<tr>
<td>ap, aup</td>
<td>●</td>
<td>Artist/author's prefix, such as &quot;Mr.&quot;&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 `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</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>lw</td>
<td></td>
<td>Set the width to a fraction of \linewidth. Cancels w. If a non-image float, sets the width of the text box. For wrapped objects, may be used with w1w 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 w2 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>s</td>
<td></td>
<td>Set the image scale, images only.</td>
<td>s=3</td>
</tr>
<tr>
<td>a</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=I</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>w1w</td>
<td></td>
<td>Sets the total width of the wrapped item to a fraction of \linewidth. May be more than the w or 1w width.</td>
<td>w1w=.6</td>
</tr>
<tr>
<td>w2</td>
<td></td>
<td>Sets the total width of the wrapped item. May be more than the w or 1w width.</td>
<td>w2=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'.</td>
<td>va=t</td>
</tr>
</tbody>
</table>

\(^c\) None of the keys in Part II are used in the keysfigs, keyssubtabs, and keyssubfloats environments.
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</td>
<td>cstar</td>
<td>sc</td>
<td></td>
</tr>
<tr>
<td>•</td>
<td>—</td>
<td>—</td>
<td>Numbered</td>
</tr>
<tr>
<td>•</td>
<td>—</td>
<td>•</td>
<td>Numbered</td>
</tr>
<tr>
<td>—</td>
<td>•</td>
<td>—</td>
<td>Unnumbered</td>
</tr>
<tr>
<td>—</td>
<td>•</td>
<td>•</td>
<td>Unnumbered</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>to the right of the text body</td>
</tr>
<tr>
<td>l</td>
<td>to the left of the text body</td>
</tr>
<tr>
<td>i</td>
<td>to the inside margin</td>
</tr>
<tr>
<td>o</td>
<td>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

\KFLTtightframe \langle contents \rangle Frames the contents without separation.

\KFLTlooseframe \langle contents \rangle Frames the contents with separation.

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

\texttt{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.

\texttt{Len \KFLTlooseframewidth} The computed width of the image. Useful to enclose an \mdframed environment to restrict its width. See example 29.
Some text. More text.
Another paragraph.

Figure 2: A `\keyfigbox`

2.5 Examples

2.5.1 Single floats

Example 1: Figure with an image from a file

Code:

\keyfig{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{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 `\linewidth`, unless `w` or `lw` keys are used.
Figure 3: A keyfigure environment

Table 4: A \keytab table

<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:**

```latex
\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:**

```latex
\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>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
</table>

Arbitrary contents may go here."a

"A footnote.

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}
```

Result:

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
}{image}

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.
Figure 5: Half of \linewidth

Example 7: Using \linewidth

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

Result:
Figure 5

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

lw and w are not used at the same time. If both lw and 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:
Figures 6 and 7 and tables 6 and 7

\begin{tabular}{|c|c|}
\hline
An image. & An image. \\
\hline
Figure 6: Loosely-framed figure & Figure 7: Tightly-framed figure \\
\hline
\end{tabular}

Table 6: Loosely-framed table
\begin{tabular}{|c|c|}
\hline
A & B \\
\hline
C & D \\
\hline
\end{tabular}

Table 7: Tightly-framed table
\begin{tabular}{|c|c|}
\hline
A & B \\
\hline
C & D \\
\hline
\end{tabular}

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

The 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.

\textbf{custom frames} Also see section 2.6.1 for customizing frames.
Table 8: Table, rotated

\begin{tabular}{|c|c|c|c|c|}
\hline
A & B & C & D & E \\
\hline
\end{tabular}

(Framed to show box width.)

Example 9: Using rotation with boxes

Code:

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

Result:

Table 8

- **rotated whitespace**: Unless a width is given, a box is the full \textwidth. When rotated, this extra horizontal space is rotated into extra vertical space. To avoid this extra space, set a \textwidth or \linewidth 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.

- **box width**: Unlike an image, the frame of a box does not rotate with its contents.
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

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

An image.

Figure 8: A keyfig [H]

⚠️ 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 `\clearpage` before or after to re-sync, if necessary.
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 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."

Optional text which is not a caption.

By using [H] and cstar={}, the image is placed inline without a number or \texttt{LOF} entry.
Also see example 14.
Example 14: A box without a caption.

Code:

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

Result: Figure 9, and the box to its left.

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

Example 15: Groups of figures — keyfloats environment

Code:

\begin{keyfloats}{2}
\keyfig{lw=1,f,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}
\keyfig{lw=1,c={Third in a group},
 l=fig:thirdinarow}{image}
\keyfig{lw=1,c={Fourth in a group}}{image2}
\keyfig{lw=1,c={Fifth in a group}}{image}
\keyfig{lw=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

Figure 10 to table 10 are in a keyfloats environment. Furthermore, Figures 11 to 14 are in an additional nested keyfloats environment, forming a small box of floats inside the larger group.

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.

⚠️ linewidth Note that linewidth is adjusted for each row and nested row, so the lw key will need to be changed if a float is moved to a different nesting level.

⚠️ image too large Fixed-width or fixed-height floats may be too large to fit if they are moved into a group. It is the user’s responsibility to adjust w, h, or lw as necessary.

Keyfloats may be located [H], [M], or located [W] set with half the line width:
\begin{keyfloats}[H]{2}...

Keyfloats may be starred to span both columns in a two-column format:
\begin{keyfloats}*{2}...
Figure 10: First in a group

A \keyparbox describing something.

With several paragraphs.

Figure 11: Third in a group

Figure 12: Fourth in a group

Table 10: Seventh in a group

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

Figure 13: Fifth in a group

Figure 14: Sixth in a group
2.5.3 Subfloats

Example 16: Subfigures — keysubfigs environment

Code:

\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=.5,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 \texttt{keysubfigs} or \texttt{keysubtabs} environment). The enclosing float can have its own caption (call “Sub-Figures” in the example), which appears in the \texttt{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 \texttt{LOF/LOT}.

⚠️ \texttt{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.

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

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

Subfloats may be located [H], [M], or located [W] set with half the line width:
\begin{keysubfigs}[H]{3}{key/vals ...}

Subfloats may be starred to span both columns in a two-column format:
\begin{keysubfigs}*{2}{key/vals ...}

\textbf{Example 17: Subtables [H] —} \texttt{keysubtabs} environment

\textit{Code:}
\begin{verbatim}
\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)
\end{verbatim}

\textit{Result:}
\textit{Table 11}

\begin{table}[H]
\centering
\caption{Subtables [H]}
\begin{tabular}{ccc}
\hline
a: First subtable & & b: Second subtable \\
A & B & A & B & C \\
C & D & D & E & F \\
\hline
\end{tabular}
\end{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:**

```
\begin{keyfloats}{2}
\keyfig{,c=Figure to be continued}{image}
\keyfig{c={\ldots 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

Code:

\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={\ldots continued},cont}
\keyfig{c={Third of a set},l=fig:contthird}{image2}
\keyfig{c={Fourth of a set},l=fig:contfourth}{image2}
\end{keysfigs}

Result:

Figure 17
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:**

\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:**

\begin{margintable}
\centering
\textwidthtable
\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:keyboard,ft, t=Additional text. Text text text text text text.}

More paragraphs.

Figure 19: A \keyfig[M]

Result:
Figure 19

Example 23: Using keytable[M] and an offset

Code:
\begin{keytable}[M]{c={A \env{keytable}\optn{[M]}},
  l=tab:keyboard,mo=-.9in}
\centering\textwidetable\end{keytable}

Result:
Table 13

Table 13: A keytable[M]

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

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:**

```latex
\keyfig[W]{c={A \cs{keyfig}\optn{[W]}},
 l=fig:keyfigw,ft, lw=.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>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C</td>
<td>D</td>
</tr>
</tbody>
</table>
Example 25: Using \keyfigbox{} and \keyparbox{}.

Code:

\keyfigbox{}{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 text text text text text text text text text text text text}{The contents.}
\blindtext

\keyparbox{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 \env{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.
\end{keytable}
```

Result:

**Figure 22 and table 15**


<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>E</td>
<td>F</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 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 text text text text text
text text text text text text text.
  \end{keywrap}
  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{itemize}

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:

\begin{figure}
\caption{Keywrap with \keyfig}
\end{figure}

\begin{itemize}
  \item First item. Several lines of text text text text text text text text text text text text.
  \item Second item. Several lines of text text text text text
text text text text text text text 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{itemize}

Outside the \texttt{wrapfig}, 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}
Example 28: Using wrap width \texttt{ww} and \texttt{wlw}

Code:

\begin{verbatim}
\keyfig[W]{c={A \cs{keyfig}\optn{[W] with \optn{wlw}}},
  l=fig:keyfigwlw,ft,lw=.15,ww=.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]
\end{verbatim}

Result:

\textit{Figures 24 and 25}


2.5.8 Custom frames

Example 29: Custom frames with mdframed

Code:

\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.}

Result:
Figures 26 and 27

Example 29 shows custom frames created with the mdframed package along with tikz. Note that mdframed uses the full \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 minipage whose width is precomputed based on the object itself, then set in \KFLTimageboxwidth. Any shadow may fall outside this
Figure 28: Custom shadow

Figure 29: Custom loosely-framed shadow

See section 2.6.1 for more details.

Example 30: Custom shadows with fancybox

Code:

```latex
\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=.5, l=fig:customlooseshadow}{A loosely-framed shadow box.}
```

Result:

Figures 28 and 29

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

See section 2.6.1 for more details.


An image

Mr. First Last III

About the illustration.

Figure 30: Artist’s name — image

Some text, a quotation, a TikZ diagram — anything not an image file.

Mr. Last

Figure 31: Artist’s name — arbitrary contents

2.5.9 Artist’s name

Example 31: Artist’s name — image

Code:
\keyfig{ft,ap=Mr.,af=First,al=Last,as={~III},
tc=\textit{About the illustration.},
c=Artist’s name --- image,l=fig:artist}{image}

Result:
Figure 30

Example 32: Artist’s name — arbitrary contents

Code:
\tdartistright
\begin{keyfigure}{f,ap=Mr.,al=Last,
c=Artist’s name --- arbitrary contents,l=fig:artistpar}
\centering Some text, a quotation, a TikZ\ diagram --- anything not an image file.
\end{keyfigure}
\tdartistcenter

Result:
Figure 31

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 \tocdata package is loaded, the artist’s name is also added to the List of Figures, and the \tdname... macros may be used to align the name.
An image.

a: Artist's First Work

Commentary about the work.

b: Artist's Second Work

Prefix First Last, Suffix

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{keysfigs}{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{keysfigs}

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:

\KFLTtightframe and \KFLTlooseframe

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

Each macro takes one argument and frames it.

Each macro has a associated \LaTeX lengths:

\KFLTtightframewidth and \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 mdframed package, and example 30 for an example created with the 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:

```latex
% 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:

```latex
\@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!%
  }}{}
```

3.2 Prohibited packages

Prohibits the use of a certain other packages.

```latex
\KFLT@prohibitpackage {(packagename)}
```

```latex
\newcommand*{\KFLT@prohibitpackage}[2][]{%
  \@ifpackageloaded[#1]{%
    \PackageError{keyfloat}{%
      The keyfloat package conflicts with the \#1\MessageBreak
      package. Remove \#1 to use keyfloat.\MessageBreak
      Alternative(s):\MessageBreak
      \space\space\#2%
    }{%
      Keyfloat uses the caption, subcaption, newfloat, and wrapfig packages.%
    }}{}
\KFLT@prohibitpackage {(packagename)}
```
Prohibits the use of another package, both now and also \AtBeginDocument.

```
29 \newcommand*{\KFLT@prohibitpackage}[2]{
30 \KFLT@@prohibitpackage{#1}{#2}
31 \AtBeginDocument{\KFLT@@prohibitpackage{#1}{#2}}
32 }
```

The list of prohibited packages:

```
33 \KFLT@prohibitpackage{floatrow}{caption and subcaption}
34 \KFLT@prohibitpackage{subfig}{subcaption}
35 \KFLT@prohibitpackage{subfigure}{subcaption}
36 \KFLT@prohibitpackage{subfloat}{subcaption}
37 \KFLT@prohibitpackage{floatflt}{wrapfig}
```

## 3.3 Required packages

<table>
<thead>
<tr>
<th>Pkg</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>etoolbox</td>
<td>v2.6 or later for \BeforeBeginEnvironment, \AfterEndEnvironment</td>
</tr>
<tr>
<td>xparse</td>
<td>Argument processing:</td>
</tr>
<tr>
<td>keyval</td>
<td>Key processing:</td>
</tr>
<tr>
<td>graphicx</td>
<td>For \includegraphics and rotating:</td>
</tr>
<tr>
<td>caption</td>
<td>Handles all caption-related functions:</td>
</tr>
<tr>
<td>subcaption</td>
<td>Derived from caption, used to handle subfloats:</td>
</tr>
<tr>
<td>calc</td>
<td>Used to compute box width minus frame sep and width.</td>
</tr>
</tbody>
</table>

```
38 \RequirePackage{etoolbox}[2011/01/03]%
39 \RequirePackage{xparse}
40 \RequirePackage{xkeyval}
41 \RequirePackage{graphicx}
42 \RequirePackage{caption}[2010/10/31]% v3.2 to support \phantomcaption
43 \RequirePackage{subcaption}
44 \RequirePackage{calc}
```
Provides rotation via the `turn` environment:

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

Provides `placeins` to process existing floats before adding new ones.

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

Provides figure wrapping code.

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

### 3.4 Patching `wrapfig`

A minor patch to allow `wrapfig` to expand its argument for the number of narrow lines. This allows it to be programmed by `keyfloat`.

\WF@wr will not be defined if using \texttt{lwrap} with \texttt{HTML} output.

```latex
\WF@wr
```

```latex
\ifdef{\WF@wr}
```

```latex
\xpatchcmd{\WF@wr}
```

```latex
\PackageError{keyfloat}{Unable to patch \protect\WF@wr}{Please inform the keyfloat author.}
```

Used by `hyperref` and `nameref`.

Expand names used in titles:

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

Rows of floats are created by a simple \texttt{minipage} environment, instead of relying on a preexisting package. This proved to be advantageous when support was added for multiple rows in one environment.
3.5 In-line figures and tables

These macros are commonly used by others.

Env tablehere Place a table exactly [H].

\ProvidesDocumentEnvironment{tablehere}{}
\% 
\vskip\intextsep
\noindent
\minipage{\linewidth}
\def\@captype{table}
\normalcolor\reset@font\normalsize
\}%
\endminipage\vskip\intextsep

Env figurehere Place a figure exactly [H].

\ProvidesDocumentEnvironment{figurehere}{}
\% 
\vskip\intextsep
\noindent
\minipage{\linewidth}
\def\@captype{figure}
\normalcolor\reset@font\normalsize
\}%
\endminipage\vskip\intextsep

3.6 Row counting and control

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

Ctr KFLT@numcols Columns per row.

\newcounter{KFLT@numcols}

Ctr KFLT@thiscol Column currently processing, $\emptyset$ if not yet in a keyfloats or subfloat.

\newcounter{KFLT@thiscol}

Len \KFLT@rowboxwidth How wide is each box in the row.

\newlength{\KFLT@rowboxwidth}
3.7 Float key handling

\begin{verbatim}
Bool KFLT@cont Continued float?
83 \newboolean{KFLT@cont}

Key [main] cont Continued float?
84 \define@key{KFLT@keys}{cont}{[true]{\setboolean{KFLT@cont}{#1}}}

\KFLT@c Caption storage
85 \newcommand{\KFLT@c}{}

Bool KFLT@cstar Starred caption?
86 \newboolean{KFLT@cstar}

Key [main] c Caption
87 \define@key{KFLT@keys}{c}{%
88 \renewcommand{\KFLT@c}{#1}{\setboolean{KFLT@cstar}{false}}%
89 }

Key [main] cstar Caption starred?
90 \define@key{KFLT@keys}{cstar}{%
91 \renewcommand{\KFLT@c}{#1}{\setboolean{KFLT@cstar}{true}}%
92 }

Key [main] sc Short caption
93 \define@key{KFLT@keys}{sc}{%
94 \renewcommand{\KFLT@sc}{#1}{\setboolean{KFLT@scgiven}{true}}%
95 }

\KFLT@sc Short caption storage
97 \newcommand{\KFLT@sc}{}

Bool KFLT@scgiven Was a short caption given?
98 \newboolean{KFLT@scgiven}
\end{verbatim}
\KFLT@type  Float type: “figure”, “table”  
99 \newcommand*{\KFLT@type}{}

\KFLT@l  Label storage  
101 \newcommand*{\KFLT@l}{}  

For the artist/author keys:  
\KFLT@ap  Storage for artist prefix  
103 \newcommand*{\KFLT@ap}{}

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

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

\KFLT@as  Artist suffix  
108 \define@key{KFLT@keys}{as}{\renewcommand{\KFLT@as}{#1}}
\KFLT@as \quad Storage for artist suffix

\define@key{KFLT@keys}{aup}{\renewcommand{\KFLT@aup}{#1}}
\KFLT@aup \quad Storage for author prefix

\define@key{KFLT@keys}{auf}{\renewcommand{\KFLT@auf}{#1}}
\KFLT@auf \quad Storage for author first name

\define@key{KFLT@keys}{aul}{\renewcommand{\KFLT@aul}{#1}}
\KFLT@al \quad Storage for author last name

\define@key{KFLT@keys}{aus}{\renewcommand{\KFLT@aus}{#1}}
\KFLT@aus \quad Storage for author suffix

\define@key{KFLT@keys}{textalign}{\renewcommand{\KFLT@textalign}{}}
\KFLT@textalign \quad Storage for text alignment.

Used for the additional text in the float.
Additional text storage

Used for the additional text in the float.

\newcommand{\KFLT@t}{}

Create replacement macros in case \texttt{tocdata} is not loaded:

\providecommand{\tdartisttextjustify}{}
\providecommand{\tdartisttextcenter}{}
\providecommand{\tdartisttextleft}{}
\providecommand{\tdartisttextright}{}
\providecommand{\tdauthortextjustify}{}
\providecommand{\tdauthortextcenter}{}
\providecommand{\tdauthortextleft}{}
\providecommand{\tdauthortextright}{}
\providecommand{\tdartistjustify}{}
\providecommand{\tdartistcenter}{}
\providecommand{\tdartistleft}{}
\providecommand{\tdartistright}{}
\providecommand{\tdauthorjustify}{}
\providecommand{\tdauthorcenter}{}
\providecommand{\tdauthorleft}{}
\providecommand{\tdauthorrigh}

\newcommand{\KFLT@keys}{t}%
\renewcommand{\KFLT@t}{#1}%
\renewcommand{\KFLT@textalign}{}

\newcommand{\KFLT@keys}{tc}%
\renewcommand{\KFLT@t}{#1}%
\renewcommand{\KFLT@textalign}{\centering}%

\newcommand{\KFLT@keys}{tr}%
\renewcommand{\KFLT@t}{#1}%
\renewcommand{\KFLT@textalign}{\raggedright}%

\newcommand{\KFLT@keys}{tl}%
\renewcommand{\KFLT@t}{#1}%
\renewcommand{\KFLT@textalign}{\raggedleft}%
Key [main] lw Fraction of \linewideth

\KFLT@lw Fraction of linewidth storage: “.5”

\KFLT@lw

Key [main] w Fixed width

\KFLT@w Width storage: “3cm”

\KFLT@w

Key [main] h Fixed height

\KFLT@h Height storage: “2in”

\KFLT@h

Key [main] s Scale

\KFLT@s Scale storage: “3”

\KFLT@s
keyfloat

Key [main]  \texttt{r} Angle. 90 is counter-clockwise 90 degrees.
\begin{verbatim}
166 \define@key{KFLT@keys}{r}{\renewcommand{\KFLT@r}{#1}}
\end{verbatim}

\texttt{\KFLT@r} Angle storage: “90”
\begin{verbatim}
167 \newcommand*{\KFLT@r}{0}
\end{verbatim}

Key [main]  \texttt{f} Frame the image with \texttt{KFLTlooseframe}.
\begin{verbatim}
168 \define@key{KFLT@keys}{f}[true]{\setboolean{KFLT@f}{#1}}
\end{verbatim}

\texttt{Bool KFLT@f} Frame the image?
\begin{verbatim}
169 \newboolean{KFLT@f}
\end{verbatim}

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

\texttt{Bool KFLT@ft} Tightly frame the image?
\begin{verbatim}
171 \newboolean{KFLT@ft}
\end{verbatim}

Key [main]  \texttt{stretch} Set \texttt{\arraystretch} inside the table environment.
\begin{verbatim}
172 \define@key{KFLT@keys}{stretch}{\renewcommand{\KFLT@stretch}{#1}}
\end{verbatim}

\texttt{\KFLT@stretch} Storage for \texttt{\arraystretch}.
\begin{verbatim}
173 \newcommand*{\KFLT@stretch}{1}
\end{verbatim}

Key [main]  \texttt{mo} Set vertical offset for a margin float.
\begin{verbatim}
174 \define@key{KFLT@keys}{mo}{\setlength{\KFLT@mo}{#1}}
\end{verbatim}

\texttt{\KFLT@mo} Storage for the vertical margin offset.
\begin{verbatim}
175 \newlength{\KFLT@mo}
\end{verbatim}

Key [main]  \texttt{wn} Set wrap number of narrow lines for a wrapped float.
\begin{verbatim}
176 \define@key{KFLT@keys}{wn}{\renewcommand{\KFLT@wn}{#1}}
\end{verbatim}
\KFLT@wn Storage for the wrap placement.

177 \newcommand{\KFLT@wn}{}

Key [main] wp Set wrap placement for a wrapped float.

See table 3 on page 15.

178 \define@key{KFLT@keys}{wp}{\renewcommand{\KFLT@wp}{#1}}

\KFLT@wp Storage for the wrap placement.

179 \newcommand{\KFLT@wp}{0}

Key [main] wo Set wrap overhang for a wrapped float.

180 \define@key{KFLT@keys}{wo}{\renewcommand{\KFLT@wo}{#1}}

\KFLT@wo Storage for the wrap placement.

181 \newcommand{\KFLT@wo}{\wrapoverhang}

\KFLT@wlw Wrapped figure, fraction of \linewidth

182 \define@key{KFLT@keys}{wlw}{\% 183 \renewcommand{\KFLT@wlw}{#1}\% 184 \settowidth{\KFLT@ww}{0pt}\% 185 }

\KFLT@wlw Wrapped figure, fraction of linewidth storage: “.5”

186 \newcommand*{\KFLT@wlw}{}

Key [main] ww Wrapped figure, fixed width

187 \define@key{KFLT@keys}{ww}{\% 188 \settowidth{\KFLT@ww}{0pt}\% 189 \renewcommand{\KFLT@wlw}{}}\% 190 }

\KFLT@ww Wrapped figure, width storage: “3cm”

191 \newlength{\KFLT@ww}
Set vertical alignment of the outermost minipage container.

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

Storage for the vertical alignment.

\newcommand{\KFLT@va}{c}

### 3.8 Nesting control

**Ctr** KFLT@keyfloatdepth Depth inside a keyfigs environment

\newcounter{KFLT@keyfloatdepth}
\setcounter{KFLT@keyfloatdepth}{0}

**Bool** KFLT@inkeysubfloats Inside a keysubfigs environment?

\newboolean{KFLT@inkeysubfloats}
\setboolean{KFLT@inkeysubfloats}{false}

### 3.9 Subfloat key handling

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

**Bool** KFLT@subgrpcont Continued float?

\newboolean{KFLT@subgrpcont}{}

**Key** [subfloat container] cont Continued float

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

\KFLT@subgrpc Sub-caption storage

\newcommand{\KFLT@subgrpc}{}

**Bool** KFLT@subgrpcstart Sub-caption starred?

\newboolean{KFLT@subgrpcstart}
Key [subfloat container] \texttt{c} Caption
\begin{verbatim}
204 \define@key{KFLT@subgrpkeys}{c}{%
205 \renewcommand{\KFLT@subgrpsc}{#1}\setboolean{KFLT@subgrpscgiven}{true}%
206 }
\end{verbatim}

Key [subfloat container] \texttt{cstar} Starred caption?
\begin{verbatim}
207 \define@key{KFLT@subgrpkeys}{cstar}{%
208 \renewcommand{\KFLT@subgrpsc}{#1}\setboolean{KFLT@subgrpscgiven}{true}%
209 }
\end{verbatim}

Key [subfloat container] \texttt{sc} Short caption
\begin{verbatim}
210 \define@key{KFLT@subgrpkeys}{sc}{%
211 \renewcommand{\KFLT@subgrpsc}{#1}\setboolean{KFLT@subgrpscgiven}{true}%
212 }
\end{verbatim}

\texttt{\KFLT@subgrpsc} Sub-shortcaption storage
\begin{verbatim}
214 \newcommand{\KFLT@subgrpsc}{}
\end{verbatim}

\texttt{\KFLT@subgrpscgiven} Sub-shortcaption was given?
\begin{verbatim}
215 \newboolean{KFLT@subgrpscgiven}
\end{verbatim}

\texttt{\KFLT@subgrpstype} Subfloats collection type storage: "figure", "table"
\begin{verbatim}
216 \newcommand*{\KFLT@subgrpstype}{}
\end{verbatim}

Key [subfloat container] \texttt{l} Label
\begin{verbatim}
217 \define@key{KFLT@subgrpkeys}{l}{\renewcommand{\KFLT@subgrpl}{#1}}
218 \newcommand*{\KFLT@subgrpl}{}
\end{verbatim}

\texttt{\KFLT@subgrptextalign} Storage for text alignment.
Used for the additional text in the float.
\begin{verbatim}
219 \newcommand*{\KFLT@subgrptextalign}{}
\end{verbatim}

\texttt{\KFLT@subgrpt} Additional text storage
Used for the additional text in the float.

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

Key [subfloat container]  t  Additional text — full justification

\begin{verbatim}
\define@key{KFLT@subgrpkeys}{t}{%
\renewcommand{\KFLT@subgrpt}{#1}%
\renewcommand{\KFLT@subgrptextalign}{}%
}
\end{verbatim}

Key [subfloat container]  t  Additional text — center justification

\begin{verbatim}
\define@key{KFLT@subgrpkeys}{tc}{%
\renewcommand{\KFLT@subgrpt}{#1}%
\renewcommand{\KFLT@subgrptextalign}{\centering}%
}
\end{verbatim}

Key [subfloat container]  t  Additional text — aligned left

\begin{verbatim}
\define@key{KFLT@subgrpkeys}{tl}{%
\renewcommand{\KFLT@subgrpt}{#1}%
\renewcommand{\KFLT@subgrptextalign}{\raggedright}%
}
\end{verbatim}

Key [subfloat container]  t  Additional text — aligned right

\begin{verbatim}
\define@key{KFLT@subgrpkeys}{tr}{%
\renewcommand{\KFLT@subgrpt}{#1}%
\renewcommand{\KFLT@subgrptextalign}{\raggedleft}%
}
\end{verbatim}

For the \texttt{tocdata} package:

Key [subfloat container]  ap  Artist prefix

\begin{verbatim}
\define@key{KFLT@subgrpkeys}{ap}{\renewcommand{\KFLT@subgrpap}{#1}}
\end{verbatim}

\texttt{\KFLT@subgrpap}  Storage for artist prefix

\begin{verbatim}
\newcommand*{\KFLT@subgrpap}{}
\end{verbatim}

Key [subfloat container]  af  Artist first name

\begin{verbatim}
\define@key{KFLT@subgrpkeys}{af}{\renewcommand{\KFLT@subgrpaf}{#1}}
\end{verbatim}
\KFLT@subgrpa{f} Storage for artist first name

\newcommand*{\KFLT@subgrpa{f}}{}

Key [subfloat container] \texttt{a1} Artist last name

\define@key{KFLT@subgrpkeys}{a1}\{\renewcommand{\KFLT@subgrpal}{#1}}

\KFLT@subgrpal Storage for artist last name

\newcommand*{\KFLT@subgrpal}{}

Key [subfloat container] \texttt{as} Artist suffix

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

\KFLT@subgrpas Storage for artist suffix

\newcommand*{\KFLT@subgrpas}{}

Key [subfloat container] \texttt{aup} Author prefix

\define@key{KFLT@subgrpkeys}{aup}\{\renewcommand{\KFLT@subgrpaup}{#1}}

\KFLT@subgrpaup Storage for author prefix

\newcommand*{\KFLT@subgrpaup}{}

Key [subfloat container] \texttt{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] \texttt{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

251 \define@key{KFLT@subgrpkeys}{aus}\renewcommand{\KFLT@subgrpaus}{#1}

\KFLT@subgrpau Storage for author suffix

252 \newcommand*{\KFLT@subgrpau}{}

3.10 Computing image width

Len \KFLT@imagewidth Computed width of the image

253 \newlength{\KFLT@imagewidth}

Len \KFLT@boxwidth Computed width of the container box

254 \newlength{\KFLT@boxwidth}

Len \KFLT@wrapwidth Computed width of the wrapped figure

255 \newlength{\KFLT@wrapwidth}

\KFLT@findwidths Figure out how wide to make an image and its container

256 \newcommand*{\KFLT@findwidths}{%}

Default to a box of full \linewidth minus the potential frame:

257 \ifbool{KFLT@ft}% tight frame?
258 \settowidth{\KFLT@boxwidth}{\linewidth - 2\KFLT@tframewidth}%
259 \ifesl% not tight frame
260 \ifbool{KFLT@f}% loose frame?
261 \settowidth{\KFLT@boxwidth}{\linewidth - 2\KFLT@lframewidth}%
262 \settowidth{\KFLT@wrapwidth}{\linewidth}% no frame
263 \ifdim% not tight frame

Several width options exist. First see if width was given:

264 \ifdimgreater{\KFLT@w}{0pt}%

Width was given:

265 \settowidth{\KFLT@imagewidth}{\KFLT@w}%
266 \ifdim% width not given
Use full \linewidth or only a fraction:

\ifcsempty{KFLT@lw}\
{\setlength{\KFLT@imagewidth}{\KFLT@boxwidth}}%  
{\setlength{\KFLT@imagewidth}{\KFLT@lw\KFLT@boxwidth}}%  
\}% 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}}%  
\% width not given

If \texttt{wlw}, use a fraction of line width, else if none given use the same as the image width.

\ifcsempty{KFLT@wlw}\
{\setlength{\KFLT@wrapwidth}{\KFLT@imagewidth}}%  
{\setlength{\KFLT@wrapwidth}{\KFLT@wlw\KFLT@boxwidth}}%  
\}% width not given

\ Section 3.11 Framing and rotation

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

\KFLTtightframe may be redefined to a macro which frames its contents. \KFLTtightframewidth should be redefined to the total width of the new frame and its separation.

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

\texttt{Len} \KFLTtightframewidth Must be set to the combined width of the tight frame and separation used by \KFLTtightframe.
A user-redefinable macro and length to loosely frame the contents.

\KFLTlooseframe may be redefined to a macro which frames its contents. \KFLTlooseframewidth should be redefine to the total width of the new frame and its separation.

\KFLTlooseframe \{⟨contents⟩\}

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

\KFLTframe \{⟨contents⟩\}

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

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

KFLT@findenvboxwidth \{⟨contents⟩\}
3.12 A graphics image from a file

\KFLT@onefigureimage \{\langle filename\rangle\}

Create an image with size, frame, and turn.

\NewDocumentCommand{\KFLT@onefigureimage}{m}%
\begin{lrbox}{\KFLT@envbox}%
\Handle the lw key. If lw is used, width and height are ignored.
\ifdefempty{\KFLT@lw}{}% not linewidth
\Handle the w key, which may be used along with the h key:
\ifdefdimgreater{\KFLT@w}{0pt}%
\ifdefdimgreater{\KFLT@h}{0pt}%

Width and height are both given:
\ifdefdimgreater{\KFLT@w}{0pt}%% w and h
\includegraphics[
    scale=\KFLT@s, %
    width=\KFLT@imagewidth, height=\KFLT@h]{#1}%% w and h

Only width:
\ifdefdimgreater{\KFLT@w}{0pt}%
\includegraphics[
    scale=\KFLT@s, width=\KFLT@imagewidth]{#1}%% only w

}% width is given
Width was not given, so maybe handle h alone:

\begin{lrbox}{\KFLT@envbox}
\ifdimgreater{\KFLT@h}{0pt}%
\h was given:
\end{lrbox}
\begin{turn}{\KFLT@r}
\KFLT@frame{\usebox{\KFLT@envbox}}
\end{turn}

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

\begin{lrbox}{\KFLT@envbox}
\ifdimgreater{\KFLT@h}{0pt}%
\end{lrbox}
\begin{turn}{\KFLT@r}
\KFLT@frame{\usebox{\KFLT@envbox}}
\end{turn}

\subsection{Printing the caption}

\NewDocumentCommand{\KFLT@dosimplecaption}{m m m}{% star?
\IfBooleanTF{#1}% star?
{\IfValueTF{#2}{\caption*[#2]{#3}}{\caption*{#3}}}% short cap or -NO VALUE-
{\IfValueTF{#2}{\caption[#2]{#3}}{\caption{#3}}}% caption
\end{lrbox}% unskip
\KFLT@frame{\usebox{\KFLT@envbox}}% unskip
\end{turn}%

There are two versions of \KFLT@docaption, depending on whether tocdata is loaded.

\Ifpackageloaded{tocdata}% tocdata loaded
keyfloat

\KFLT@docaption 1: artist/author \{(2: empty or "u") \} \{(3: star?)\} \{(4: short caption)\} \{(5: caption)\} \{(6: empty or "subgrp")\}

\newcommand*{\KFLT@docaption}[6]{
(\textit{tocdata} does not expand its text argument before checking for empty.)

\addvspace{\smallskipamount}%
\ifcempty{KFLT@#6t}{%
\IfBooleanTF{#3}{%
\csuse{caption#1}*[#4]{#5}%
[\csuse{KFLT@#6t}]{\csuse{KFLT@#6a#2p}}% \csuse{KFLT@#6a#2f}}% \csuse{KFLT@#6a#2l}% \csuse{KFLT@#6s}]{%
\csuse{caption#1}{#5}%
[\csuse{KFLT@#6t}]{\csuse{KFLT@#6a#2p}}% \csuse{KFLT@#6a#2f}}% \csuse{KFLT@#6a#2l}% \csuse{KFLT@#6s}%\)}%
\}%
\}%
\}%
\}%
\ifcsstring{KFLT@#6textalign}{}{\csuse{td#1textjustify}}{}%
\ifcsstring{KFLT@#6textalign}{\centering}{\csuse{td#1textcenter}}{}%
\ifcsstring{KFLT@#6textalign}{\raggedleft}{\csuse{td#1textright}}{}%
\ifcsstring{KFLT@#6textalign}{\raggedright}{\csuse{td#1textleft}}{}%
\IfBooleanTF{#3}{%
\csuse{caption#1}*[#4]{#5}%
[\csuse{KFLT@#6t}]{\csuse{KFLT@#6a#2p}}% \csuse{KFLT@#6a#2f}}% \csuse{KFLT@#6a#2l}% \csuse{KFLT@#6s}]{%
\csuse{caption#1}{#5}%
[\csuse{KFLT@#6t}]{\csuse{KFLT@#6a#2p}}% \csuse{KFLT@#6a#2f}}% \csuse{KFLT@#6a#2l}% \csuse{KFLT@#6s}%\)}%
\}%
\}%
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\}%
\}%}
Depending on whether the \texttt{tocdata} package is present, and an artist is specified, use either \texttt{caption} or \texttt{captionartist}.

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

See Table \ref{tab:imagekeys} for the possible combinations of the caption-related keys: c, cstar, and sc.

With \texttt{tocdata}:
\begin{verbatim}
\NewDocumentCommand{\KFLT@docaption}{s o m m}{% Is the last name empty? Assume no artist if so.
  \ifcsempty{KFLT@#4al}{% figure w/o artist
    \ifcsempty{KFLT@#4aul}{% figure w/o artist or author
      \KFLT@dosimplecaption{#1}{#2}{#3}%; figure w/o artist or author
    }% figure w/ author
    \KFLT@@docaption{artist}{}{#1}{#2}{#3}{#4}%; figure with an artist
  }% figure w/o artist
  \KFLT@docaption{#1}{#2}{#3}{#4}%; no tocdata
}\KFLT@docaption
\end{verbatim}

Without \texttt{tocdata}:
\KFLT@docaption  * \{2:\textit{short caption}\} \{3:\textit{caption}\} \{4: \textit{empty or "subgrp"}\}

\NewDocumentCommand{\KFLT@docaption}{s o m m}{
  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:

\ifcempty{KFLT@#4al}%
  \ifcempty{KFLT@#4aul}%
  \ifcempty{KFLT@#4auf}{%
    \csuse{KFLT@#4aul}\csuse{KFLT@#4auf}\}
  \csuse{KFLT@#4aul}, \csuse{KFLT@#4auf}\}
\%
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\%
A key given as cstar={} yields a float with no caption at all.

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

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

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

cstar was given, so create an unnumbered caption:

Unstarred caption c was given, so number this float:

Optional label:
3.14 Defaults for a new float

\newcommand*{\KFLT@defaults}{% 
\setboolean{KFLT@cont}{false}% 
\renewcommand{\KFLT@c}{}% 
\setboolean{KFLT@cstar}{false}% 
\renewcommand{\KFLT@sc}{}% 
\setboolean{KFLT@scgiven}{false}% 
\renewcommand{\KFLT@type}{figure}% 
\renewcommand{\KFLT@l}{}% 
\renewcommand{\KFLT@ap}{}% 
\renewcommand{\KFLT@af}{}% 
\renewcommand{\KFLT@al}{}% 
\renewcommand{\KFLT@as}{}% 
\renewcommand{\KFLT@aup}{}% 
\renewcommand{\KFLT@auf}{}% 
\renewcommand{\KFLT@aul}{}% 
\renewcommand{\KFLT@aus}{}% 
\renewcommand{\KFLT@t}{}% 
\renewcommand{\KFLT@textalign}{}% 
\renewcommand{\KFLT@lw}{}% 
\setlength{\KFLT@w}{0pt}% 
\setlength{\KFLT@h}{0pt}% 
\renewcommand{\KFLT@s}{1}% 
\renewcommand{\KFLT@r}{0}% 
\setboolean{KFLT@f}{false}% 
\setboolean{KFLT@ft}{false}% 
\renewcommand{\KFLT@stretch}{1}% 
\setlength{\KFLT@mo}{-1.2ex}% 
\renewcommand{\KFLT@wn}{}% 
\renewcommand{\KFLT@wp}{\wrapoverhang}% 
\renewcommand{\KFLT@wo}{\wrapoverhang}% 
\renewcommand{\KFLT@ww}{0pt}% 
\renewcommand{\KFLT@va}{c}% 
}%}

3.15 Row start/end processing

\newcommand*{\KFLT@maybestartfloatrow}{% 
After ending a preexisting row, move to the next row. The use of \defcounter makes this counter change local.

\newcommand*{\KFLT@maybestartfloatrow}{%
Counts rows

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

\begin{verbatim}
\newcommand*{\KFLT@maybeendfloatrow}{% 
  \ifnumless{\value{KFLT@thiscol}}{\value{KFLT@numcols}}{% 
    \par 
    \addvspace{.75\floatsep} 
    \defcounter{KFLT@thiscol}{0} \}
  \}
\end{verbatim}

\subsection{3.16 Key environment helper macros}

Tracks and spaces rows and columns.

\begin{verbatim}
\newcommand{\KFLT@trackrows}{% 
  \ifboolexpr{\ifnumgreater{\value{KFLT@keyfloatdepth}}{0} or\bool{KFLT@inkeysubfloats}{\% } \% 
    \KFLT@maybestartfloatrow \%
  \% nested 
  \% not nested 
\end{verbatim}

Tracks row start and end:

\begin{verbatim}
\KFLT@maybestartfloatrow
\end{verbatim}

Possibly fill space between columns:

\begin{verbatim}
\ifnumgreater{\value{KFLT@thiscol}}{1}{\hfill}{\%
\end{verbatim}
\KFLT@addtext \{\textit{empty or “subgrp”}\}

Adds optional additional text.

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

532 \newcommand{\KFLT@addtext}[1]
533 {%

Is there text to add?

534 \ifcempty{KFLT@#1t}%
535 {}% no text
536 {% text to add
537 { % local

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

538 \addvspace{\smallskipamount}%
539 \begin{minipage}{\linewidth}%

Inside this minipage, temporarily prevent underfull \hbox warnings:

540 \hbadness=10000\relax%

Set the alignment and some text parameters:

541 \csuse{KFLT@#1textalign}%
542 \footnotesize%
543 \setlength{\parskip}{1.5ex}%
544 \setlength{\parindent}{0em}%

Typeset the actual text:

545 \csuse{KFLT@#1t}%

Close it all out with a little more space:

546 \end{minipage}%
547 \par\addvspace{2ex}%
548 }% local
549 )% text to add
550 }%

\KFLT@optionalname \{\textit{name}\}

Adds optional artist's name and the following space.
keyfloat

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

\KFLT@addartisttext\{\textit{empty or “subgrp”}\}

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 tocdata package is available.

If tocdata 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 tocdata is loaded:

\@ifpackageloaded{tocdata}
\ifpackageloaded{tocdata}

If tocdata is loaded:

\newcommand{\KFLT@addartisttext}[1]
\ifcsempty{KFLT@#1al}% artist last name
  \ifcsempty{KFLT@#1aul}% author last name
    \KFLT@addtext{#1}
  {}%
\}%
\}% fig w/ artist: text will be added by \captionartist in \KFLT@caption
\}% KFLT@addartisttext
\}% tocdata loaded

If tocdata is not loaded, the name and text are added here:

\ifpackageloaded{tocdata not loaded}

Factored from \KFLT@addartisttext
Add space and create the name inside a full-width minipage:

\begin{minipage}{\linewidth}

Inside this minipage, temporarily prevent underfull \hbox warnings:

Text alignment is #3, and depends on artist or author:

#1 is empty or 'subgrp'
#2 is empty for artist, 'u' for author:

Any additional text follows the artist's name:
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.

\savebox{\KFLT@envbox}
\NewDocumentEnvironment{KFLT@boxinner}{}

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

\begin{lrbox}{\KFLT@envbox}
\begin{minipage}{\KFLT@imagewidth}
\setlength{\parskip}{2ex}
\renewcommand{\arraystretch}{\KFLT@stretch}
\end{minipage}
\end{lrbox}

End of the environment:

\end{lrbox}

End the rotated box:

\end{turn}

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

\NewDocumentCommand{\KFLT@boxkeys}{+m m}{% \KFLT@defaults% \renewcommand{\KFLT@type}{#2}% \setkeys{KFLT@keys}{#1}% }

Saves the value of \caption@position, which may become unreliable if using KOMA script and

\captionsetup[table]{position=above}

newbool{KFLT@captionistop}

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

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

Env \KFLT@boxouter ({star?}) {loc}

Boxes the contents of figures and floats.

Not used by subfigures.

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

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}{% subfloat

If keyfloats, place the contents inside a minipage:
A hook for \texttt{lwarp} to set \texttt{\linewidth}, etc.

\KFLT@LWR@hook@boxouter%

Not a subfloat or \texttt{keyfloats}, so create a single float.

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

\ifbool{KFLT@keywrap}{}
\par\addvspace{\baselineskip}
\noindent
\minipage[\texttt{t}]{\linewidth}
\captionsetup{type=\KFLT@type}
\}% not a \texttt{keywrap}

See if the float should \texttt{[W]}rap:

\ifstrequal{\texttt{#2}}{\texttt{W}}{}

Place \texttt{[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%
\wrapfloat{\texttt{\KFLT@type}}{\texttt{\KFLT@wn}}{\texttt{\KFLT@wp}}{\texttt{\KFLT@wo}}%
(\texttt{\KFLT@wrapwidth+2\KFLTlooseframewidth})%
\minipage{\texttt{\KFLT@wrapwidth+2\KFLTlooseframewidth}}%

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

\hbadness=10000\relax

\normalcolor\reset@font\normalsize%
keyfloat

Change the interior image to the discovered fixed width.

\renewcommand{\KFLT@lw}{%\KFLT@imagewidth}%
\renewcommand{\KFLT@w}{\KFLT@imagewidth}%
\renewcommand{\KFLT@wlw}{%\KFLT@imagewidth}%
\renewcommand{\KFLT@ww}{0pt}%}

See if the float should be positioned in the \[M]argin:

\ifstrequal{#2}{M}\%

Place \[M], so create a marginfloat:

{\% [M]
  \KFLT@marginfloat[\KFLT@mo]{\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{\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]}%
}{% not \[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 \caption{} position option:
\caption@iftop{\booltrue{KFLT@captionistop}}{\boolfalse{KFLT@captionistop}}%
\ifbool{KFLT@captionistop}\{\KFLT@caption\}%

Typeset the contents:
\center\unskip% boxouter

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:
\ifbool{KFLT@captionistop}\{}{\KFLT@caption{}}%

If are inside keysubtabs, end the subtable:
\ifbool{KFLT@inkeysubfloats}%
{%
\csuse{endsub\KFLT@type}%
}%
\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:

707  \ifbool{KFLT@keywrap}{%
708       \endminipage%
709       \par\addvspace{\baselineskip}%
710   }%
711   {\% not keywrap

See if the float should [W]rap:

712  \ifstrequal(#2){W}%

Place [W], so close the wrap float:

713   {\% [W]
714       \endminipage%
715       \endwrapfloat%
716   }\% [W]
717   {\% not[W]

See if the float should be positioned in the [M]argin:

718  \ifstrequal(#2){M}%

[M], so close the marginfloat:

719   {\% [M]
720       \endKFLT@marginfloat%
721   }\% [M]

[H] or float:

722   {\% not [M]
723       \ifstrequal(#2){H}%
724          {%
725              \endminipage% [H]
726              \vskip\intextsep%
727          }%
728          {\% not [H]
729              \IfBooleanTF{#1}% starred float?
730                 {\csuse{end\KFLT@type*}}%
731                 {\csuse{end\KFLT@type}}%
732          }\% not [H]
733          {\% not [M]
734             {\% not [W]
735             }\% not keywrap

}
3.17 The \KFLT@keyflt macro

\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 \keyfig and \keyflt.

\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}%
\%}
\PackageError{keyfloat}{}%
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.

\endkeyflt Generates an error in case the user tried to use \keyflt as an environment.
3.19 The \texttt{keyfloat} environment

```
\KFLT@keyfloatstart  \{\langle\texttt{star}\rangle\} \{\langle\texttt{loc}\rangle\} \{\langle\texttt{float type}\rangle\} \{\langle\texttt{keys/values}\rangle\}
```

```
\newcommand{\KFLT@keyfloatstart}[4]{% 
  \KFLT@envignorespaces% 
  \KFLT@boxkeys{#4}{#3}% 
  \KFLT@boxouter(#1)(#2)% 
  \KFLT@boxinner% 
}
```

```
\KFLT@keyfloatend
```

```
\newcommand{\KFLT@keyfloatend}{% 
  \endKFLT@boxinner% 
  \endKFLT@boxouter% 
  \KFLT@envignorespaces% 
}
```

```
\NewDocumentEnvironment{keyfloat}{s O{tbp} +m}{% 
  \KFLT@keyfloatstart{#1}{#2}{#3}{#4}%; 
}{% 
  \KFLT@keyfloatend%; 
}
```

Extra code to track rows outside of the \texttt{keyfloat} environment, before it starts. This is done to allow nesting without losing track of the prior level.

```
\BeforeBeginEnvironment{keyfloat}{% 
  \KFLT@trackrows%; 
}
```

3.20 The \texttt{keyfigure} environment

```
\NewDocumentEnvironment{keyfigure}{s O(tbp) +m}{% 
  \KFLT@keyfloatstart(#1)(#2)(#3)(#4)% 
}{% 
  \endKFLT@boxinner% 
  \endKFLT@boxouter% 
  \KFLT@envignorespaces% 
}
```
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.

\begin{Verbatim}
\BeforeBeginEnvironment{keyfigure}{
KFLT@trackrows
}
\end{Verbatim}

3.21 The \texttt{\keyfig} macro

\texttt{\keyfig} \texttt{* \{⟨loc⟩\} \{⟨keys/values⟩\} \{⟨image filename⟩\}}

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

\begin{Verbatim}
\NewDocumentCommand{\keyfig}{s O{tbp} +m m}{
KFLT@keyflt{#1}{#2}{figure}{#3}{%
KFLT@onefigureimage{#4}%
}\endKFLT@keyfltend%
}
\end{Verbatim}

3.22 The \texttt{\keyfigbox} macro

\texttt{\keyfigbox} \texttt{* \{⟨loc⟩\} \{⟨keys/values⟩\} \{⟨box contents⟩\}}

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.

\begin{Verbatim}
\NewDocumentCommand{\keyfigbox}{s O{tbp} +m +m}{
KFLT@ignorespaces
KFLT@trackrows
KFLT@boxkeys{#3}{figure}%
begingroup
KFLT@boxouter{#1}{#2}%
KFLT@boxinner#4%
endKFLT@boxinner%
endKFLT@boxouter%
endgroup
KFLT@ignorespaces%
}
\end{Verbatim}
3.23 The \keyparbox macro

\keyparbox *{⟨loc⟩}{⟨keys/values⟩}{⟨box contents⟩}

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%
  \endgroup%
  \KFLT@ignorespaces%
}%

3.24 The \keytab macro

\keytab *{⟨loc⟩}{⟨keys/values⟩}{⟨tabular contents⟩}

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

\NewDocumentCommand{\keytab}{s O{tbp} +m +m} {%
  \IfBooleanTF{#1}{%
    \keyflt*[#2]{table}{#3}{#4} %
  }{%
    \keyflt{table}{#3}{#4} %
  }%
}%
3.25 The keytable environment

Env keytable * [{⟨loc⟩}]{{⟨keys/values⟩}}

\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}%

3.26 A row of floats

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

\newcommand*{\KFLT@nonest}{%\ifboolexpr{\iffnum\greater\value{\KFLT@keyfloatdepth}{0} or\bool{\KFLT@inkeysubfloats}}{%\PackageError{keyfloat}{Cannot nest keysfigs or keysubtabs.\MessageBreak(Not in outer par mode.)}%\}%)%\PackageError{keyfloat}{Cannot nest keysfigs or keysubtabs.\MessageBreak(Not in outer par mode.)}%}%\MessageBreak\The subcaption package do not support nested environments,\MessageBreak so the keyfloat package cannot place a\MessageBreak keysfigs or keysubtabs environment inside another,\MessageBreak or inside a keyfloats.%}%\MessageBreak}%}%\KFLT@LWR@hook@keyfloats Used by lwarp.
keyfloat

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

Modified by lwarp.

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

Env keyfloats * [⟨loc⟩] {⟨num columns⟩}

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

Place \keyfig, \keyfigbox, and \keytab commands inside the keyfloats environment.

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

\NewDocumentEnvironment{keyfloats}{s O{tbp} m}{%}
\KFLT@envignorespaces%
A hook for lwarp to set \linewidth, etc.
\KFLT@LWR@hook@keyfloats%

Track the depth:
\addtocounter{KFLT@keyfloatdepth}{1}%

If [H], nested, subfloats, or keywrap, use a minipage instead of a float:
\ifboolexpr{%}
  test {\ifstrequal(#2)(H) or test {\ifnum \value{KFLT@keyfloatdepth}[1] or bool {\KFLT@inkeysubfloats} or bool {\KFLT@keywrap} or\}
\}%

Create an inline minipage:
\% [H] or nested
If nested, use different spacing as was computed in the outer nesting level:

\ifboolexpr{%
  test {\ifnumgreater{\value{KFLT@keyfloatdepth}}{1}} or
  bool {KFLT@inkeysubfloats}
}%
%(%\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}%
{}%
]%[H] or nested

Isn’t [H] or nested

(% See if [W]:
\ifstrequal{#2}{W}
%(% [W]:

[W]:

\wrapfloat{figure}{0}{.5\linewidth}%
\minipage{\linewidth}%

Inside this minipage, temporarily prevent underfull \hbox warnings:

\hbadness=10000\relax%
\normalcolor\reset@font\normalsize%
)%%
%(% not [H]:
\ifstrequal{#2}{M}%
%(% [M]:

[M]:


A normal figure:

```
{figure
  \IfBooleanTF{#1}% starred figure, two-col figure in a two-col format
  \begin{figure*}[#2]%
  \begin{figure}[#2]%
  }% figure
}%
```%

Compute the width of each entry:

```
\ifboolexpr{%
test {\ifnumgreater{\value{KFLT@keyfloatdepth}}{1}} or
  \ifstrequal{#2}{H} or rows/subfigs? Close a minipage:
  test {\ifnumgreater{\value{KFLT@keyfloatdepth}}{1}} or
  bool {KFLT@inkeysbfloats}
}%
```%
Spacing if nested or not:

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

Not [H]:

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

\ifstrequal{#2}{M}\% {\[M]\:}{\% figure\%}

A figure:

\IfBooleanTF{#1} starred figure? \%\% \% not [H], etc.

Unnest the environment:
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
}

3.27 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@subgrpsc}{}
\setboolean{KFLT@subgrpscgiven}{false}
\renewcommand{\KFLT@subgrptype}{figure}
\renewcommand{\KFLT@subgrppl}{}
\renewcommand{\KFLT@subgrpap}{}
\renewcommand{\KFLT@subgrpa}{}
\renewcommand{\KFLT@subgrpal}{}
\renewcommand{\KFLT@subgrpas}{}
\renewcommand{\KFLT@subgrpau}{}
\renewcommand{\KFLT@subgrpauf}{}
\renewcommand{\KFLT@subgrpaul}{}
\renewcommand{\KFLT@subgrpaus}{}
\renewcommand{\KFLT@subgrpt}{}
\renewcommand{\KFLT@subgrptextalign}{}
}

\newbool{KFLT@subcaptionistop}

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

Start a subfloat environment
Parse the key-value combinations:
\setkeys{KFLT@subgrpkeys}{#4}

Nest the environment:
\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 {\ifstrequal{#2}{H}} or \bool {KFLT@keywrap}}
{\vskip\intextsep
\noindent\begin{minipage}{\linewidth}
\normalcolor\reset@font\normalsize}
\not[H]:
\ifstrequal{#2}{W}%
{[W]:}
\wrapfloat{KFLT@subgrptype}{O}{.5\linewidth}%
\setlength{\KFLT@rowboxwidth}{.5\KFLT@rowboxwidth}%
\minipage{\linewidth}
Inside this minipage, temporarily prevent underfull \hbox warnings:
\hbadness=10000\relax
\normalcolor\reset@font\normalsize
keyfloat

1046 )%
1047 {% not [H]:
1048 \ifstrequal(#2){M}%
1049 {% [M]:

[M]:

1050 \KFLT@marginfloat{\KFLT@subgrptype}%
1051 \setlength{\KFLT@rowboxwidth}{.9\marginparwidth/\real{#3}}%
1052 )% [M]
1053 {% subfloat

A subfloat:

1054 \IfBooleanTF{#1}%
1055 %{
1056 \begin{\KFLT@subgrptype*}[#2]%
1057 %}
1058 }% not [H]
1059 )%

Set the caption type:

1060 \captionsetup*{type=\KFLT@subgrptype}%

Process continued floats:

1061 \ifbool{KFLT@subgrpcont}%
1062 %{
1063 \ContinuedFloat%
1064 }%

Center the contents:

1064 \center\unskip%

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

1065 \caption@iftop{\booltrue{KFLT@subcaptionistop}}{\boolfalse{KFLT@subcaptionistop}}%\caption@iftop{\KFLT@caption{subgrp}}%

Not yet started a row of subfloats. The use of \defcounter makes these changes local.

1067 \defcounter{KFLT@numcols}{#3}%
1068 \defcounter{KFLT@thiscol}{0}%

Creat a group for the subfloats. Necessary in case they change \tdartisttextcenter, etc.
Ends a subfloat environment.

End the group containing the subfloats:

A little extra space at the bottom:

Optionally print artist's name and additional text:

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

End the float or minipage:
Unnest the environment:

\setboolean{KFLT@inkeysubfloats}{false}\% 
\KFLT@envignorespaces\%

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

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

Env KFLT@keysbfloats {⟨star?⟩} {⟨loc⟩} {⟨float type⟩} {⟨numcols⟩} {⟨keys/values⟩}

A group of subfigures typeset in rows.

\NewDocumentEnvironment{KFLT@keysbfloats}{m m m m +m}{\%}

Error if trying to nest environments:

\KFLT@nonest\%

A hook for lwarp to set \linewidth, etc.

\KFLT@LWR@hook@keysbfloats\%

Default the options:

\KFLT@subgrpdefaults\%

Default to figure float type:

\renewcommand{\KFLT@subgrptype}{#3}\%

Start of the environment:

\KFLT@subfloats{#1}{#2}{#4}{#5}\% the start of the environment
end of the environment:

\begin{KFLT@keysubfloats}{#1}{#2}{#3}{#4}{#5}
\end{KFLT@keysubfloats}

Env \texttt{keysubfloats} * \langle loc \rangle \langle float type \rangle \langle numcols \rangle \langle keys/values \rangle

A group of subfloats typeset in rows.

\NewDocumentEnvironment{keysubfloats}{s O{tbp} m m +m}{% \KFLT@keysubfloats{#1}{#2}{#3}{#4}{#5} \endKFLT@keysubfloats %}

Env \texttt{keysubfigs} * \langle loc \rangle \langle numcols \rangle \langle keys/values \rangle

A group of subfigures typeset in rows.

\NewDocumentEnvironment{keysubfigs}{s O{tbp} m +m}{% \KFLT@keysubfloats{#1}{#2}{figure}{#3}{#4} \endKFLT@keysubfloats %}

Env \texttt{keysubtabs} * \langle loc \rangle \langle numcols \rangle \langle keys/values \rangle

A group of subtables typeset in rows.

\NewDocumentEnvironment{keysubtabs}{s O{tbp} m +m}{% \KFLT@keysubfloats{#1}{#2}{table}{#3}{#4} \endKFLT@keysubfloats %}

3.28 Margin floats

Env \texttt{KFLT@marginfloat} \langle offset \rangle \langle type \rangle

\setbox0\hbox{\KFLT@marginfloatbox}

\newsavebox{\KFLT@marginfloatbox}
Provided in case tufte-book is not loaded:

\begin{KFLT@marginfloat}{⟨offset⟩}{figure}
\end{KFLT@marginfloat}

\begin{KFLT@marginfloat}{⟨offset⟩}{table}
\end{KFLT@marginfloat}

### 3.29 Wrapped floats

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

\begin{KFLT@keywrap}
\end{KFLT@keywrap}

- **Len** KFL@keywrapwidth: The width of the object to be wrapped beside the text.

\begin{KFLT@keywrapwidth}
\end{KFLT@keywrapwidth}

- **Len** KFL@keywrapparskip: The \parskip outside of the keywrap.

\begin{KFLT@keywrapparskip}
\end{KFLT@keywrapparskip}
The \parindent outside of the keywrap.

```
\newlength{\KFLT@keywrapparindent}

\begin{keywrap}{⟨width⟩}{⟨keyfloat⟩}

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

\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}
\endminipage
\hfill\begin{minipage}[t]{#1}
\booltrue{KFLT@keywrap}
\normalcolor\reset@font\normalsize

Inside this minipage, temporarily prevent underfull \hbox warnings:

\hbadness=10000\relax
\setlength{\parskip}{\KFLT@keywrapparskip}
\setlength{\parindent}{\KFLT@keywrapparindent}

\BeforeBeginEnvironment{keywrap}{%
\hfill\begin{minipage}[t]{#1}%
\booltrue{KFLT@keywrap}
\normalcolor\reset@font\normalsize%
```

\BeforeBeginEnvironment{keywrap}{%
# Change History and Index

## Change History

**v0.10**
General: 2016/12/01 Initial ver. 1

**v0.11**
\KFLT@addtext: Improved paragraph handling. 73
General: 2016/12/02 1

**v0.12**
\keyfigbox: Group around contents. 85
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General: 2016/12/09 1
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marginfigure: Added. 98
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KFLT@boxouter: [M] and [W] floats. 77

**v0.13**
\KFLT@subfloats: Fix: Subfloat type selection. 92
General: 2017/01/18 1
\KFLTimageboxwidth: Added. 76
Docs: Other Settings. 1
Fix: Expands names in references. 49

**v0.14**
\KFLT@docaption: Fix: No index entry if no artist given. 68
General: 2017/02/09 1

**v0.15**
\KFLT@subfloats: Adjustments for keywrap. 92
General: 2017/05/12 1
Added vertical alignment key va. 58
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\KFLT@boxouter: Adjustments for keywrap. 77
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Removed xifthen dependency. 48
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**v2.00**
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