The \texttt{\LaTeX} \texttt{keyfloat} Package

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Provides a key/value interface for generating floats.

Abstract

The \texttt{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 $\texttt{\linewidth}$, a fixed width and/or height, rotation, scaling, a tight or loose frame, an $\texttt{\arraystretch}$, a continued float, additional supplemental text, and an artist/author’s name with automatic index entry. When used with the \texttt{tocdata} package, the name also appears in the List of Figures.

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

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

\begin{verbatim}
\keyfig*[hbp]{f,1w=.5,c={A caption},l={fig:label}}{image}
\end{verbatim}

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

See the \texttt{General Index} for an index of topics and troubleshooting.

For the latest updates, see \texttt{Updates}.

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</tbody>
</table>
1 Introduction

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

1.1 A problem with floats

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

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

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

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

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

\onefigure*[loc]{width}{filename}{(add’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 \texttt{\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.
\keysbfigs: A figure containing a group of rows and columns of subfigures.
\keysbtab: A table containing a group of rows and columns of subtables.
\keysbfloats: 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.
\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 keysbfigs or keysbtab 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.

\footnote{\marginfigure and margintable: The environments provided by the tufte-book class are used if loaded, otherwise keyfloat provides its own versions.}
• 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. (\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 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.

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

index A customized index is included at the back of the documentation, including troubleshooting issues.

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

⚠️ warnings Several warnings are noted in the text. Watch out for these special cases.

1.4 Updates

Recent changes include the following:

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

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

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

\textbf{caption and subcaption}: Improved control over captions.

\textbf{floatrow}: A macro-based package for creating floats; including captions, footnotes, and rows of floats.

\textbf{hvfloat}: A key/value system allowing the easy rotation of captions and floats.

\textbf{nccfloats}: Macros for minipage floats and side-by-side floats.

\textbf{newfloat}: Macros for the creation of float environments.

\textbf{rotfloat}: Environments for rotated floats.

\textbf{subfig}: Macros to add subfloats inside a float.
2 Using the keyfloat package

2.1 Loading keyfloat and related packages

keyfloat is loaded with the usual command:

\usepackage{keyfloat}

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

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

To use custom float types with the float package:

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

To use custom float types with the newfloat package:

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

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

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

To use custom float and subfloat types with cleveref:

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

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

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

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

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

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

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

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

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

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

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

Arg [W]
The [W] location wraps text around the float. Use this just before the start of a paragraph with contents large enough to wrap around the float. Do not use this inside a list environment. Select placement with the wp key; see the wrapfig package documentation for more information. Use w or lw to set the width of the item/image contained inside the wrap area. By default the caption will also be contained in this width. To use a larger width for the overall container and caption, set w or lw for the size of the image, and also use ww or wlw 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, keysubfigs, or keysubtabs environment. Note that these container environments may have their own star and [loc] options.
2.3  Keys and values

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

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

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

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

The `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]`.
Table 1: Keys and values — part I

<table>
<thead>
<tr>
<th>Key</th>
<th>Sub$^a$</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 	exttt{LOF/LOT}, even if cstar.</td>
<td>sc={Short cap}</td>
</tr>
<tr>
<td>cont</td>
<td>•</td>
<td>Continued float?</td>
<td>cont</td>
</tr>
<tr>
<td>l</td>
<td>•</td>
<td>The label. Enclose in braces if a comma is included. Ignored in unnumbered floats.</td>
<td>l=fig:alabel</td>
</tr>
<tr>
<td>ap, aup</td>
<td>•</td>
<td>Artist/author's prefix, such as &quot;Mr.&quot;$^b$</td>
<td>ap=Mr.</td>
</tr>
<tr>
<td>af, auf</td>
<td>•</td>
<td>Artist/author's first name.$^b$</td>
<td>af=First</td>
</tr>
<tr>
<td>al, aul</td>
<td>•</td>
<td>Artist/author's last name.$^b$</td>
<td>al=Last</td>
</tr>
<tr>
<td>as, aus</td>
<td>•</td>
<td>Artist/author's suffix, such as &quot;~III.&quot;$^b$</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>

$^a$ All the keys in Part I may be used with the main keys of the 	exttt{keysbfigs}, 	exttt{keysbtable}, and \texttt{keysbfloats} environments.

$^b$ Artist/author keys: \texttt{al} is an artist's last name, \texttt{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 "\texttt{as=}., Title\texttt{)}", for example.
Table 1: Keys and values — part II

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

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

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

a Caption: Shows whether the float will be numbered, unnumbered, or have no caption.
b **LOF/LOT**: Shows whether the regular or short caption will appear in the List of Figures or List of Tables, or if there will be no listing.

Table 3: Key wp: Wrapped float placement options

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

The un-capitalized key attempts to place the float “here”, and the capitalized key allows \TeX{} 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.

\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.

\KFLTlooseframewidth

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

2.5.1 Single floats

Example 1: Figure with an image from a file
Code:
\keyfig{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.
Arbitrary contents may go here.
Including multiple paragraphs.

**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:

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

Result:

*Figure 3*

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

**Example 4: Table macro**

Code:

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

Result:

*Table 4*

Do not try to use tables which overflow the page.
For anything other than a simple table, use the keytable environment. See example 5.

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

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

Arbitrary contents may go here.\footnote{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.}
\testtable
\end{keytable}

Result:

Table 5

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

\keytab centers the table, but keytable does not. Add \centering if desired.
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 tc, tl, or tr instead of t

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.
An image.

Figure 5: Half of $\text{lwidth}$

Example 7: Using $\text{lwidth}$

Code:

```
\keyfig{lw=.5,c=Half of $\text{cs(lwidth)}$,l=fig:lwidth}{image}
```

Result:

Figure 5

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

$\text{lw}$ and $w$ are not used at the same time. If both $\text{lw}$ 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

<table>
<thead>
<tr>
<th>Figure 6: Loosely-framed figure</th>
<th>Figure 7: Tightly-framed figure</th>
<th>Table 6: Loosely-framed table</th>
<th>Table 7: Tightly-framed table</th>
</tr>
</thead>
<tbody>
<tr>
<td>An image</td>
<td>An image</td>
<td>A B</td>
<td>A B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C D</td>
<td>C D</td>
</tr>
</tbody>
</table>

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.

custom frames  Also see section 2.6.1 for customizing frames.
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.)}
{\testwidetable}

Result:

Table 8

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

- **box width**: Unlike an image, the frame of a box does not rotate with its contents.
**Example 10: Located \[H\]ere**

Code:

```latex
\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*

Table 9: A table \[H\]

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<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.
Starred caption with a short caption.

Example 11: Unnumbered float

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

Result:
See fig: "A starred caption".

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

\triangleleft No label

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

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

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

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

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

Code:

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

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

Optional text which is not a caption.

By using [H] and cstar={}, the image is placed inline without a number or LOF entry. Also see example 14.
Some contents.
A \keyparbox with no number or label.

\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 keyfloats.}

\begin{figure}
\centering
\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}
\caption{Figure 9: Next to a \keyparbox}
\end{figure}

\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 keyfloats.}

\begin{figure}
\centering
\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}
\caption{Figure 9, and the box to its left.}
\end{figure}

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

Example 15: Groups of figures — keyfloats environment

Code:

\begin{keyfloats}{2}
\keyfig{lw=1,c={First in a group},
 l=fig:firstinrow,tl={\cs{raggedright} text}}{image}
\keyparbox{}{%centering A \cs{keyparbox} describing something.
 par With several paragraphs.}
\begin{keyfloats}{2}[f,lw=1,h=3em,kar,va=t]
 \keyfig{lw=1,c={Third in a group},
 l=fig:thirdinarow}{image}
 \keyfig{lw=1,c={Fourth in a group, with a longer caption}}{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

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

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. In this subgroup, shared keys are set so that each image is framed and keeps its aspect ratio while being resized to fit a fixed width and height.

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

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

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

A \keyparbox describing something.

With several paragraphs.

\raggedright text

Figure 10: First in a group

Figure 11: Third in a group

Figure 12: Fourth in a group, with a longer caption

Figure 13: Fifth in a group

Figure 14: Sixth in a group

\begin{keyfloats}
\caption{}...
\end{keyfloats}

two columns

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

grid of images

As shown in the sub group above, to display a group of images of varying shape inside a grid, use the shared option to select a maximum size, keep aspect ratio, and align at the top so that captions of varying length may wrap below each image:

\begin{keyfloats}{2}[lw=1,h=3em,kar,va=t]
\caption{}...
\end{keyfloats}

Table 10: Seventh in a group

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

\begin{keyfloats}{1}
  \keyfig{lw=1,f,c={Third subfigure},l=fig:thirdsubfig}{image}
  \keytab{c={Fourth subfigure},l=fig:fourthsubfig}{\testtable}
  \keyfig{lw=.5,f,c={Fifth subfigure},l=fig:fifthsubfig}{image}
\end{keyfloats}

Result:

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

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

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

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

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

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

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

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

---

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

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

**Result:**

*Table 11*

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

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

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

---

Example 18: Continued figure

**Code**:

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

**Result**:

*Figure 16*
2.5.5 Continued subfloats

The `keysfigs` and `keysfigb` 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}\text{(image)}
  \keyfig{c={Second of a set},l=fig:contsecond}\text{(image)}
\end{keysfigs}

\begin{keysfigs}{2}{c={\dots continued},cont}
  \keyfig{c={Third of a set},l=fig:contthird}\text{(image2)}
  \keyfig{c={Fourth of a set},l=fig:contfourth}\text{(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 \texttt{tufte-book} class is used, its \texttt{marginfigure} or \texttt{margintable} environments will be used, otherwise \texttt{keyfloat} provides environments of the same name and uses those instead.

---

\textbf{Example 20: The \texttt{marginfigure} environment}

\texttt{Code:}

\begin{verbatim}
\begin{marginfigure}
\centering
\includegraphics[width=.75\linewidth]{image}
\end{marginfigure}
\end{verbatim}

\texttt{Result:}

\textit{Figure 18}

---

\textbf{Example 21: The \texttt{margintable} environment}

\texttt{Code:}

\begin{verbatim}
\begin{margintable}
\centering
\testwidetable
\caption{A \texttt{env(marginfigure)}
\label{fig:margintable}
\end{margintable}
\end{verbatim}

\texttt{Result:}

\textit{Table 12}

---
Example 22: Using \keyfig[M]

Code:

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

More paragraphs.
}

Result:

Figure 19

---

Table 13: A keytable[M]

<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>

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\ and \keytab\

Code:

\keyfig\{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}.)
}\ Blindtext
\blindtext

\keytab\{c={A \cs{keytab}\optn{[W]}}, l=tab:keytabw, w=.75in,
}\testtable\ Blindtext

Result:

Figure 20 and table 14


Table 14: A \keytab\

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

Example 25: Using \keyfigbox{} and \keyparbox{}\[W\]

Code:

\keyfigbox{}{c={A \cs{keyfigbox} \optn{[W]}},
 l=fig:kefigboxw,f,lw=.25,wp=I, wn=7, 
 t=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{}.

Figure 21: A \keyfigbox{}\[W\]


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

**Code:**

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

**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>

*Table 15: A keytable*

Placed L and 2in wide.

Example 27: Using keywrap with a \keyfig

Code:

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

Result:

\begin{figure}
\centering
\includegraphics[width=\textwidth]{keywrapfig}
\caption{Keywrap with \keyfig}
\end{figure}

• First item. Several lines of text text text text text text text text text text text text.

• Second item. These paragraphs are inside the keywrap. A vertical gap appears below if the text is not enough to fill the space next to the \keyfig.

\begin{notes}
Now outside the keywrap, but still in the second item. There is no elegant way to place only part of a paragraph inside a keywrap.
\end{notes}

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

Code:

\keyfig[W]{c={A \cs{keyfig}\optn{[W] with \optn{wlw}}},
  l=fig:keyupfigwlw,ft,\textwidth=.15,\textwidth=.4,wp=I,
  t={.15\textwidth} wide, in a .4\textwidth box.}
\blindtext[1]

\keyfig[W]{c={A \cs{keyfig}\optn{[W] with \optn{ww}}},
  l=fig:keyupfigww,ft,\textwidth=1cm,\textwidth=3cm,wp=I,
  t={1cm wide, in a 3cm box.}
}\blindtext[1]

Result:

\textit{Figures 24 and 25}


Figure 24: A \keyfig[W] with \texttt{wlw}


Figure 25: A \keyfig[W] with \texttt{ww}

2.5.8 Custom frames

Example 29: Custom frames with \texttt{mdframed}

Code:

\renewcommand{\KFLTtightframe}[1][]{%
\begin{minipage}{\KFLTimageboxwidth}
\begin{mdtightframe}%
#1
\end{mdtightframe}%
\end{minipage}
}%
\setlength{\KFLTtightframewidth}{1pt}

\renewcommand{\KFLTlooseframe}[1][]{%
\begin{mdlooseframe}[leftmargin=.5in,rightmargin=.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 \texttt{mdframed} package along with \texttt{tikz}. Note that \texttt{mdframed} uses the full \texttt{\linewidth} even if the left/right margins are explicitly set, which causes extra vertical space when rotated. Because of this, the framed object is enclosed inside a minipage whose width is precomputed based on the object itself, then set in \texttt{\KFLTimageboxwidth}. Any shadow may fall outside this
Figure 28: Custom shadow

A loosely-framed shadow box.

Figure 29: Custom loosely-framed shadow

box.

See section 2.6.1 for more details.

Example 30: Custom shadows with fancybox

Code:

\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}

\keyfigft,c=Custom shadow,l=fig:customshadow}{image} \keyfigboxf,c=Custom loosely-framed shadow,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.
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.

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

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

Result:

Figure 32

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

2.6.1 Custom frames

There are two user-redefinable framing macros: `\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`
- `\KFLTlooseframewidth`

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

The default definitions are:

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

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

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:

```
\setlength{\floatsep}{5ex plus 1ex minus 1ex}
\setlength{\dblfloatsep}{5ex plus 1ex minus 1ex}
```
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%
    }
  }{%}
  \PackageError{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%
  }{%}
  \PackageError{keyfloat}{%
    Keyfloat uses the caption, subcaption, newfloat, and wrapfig packages.%
  }
}{%}
\KFLT@prohibitpackage{⟨packagename⟩}
```
Prohibits the use of another package, both now and also `\AtBeginDocument`.

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

The list of prohibited packages:

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

### 3.3 Required packages

**Pkg etoolbox**

v2.6 or later for `\BeforeBeginEnvironment, \AfterEndEnvironment`

```latex
\RequirePackage{etoolbox}[2011/01/03]%
```

**Pkg xparse**

Argument processing:

```latex
\RequirePackage{xparse}
```

**Pkg keyval**

Key processing:

```latex
\RequirePackage{xkeyval}
```

**Pkg graphicx**

For `\includegraphics` and `rotating`:

```latex
\RequirePackage{graphicx}
```

**Pkg caption**

Handles all caption-related functions:

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

**Pkg subcaption**

Derived from `caption`, used to handle subfloats:

```latex
\RequirePackage{subcaption}
```

**Pkg calc**

Used to compute box width minus frame sep and width.

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

```
45 \RequirePackage{rotating}
```

Provides to process existing floats before adding new ones.

```
46 \RequirePackage{placeins}
```

Provides figure wrapping code.

```
47 \RequirePackage{wrapfig}
```

Used by `\texttt{hyperref}` and `\texttt{nameref}`.

Expand names used in titles:

```
48 \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.

## 3.4 In-line figures and tables

These macros are commonly used by others.

**Env** `\texttt{tablehere}` Place a table exactly [H].

```
49 \ProvideDocumentEnvironment{tablehere}{}
50 \%
51 \vskip\intextsep\noindent\%
52 \minipage{\linewidth}\%
53 \def\@captype{table}\%
54 \normalcolor\reset\font\normalsize\%
55 \%
56 \endminipage\vskip\intextsep\%
```

**Env** `\texttt{figurehere}` Place a figure exactly [H].


3.5 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. 0 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}

3.6 Float key handling

Bool KFLT@cont

Continued float?

\newboolean{KFLT@cont}

Key [main] cont

Continued float?

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

\KFLT@c Caption storage

\newcommand{\KFLT@c}{}
Starred caption?

\newboolean{KFLT@cstar}

Caption

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

Caption starred?

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

Short caption

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

\KFLT@sc Short caption storage

\newcommand{\KFLT@sc}{}

Was a short caption given?

\newboolean{KFLT@scgiven}

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

\newcommand*{\KFLT@type}{}

Label

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

\KFLT@l Label storage

\newcommand*{\KFLT@l}{}
For the artist/author keys:

**Key [main]** \texttt{ap}  
Artist prefix

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

\KFLT@ap \quad Storage for artist prefix

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

**Key [main]** \texttt{af}  
Artist first name

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

\KFLT@af \quad Storage for artist first name

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

**Key [main]** \texttt{al}  
Artist last name

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

\KFLT@al \quad Storage for artist last name

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

**Key [main]** \texttt{as}  
Artist suffix

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

\KFLT@as \quad Storage for artist suffix

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

**Key [main]** \texttt{aup}  
Author prefix

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

\KFLT@aup \quad Storage for author prefix

\begin{verbatim}
\newcommand*{\KFLT@aup}{}
\end{verbatim}
Key [main] auf  Author first name

97 \define@key{KFLT@keys}{auf}{\renewcommand{\KFLT@auf}{#1}}

\KFLT@auf Storage for author first name

98 \newcommand*{\KFLT@auf}{}

Key [main] aul  Author last name

99 \define@key{KFLT@keys}{aul}{\renewcommand{\KFLT@aul}{#1}}

\KFLT@aul Storage for author last name

100 \newcommand*{\KFLT@aul}{}

Key [main] aus  Author suffix

101 \define@key{KFLT@keys}{aus}{\renewcommand{\KFLT@aus}{#1}}

\KFLT@aus Storage for author suffix

102 \newcommand*{\KFLT@aus}{}

\KFLT@textalign Storage for text alignment.

Used for the additional text in the float.

103 \newcommand*{\KFLT@textalign}{}

\KFLT@t Additional text storage

Used for the additional text in the float.

104 \newcommand{\KFLT@t}{}

Create replacement macros in case tocdata is not loaded:

105 \providecommand{\tdartisttextjustify}{}
106 \providecommand{\tdartisttextcenter}{}
107 \providecommand{\tdartisttextleft}{}
108 \providecommand{\tdartisttextright}{}
109 \providecommand{\tdauthortextjustify}{}
Additional text, justified alignment.

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

Additional text, centered alignment.

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

Additional text, aligned to the right.

\define@key{KFLT@keys}{tr}{
  \renewcommand{\KFLT@t}{#1}\%
  \renewcommand{\KFLT@textalign}{\raggedleft}
}

Additional text, aligned to the left.

\define@key{KFLT@keys}{tl}{
  \renewcommand{\KFLT@t}{#1}\%
  \renewcommand{\KFLT@textalign}{\raggedright}
}

Fraction of \linewidth

\define@key{KFLT@keys}{lw}{
  \renewcommand{\KFLT@lw}{#1}\%
  \setlength{\KFLT@w}{#1}\%
}
\KFLT@lw  Fraction of linewidth storage: “.5”

141 \newcommand*{\KFLT@lw}{}

Key [main]  w  Fixed width
142 \define@key{KFLT@keys}{w}{%
143  \setlength{\KFLT@w}{#1}%
144  \renewcommand{\KFLT@lw}{}%
145 }

\KFLT@w  Width storage: “3cm”

146 \newlength{\KFLT@w}

Key [main]  h  Fixed height
147 \define@key{KFLT@keys}{h}{\setlength{\KFLT@h}{#1}}

\KFLT@h  Height storage: “2in”

148 \newlength{\KFLT@h}

Key [main]  kar  Keep aspect ratio
149 \define@key{KFLT@keys}{kar}[false]{%
150  \renewcommand{\KFLT@keepaspectratio}{keepaspectratio}%
151 }

\KFLT@keepaspectratio  Stores “keepaspectratio” if set.
152 \newcommand{\KFLT@keepaspectratio}{}

Key [main]  s  Scale
153 \define@key{KFLT@keys}{s}{\renewcommand{\KFLT@s}{#1}}

\KFLT@s  Scale storage: “3”

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

Key [main]  r  Angle. 90 is counter-clockwise 90 degrees.
155 \define@key{KFLT@keys}{r}{\renewcommand{\KFLT@r}{#1}}
\KFLT@r  Angle storage: “90”

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

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

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

Bool KFLT@f  Frame the image?

\newboolean{KFLT@f}

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

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

Bool KFLT@ft  Tightly frame the image?

\newboolean{KFLT@ft}

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

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

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

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

Key [main]  mo  Set vertical offset for a margin float.

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

\KFLT@mo  Storage for the vertical margin offset.

\newlength{\KFLT@mo}

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

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

\KFLT@wn  Storage for the wrap placement.

\newcommand{\KFLT@wn}{()}
keyfloat

Key [main] \texttt{wp} Set wrap placement for a wrapped float.
See table 3 on page 16.

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

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

\begin{verbatim}
168 \newcommand{\KFLT@wp}{0}
\end{verbatim}

Key [main] \texttt{wo} Set wrap overhang for a wrapped float.

\begin{verbatim}
169 \define@key{KFLT@keys}{wo}{\renewcommand{\KFLT@wo}{#1}}
\end{verbatim}

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

\begin{verbatim}
170 \newcommand{\KFLT@wo}{\wrapoverhang}
\end{verbatim}

Key [main] \texttt{wlw} Wrapped figure, fraction of \texttt{\linewidth}

\begin{verbatim}
171 \define@key{KFLT@keys}{wlw}{%
172 \renewcommand{\KFLT@wlw}{#1}%
173 \setlength{\KFLT@ww}{0pt}%
174 }
\end{verbatim}

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

\begin{verbatim}
175 \newcommand*{\KFLT@wlw}{}
\end{verbatim}

Key [main] \texttt{ww} Wrapped figure, fixed width

\begin{verbatim}
176 \define@key{KFLT@keys}{ww}{%
177 \setlength{\KFLT@ww}{#1}%
178 \renewcommand{\KFLT@wlw}{}%
179 }
\end{verbatim}

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

\begin{verbatim}
180 \newlength{\KFLT@ww}
\end{verbatim}

Key [main] \texttt{va} Set vertical alignment of the outermost minipage container.

\begin{verbatim}
181 \define@key{KFLT@keys}{va}{\renewcommand{\KFLT@va}{#1}}
\end{verbatim}
3.7 Nesting control

Depth inside a keyfigs environment

\newcommand{\KFLT@keyfloatdepth}{c}

Inside a keysubfigs environment?

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

3.8 Subfloat key handling

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

Continued float?

\newboolean{KFLT@subgrpcont}

Continued float

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

Sub-caption storage

\newcommand{\KFLT@subgrpc}{

Sub-caption starred?

\newboolean{KFLT@subgrpstar}

Caption

\define@key{KFLT@subgrpkeys}{c}[{}{
\renewcommand{\KFLT@subgrpc}{
\setboolean{KFLT@subgrpstar}{false}
}]
}
Starred caption?

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

Short caption

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

Sub-shortcaption storage

\newcommand{\KFLT@subgrpsc}{}

Sub-shortcaption was given?

\newboolean{KFLT@subgrpscgiven}

Subfloats collection type storage: “figure”, “table”

\newcommand*{\KFLT@subgrptype}{}

Label

\define@key{KFLT@subgrpkeys}{l}{\renewcommand{\KFLT@subgrpl}{#1}}

\newcommand*{\KFLT@subgrpl}{}

Storage for text alignment.

Used for the additional text in the float.

\newcommand*{\KFLT@subgrptextalign}{}

Additional text storage

Used for the additional text in the float.

\newcommand{\KFLT@subgrp}{}

Additional text — full justification
Additional text — center justification

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

Additional text — aligned left

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

Additional text — aligned right

\define@key{KFLT@subgrpkeys}{tr} {%
\renewcommand{\KFLT@subgrpt}{#1} \\
\renewcommand{\KFLT@subgrptextalign}{\raggedright}%
\}

For the tocdata package:

\define@key{KFLT@subgrpkeys}{ap} {%
\renewcommand{\KFLT@subgrpap}{#1} \\
\newcommand*{\KFLT@subgrpap}{}%
\}

\KFLT@subgrpap Storage for artist prefix

\define@key{KFLT@subgrpkeys}{af} {%
\renewcommand{\KFLT@subgrpaf}{#1} \\
\newcommand*{\KFLT@subgrpaf}{}%
\}

\KFLT@subgrpaf Storage for artist first name

\define@key{KFLT@subgrpkeys}{al} {%
\renewcommand{\KFLT@subgrpal}{#1} \\
\newcommand*{\KFLT@subgrpal}{}%
\}

\KFLT@subgrpal Storage for artist last name
\KFLT@subgrpal Storage for artist last name
231 \newcommand*{\KFLT@subgrpal}{}

Key [subfloat container] as Artist suffix
232 \define@key{KFLT@subgrpkeys}{as}{\renewcommand{\KFLT@subgrpas}{#1}}

\KFLT@subgrpas Storage for artist suffix
233 \newcommand*{\KFLT@subgrpas}{}

Key [subfloat container] aup Author prefix
234 \define@key{KFLT@subgrpkeys}{aup}{\renewcommand{\KFLT@subgrpaup}{#1}}

\KFLT@subgrpaup Storage for author prefix
235 \newcommand*{\KFLT@subgrpaup}{}

Key [subfloat container] auf Author first name
236 \define@key{KFLT@subgrpkeys}{auf}{\renewcommand{\KFLT@subgrpauf}{#1}}

\KFLT@subgrpauf Storage for author first name
237 \newcommand*{\KFLT@subgrpauf}{}

Key [subfloat container] aul Author last name
238 \define@key{KFLT@subgrpkeys}{aul}{\renewcommand{\KFLT@subgrpaul}{#1}}

\KFLT@subgrpaul Storage for author last name
239 \newcommand*{\KFLT@subgrpaul}{}

Key [subfloat container] aus Author suffix
240 \define@key{KFLT@subgrpkeys}{aus}{\renewcommand{\KFLT@subgrpaus}{#1}}

\KFLT@subgrpaus Storage for author suffix
241 \newcommand*{\KFLT@subgrpaus}{}
3.9 Computing image width

Computed width of the image
\setlength{\KFLT@imagewidth}{\linewidth}

Computed width of the container box
\setlength{\KFLT@boxwidth}{\linewidth - 2\KFLT@ft}

Computed width of the wrapped figure
\setlength{\KFLT@wrapwidth}{\linewidth - 2\KFLT@lw}

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

Default to a box of full \linewidth minus the potential frame:
\ifbool{KFLT@ft}{tight frame?}{% not tight frame
  \setlength{\KFLT@boxwidth}{\linewidth - 2\KFLT@lw}
}\ifbool{KFLT@ff}{loose frame?}{% no frame
  \setlength{\KFLT@boxwidth}{\linewidth}
}

Several width options exist. First see if width was given:
\ifdimgreater{\KFLT@w}{0pt}{% Width was given:
  \setlength{\KFLT@imagewidth}{\KFLT@w}
}\ifcempty{\KFLT@lw}{% width not given
  \setlength{\KFLT@imagewidth}{\KFLT@boxwidth}
}\ifdimgreater{\KFLT@ww}{0pt}{% The wrap width is the same as the image width, unless specified:
  \setlength{\KFLT@wrapwidth}{\KFLT@imagewidth}
}
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.

\% width not given

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

\section{Framing and rotation}

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

\texttt{\KFLTtightframe}: Redefine to a macro which frames its contents.

\texttt{\KFLTtightframewidth}: Redefine to the total width of the new frame and its separation.

\texttt{\KFLTlooseframe}: Redefine to a macro which frames its contents.

\texttt{\KFLTlooseframewidth}: Redefine to the total width of the new frame and its separation.

\KFLTtightframe \langle \textit{contents} \rangle

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

\texttt{\KFLTtightframewidth}\texttt{\LL} \texttt{\KFLTtightframewidth} \texttt{\LL \KFLTtightframewidth} \texttt{\LL \KFLTtightframewidth} \texttt{\LL \KFLTtightframewidth} \texttt{\LL \KFLTtightframewidth}

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

Must be set to the combined width of the tight frame and separation used by \KFLTtightframe.
\KFLTlooseframe \{\langle contents\rangle\}

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

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

\KFLTlooseframewidth

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

\newcommand{\KFLTlooseframewidth}{\setlength{\KFLTlooseframewidth}{3.4pt}}

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

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

\newcommand{\KFLT@frame}[1]{\ifbool{KFLT@ft}{\ifbool{KFLT@f}{\hfuzz=\linewidth\KFLTlooseframe{#1}}{\KFLTlooseframe{#1}}}{\KFLT@findenvboxwidth{\langle contents\rangle}}}
3.11 A graphics image from a file

Used to find the width of a graphics image.

\newlength{\KFLT@testwidth}
\KFLT@includegraphics[⟨keys⟩]{⟨file name⟩}

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

\newcommand*{\KFLT@includegraphics}[2][]{% 
Find the width of the image:
\settowidth{\KFLT@testwidth}{\includegraphics[#1]{#2}}%

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

If close to \linewidth, use slightly less than the \linewidth:
\ifboolexpr{%
  test \ifdimgreater{\KFLT@testwidth}{\linewidth-.01pt} and
  test \ifdimless{\KFLT@testwidth}{\linewidth+1pt}%
}{% 
  \setlength{\KFLT@testwidth}{\linewidth-.01pt}%
}{% 
Issue a warning if wider than the \linewidth:
\ifdimgreater{\KFLT@testwidth}{\linewidth}{% 
  \PackageWarning{keyfloat}{The image is wider than the line width}%
}{% 
Display the image:
\includegraphics[#1]{#2}%}
Create an image with size, frame, and turn.

Several possible combinations of linewidth, width, and height are available, and each is treated separately. Scaling and width/height are done first, then framing, then rotation.

`\KFLT@onefigureimage`\{\filename\}

\begin{lrbox}{\KFLT@envbox}
\KFLT@includegraphics[scale=\KFLT@s, width=\KFLT@imagewidth, height=\KFLT@h, \KFLT@keepaspectratio, ]{#1}
\end{lrbox}

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:

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

Only width:

```
\ifdefempty{\KFLT@lw}{% only w
  \KFLT@includegraphics[scale=\KFLT@s, ]
}
```
Width was not given, so maybe handle h alone:

{% width is not given
\ifdimgreater{\KFLT@h}{0pt}%

h was given:

{% width is not given
\KFLT@includegraphics[%
 scale={\KFLT@s,}%
 height={\KFLT@h,}%
 \KFLT@keepaspectratio,%
 ](#1)%
%
}

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

{% width is not given
\KFLT@includegraphics[%
 scale={\KFLT@s,}%
 \KFLT@keepaspectratio,%
 ](#1)%
%
}%

{% linewidth given
\ifdimgreater{\KFLT@h}{0pt}%
{% lw and h given
 \KFLT@includegraphics[%
 scale={\KFLT@s,}%
 width={\KFLT@imagewidth,}%
 height={\KFLT@h,}%
 \KFLT@keepaspectratio,%
 ](#1)%
}%
%
{% lw w/o h
 \KFLT@includegraphics[%
 scale={\KFLT@s,}%
 width={\KFLT@imagewidth,}%
 \KFLT@keepaspectratio,%
 ](#1)%
}%
3.12 Printing the caption

\KFLT@dosimplecaption \{\langle star?\rangle\} \{\langle short cap or -NO VALUE-\rangle\} \{\langle caption\rangle\}

Calls \caption depending on several combinations of star and short captions being given.

\NewDocumentCommand{\KFLT@dosimplecaption}{m m m}{% 
  \IfBooleanTF{#1}{% star?
    \IfValueTF{#2}{\caption*[#2]{#3}}{\caption*{#3}}
  }{% 
    \IfValueTF{#2}{\caption{#3}}{\caption{#3}}
  }
}

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

\@ifpackageloaded{tocdata}{% tocdata loaded
  \KFLT@@docaption
  \newcommand*{\KFLT@@docaption}[6]{% (tocdata does not expand its text argument before checking for empty.)
    \addvspace{\smallskipamount}
    \ifcsempty{KFLT@#6t}{% 
      \IfBooleanTF{#3}{% 
        \csuse{caption#1}*[#4][#5]
      }{% 
        \csuse{KFLT@#6a#2p]
      }
    }{% 
      \csuse{KFLT@#6a#2f}
    }
  }
}

% 1: artist/author \{\langle 2: empty or "u"\rangle\} \{\langle 3: star?\rangle\} \{\langle 4: short caption\rangle\} \{\langle 5: caption\rangle\} \{\langle 6: empty or "subgrp"\rangle\}

404 \addvspace{\smallskipamount}
405 \ifcsempty{KFLT@#6t}{
406 \csuse{KFLT@#6a#2p]
407 \csuse{KFLT@#6a#2f}
}
Depending on whether the tocdata package is present, and an artist is specified, use either \caption or \captionartist.

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

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

With tocdata:
Is the last name empty? Assume no artist if so.

\ifcempty{KFLT@#4al}\
% figure w/o artist 
\ifcempty{KFLT@#4aul}\
% figure w/o artist or author 

A figure without an artist or author uses the simple caption.

\KFLT@dosimplecaption{#1}{#2}{#3}

A figure with an author uses the \texttt{tocdata} \texttt{\captionauthor} macro, which also creates an index entry.

\KFLT@@docaption{author}{u}{#1}{#2}{#3}{#4}

A figure with an artist uses the \texttt{tocdata} \texttt{\captionartist} macro, which also creates an index entry.

\KFLT@@docaption{artist}{}{#1}{#2}{#3}{#4}

Without \texttt{tocdata}:

\KFLT@docaption  * \texttt{\{\{2:short caption\}\} \{\{3:caption\}\} \{\{4: empty or “subgrp”\}\}}

\NewDocumentCommand{\KFLT@docaption}{s o m m}{%
If \texttt{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}\
{}%
Caption-creation logic.

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

See Table 2 for the possible combinations of the caption-related keys: c, cstar, and sc.
Both cstar and sc were given, so add a `LOF` entry:

\begin{verbatim}
494       {% non-empty cstar and sc:
495           \edef\KFLT@listtype{\csuse{KFLT@#1type}}%
496           \addcontentsline{\csuse{ext@\KFLT@listtype}}%
497             {\csuse{KFLT@#1type}}{\KFLT@sc}%
498       }% non-empty cstar and sc
\end{verbatim}

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

cstar was given, so create an unnumbered caption:

\begin{verbatim}
499       \ifcsempty{KFLT@#1c}%
500           {\KFLT@docaption*{}{#1}}%
501           {\KFLT@docaption*{\csuse{KFLT@#1c}}{#1}}%
502       }%
503   )% starred caption
\end{verbatim}

Unstarred caption c was given, so number this float:

\begin{verbatim}
504       {% unstarred caption
505       \ifcempty{KFLT@#1sc}%
506           {% no short cap
507               \ifcempty{KFLT@#1c}%
508                   {\KFLT@docaption{}{#1}}%
509                   {\KFLT@docaption{\csuse{KFLT@#1c}}{#1}}%
510               }% no short cap
511           {% short cap
512               \ifcempty{KFLT@#1c}%
513                   {\KFLT@docaption[\csuse{KFLT@#1sc}]{#1}}%
514                   {\KFLT@docaption[\csuse{KFLT@#1sc}]{\csuse{KFLT@#1c}}{#1}}%
515               }% short cap
516       }% unstarred caption
\end{verbatim}

Optional label:

\begin{verbatim}
516       \ifcempty{KFLT@#1l}%
517           ()%
518           {\label{\csuse{KFLT@#1l}}}%
519       )% unstarred caption
520   }
\end{verbatim}

### 3.13 Defaults for a new float

\begin{verbatim}
521 \newcommand*{\KFLT@defaults}{%
\end{verbatim}

\KFLT@defaults Defaults all settings before reading the keys.
3.14 Row start/end processing

\texttt{\KFLT@maybestartfloatrow} \texttt{Counts rows}

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

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

\texttt{\KFLT@maybeendfloatrow} \texttt{Counts rows}

\texttt{\newcommand*{\KFLT@maybeendfloatrow}{\KFLT@maybeendfloatrow\ Counts rows}}
Adds vertical space then resets to allow the start of a new row. The use of `\defcounter` makes this counter change local.

```latex
\newcommand*{\KFLT@maybeendfloatrow}{%
  \ifnumless{\value{KFLT@thiscol}}{\value{KFLT@numcols}}%
  {}% thiscol < numcols
  \par%
  \addvspace{.75\floatsep}%
  \defcounter{KFLT@thiscol}{0}%
}%
```

### 3.15 Key environment helper macros

`\KFLT@trackrows` Tracks and spaces rows and columns.

```latex
\newcommand{\KFLT@trackrows}{%
  \ifboolexpr{%
    test {\ifnumgreater{\value{KFLT@keyfloatdepth}}{0}} or%
    bool{KFLT@inkeysubfloats}%
  }{% nested
    Tracks row start and end:
    \KFLT@maybestartfloatrow%
  }{% nested
    Possibly fill space between columns:
    \ifnumgreater{\value{KFLT@thiscol}}{1}%
      \hfill%
    \}
  }{% not nested

  \KFLT@addtext {⟨ empty or “subgrp” ⟩}
  Adds optional additional text.
  The argument is {} if a regular float, or subgrp if keysubfigs or keysubtabs.
```
Is there text to add?

\ifcempty{KFLT@#1t}\%
\{}\% no text
{\% text to add
{\% local

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

\addvspace{\smallskipamount}\%
\begin{minipage}{\linewidth}\%
Inside this minipage, temporarily prevent underfull \hbox warnings:
\hbadness=10000\relax\%

Set the alignment and some text parameters:
\csuse{KFLT@#1textalign}\%
\footnotesize\%
\setlength{\parskip}{1.5ex}\%
\setlength{\parindent}{0em}\%

Typeset the actual text:
\csuse{KFLT@#1t}\%

Close it all out with a little more space:
\end{minipage}\%
\par\addvspace{2ex}\%
{\% text to add
}

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

Adds optional artist's name and the following space.
\KFLT@addartisttext\{(\emph{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 \texttt{tocdata} package is available.

If \texttt{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 \texttt{\KFLT@caption}. Otherwise, the text is printed here.

Two versions, depending on whether \texttt{tocdata} is loaded:

\begin{verbatim}
\@ifpackageloaded{tocdata}
\ifcempty{KFLT@#1al}% artist last name
\ifcempty{KFLT@#1aul}% author last name
\KFLT@addtext{#1}
\else
\KFLT@addartisttext
\end{verbatim}

If \texttt{tocdata} is loaded:

\begin{verbatim}
\newcommand{\KFLT@addartisttext}{%\ifcempty{KFLT@#1al}% artist last name
\ifcempty{KFLT@#1aul}% author last name
\KFLT@addtext{#1}}\end{verbatim}

Only add text if is a figure without an artist or author name. If an artist or author is given, the name and text will be added by \texttt{tocdata}.

\begin{verbatim}
\ifcempty{KFLT@#1al}% artist last name
\ifcempty{KFLT@#1aul}% author last name
\KFLT@addtext{#1}
\else
\KFLT@addartisttext
\end{verbatim}

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

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

Factored from \texttt{\KFLT@addartisttext}

\begin{verbatim}
\newcommand*{\KFLT@@addartisttext}{%\addvspace{\medskipamount}%
\begin{minipage}{\linewidth}%
\end{verbatim}

Add space and create the name inside a full-width minipage:

\begin{verbatim}
\addvspace{\medskipamount}%
\begin{minipage}{\linewidth}%
\end{verbatim}

Inside this minipage, temporarily prevent underfull \hbox warnings:

\hbadness=10000\relax%

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

#3%

#1 is empty or 'subgrp'

#2 is empty for artist, 'u' for author:

\footnotesize\textsc{ }

\KFLT@optionalname{\csuse{KFLT@#1a#2p}}%
\KFLT@optionalname{\csuse{KFLT@#1a#2f}}%
\csuse{KFLT@#1a#2l}%
\csuse{KFLT@#1a#2s}%
%
\end(minipage)%
\par\addvspace{2ex}%
}%
\newcommand{\KFLT@addartisttext}[1]{% Only use the artist information if a last name is given:
\ifcempty{KFLT@#1al}{}% artist last name not given
\ifcempty{KFLT@#1aul}{}% author last name not given
\KFLT@@addartisttext{#1}{u}{\raggedleft}%
}% artist last name given
\KFLT@@addartisttext{#1}{u}{\raggedleft}%
}% artist last name not given
\KFLT@addartisttext{#1}{u}{\raggedleft}%
}% author last name given
\KFLT@addtext{#1}% Any additional text follows the artist's name:
\KFLT@addtext{#1}%
}% KFLT@addartisttext
}% tocdata not loaded

\textsc{Len} \KFLTimageboxwidth

The computed width of the object.

This may be used as the width parameter of a minipage to encase the object.
Typeset the contents in a width which depends on the keys.

\newlength{\KFLTimageboxwidth}
\begin{lrbox}{\KFLT@envbox}
\begin{minipage}{\KFLT@imagewidth}
\setlength{\parskip}{2ex}
\renewcommand{\arraystretch}{\KFLT@stretch}
\end{minipage}
\end{lrbox}
\begin{turn}{\KFLT@r}
\KFLT@frame \rightarrow \fbox{Contents}
\end{turn}
\end{turn}

(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}
\begin{turn}{\KFLT@r}
\KFLT@frame \rightarrow \fbox{Contents}
\end{turn}
\end{turn}

Box the contents in the width computed by \texttt{\KFLT@findwidths}:
\begin{minipage}{\KFLT@imagewidth}
\setlength{\parskip}{2ex}
\renewcommand{\arraystretch}{\KFLT@stretch}
\end{minipage}

Spacing inside the box. Also default to regular justified text alignment.
\setlength{\parskip}{2ex}
\renewcommand{\arraystretch}{\KFLT@stretch}

End of the environment:
\end{minipage}
\end{turn}

End the rotated box:
\end{turn}

Possibly frame:


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

\newcommand*{\KFLT@sharedkeys}{}

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

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

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

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

\newcommand*{\KFLT@LWR@hook@boxouter}{}
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}{}
\csuse{sub\KFLT@type}{\KFLT@rowboxwidth}

If keyfloats, place the contents inside a minipage:

\ifnumgreater{\value{KFLT@keyfloatdepth}}{0}
{\ifbool{KFLT@keywrap}{}
{\minipage[t]{\KFLT@rowboxwidth}{}
\captionsetup*{type=\KFLT@type}
}
{\minipage[\KFLT@va]{\KFLT@rowboxwidth}{}
\captionsetup{type=\KFLT@type}
}
}

A hook for \lwarp to set \linewidth, etc.

\KFLT@LWR@hook@boxouter

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

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

\ifbool{KFLT@keywrap}{
\par\addvspace{\baselineskip}
\noindent
\minipage[t]{\linewidth}
\captionsetup[type=\KFLT@type]
}

See if the float should [W]rap:
Place \([W]\), so create a wrapfloat using the \texttt{wrapfig} package:

\begin{verbatim}
{\[W\]}
\end{verbatim}

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

\begin{verbatim}
\KFLT@findwidths%
\end{verbatim}

Expand the arguments for \texttt{wrapfig}:

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

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

\begin{verbatim}
\hbadness=10000\relax
\normalcolor\reset@font\normalsize
\end{verbatim}

Change the interior image to the discovered fixed width.

\begin{verbatim}
\renewcommand{\KFLT@lw}{}
\renewcommand{\KFLT@w}{\KFLT@imagewidth}
\renewcommand{\KFLT@wlw}{}
\renewcommand{\KFLT@ww}{0pt}
\end{verbatim}

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

\begin{verbatim}
\ifstrequal{\#2}{M}%
\end{verbatim}

Place \([M]\), so create a marginfloat:

\begin{verbatim}
{\[M\]}
\KFLT@marginfloat{\KFLT@mo}{\KFLT@type}%
\end{verbatim}
See if the float should be positioned \[H\]ere:

\ifstrequal{#2}{H}{%
\vskip\intextsep
\noindent\minipage[\KFLT@va]{\linewidth}%
\normalcolor\reset@font\normalsize%
\captionsetup{type=\KFLT@type}%
}%

Place \[H\], so create an inline minipage:

\begin{minipage}[\KFLT@va]{\linewidth}
\normalcolor\reset@font\normalsize
\captionsetup{type=\KFLT@type}%
\end{minipage}

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

\IfBooleanTF{#1}{\csuse{\KFLT@type*}[#2]}{\csuse{\KFLT@type}[#2]}%

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%
End of the KFLT@boxouter environment:

754{% endboxouter
755 \endcenter\unskip%
756 \addvspace{\smallskipamount}%

Optionally print artist's name and additional text:

757 \KFLT@addartisttext()%

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

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

If are inside keysubtabs, end the subtable:

759 \ifbool{KFLT@inkeysubfloats}%
760 {% \csuse{endsub\KFLT@type}%
761 % subfloat
762 {% not subfloat
763 \ifnumgreater{\value{KFLT@keyfloatdepth}}{0} keyfloats?
764 {%
765 \endminipage%
766 % keyfloats
767 {% not keyfloats

Not subfloat or keyfloats, so is an individual float.

Close the minipage or float:

See if in a keywrap:

769 \ifbool{KFLT@keywrap}%
770 \endminipage%
771 \par\addvspace{\baselineskip}%
772 %
773 {% not keywrap

See if the float should [W]rap:

774 \ifstrequal(#2){W}%

Place [W], so close the wrap float:

775 {% [W]}
keyfloat

\endminipage%
\endwrapfloat%
}% [W]
{% not[W]

See if the float should be positioned in the [M]argin:
\ifstrequal{#2}{M}%

[M], so close the marginfloat:
{% [M]
\endKFLT@marginfloat%
}% [M]

[H] or float:
{% not [M]
\ifstrequal{#2}{H}%
{% [H]
\endminipage% [H]
\vskip\intextsep%
}% [H]
{% not [H]
\IfBooleanTF{#1}% starred float?
{% not[H]
\csuse{end\KFLT@type*}}%
\csuse{end\KFLT@type}}%
}% not [H]
}% [M]
}% not [W]
}% not keywrap
}% not keyfloats
}% not subfloat
}% endkeyboxouter

\KFLT@ignorespaces \langle\text{commandname}\rangle Only do command if not nested inside something.
\newcommand*{\KFLT@ignorespaces}[1]{% \ifboolexpr{% test {\ifnumgreater{\value{KFLT@keyfloatdepth}}{0}} or% bool(KFLT@inkeysubfloats)% }
{}{\csuse{#1}}%
}%

\KFLT@ignorespaces Only \ignorespaces if not nested inside something.
\newcommand*{\KFLT@ignorespaces}{%
3.16 The \KFLT@keyflt macro

\KFLT@keyflt {⟨1:star⟩} {⟨2:loc⟩} {⟨3:type⟩} {⟨4:keys/values⟩} {⟨5:contents⟩}

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

3.17 The \keyflt macro

\keyflt * [{⟨loc⟩}] {⟨type⟩} {⟨keys/values⟩} {⟨contents⟩}
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.

\keyflt
\KFLT@keyflt
\KFLT@boxouter
\KFLT@boxinner
\KFLT@frame → \fbox
\fbox
minipage
Contents

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

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

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

\usepackage{keyfloat}

\begin{keyfloat}{\textbf{Star}}{loc}{float type}{keys/values}

\end{keyfloat}

3.18 The keyfloat environment

\begin{keyfloatstart} {\textit{star?}} {\textit{loc}} {\textit{float type}} {\textit{keys/values}}

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

Env \texttt{keyfloat} * [⟨loc⟩] {⟨float type⟩} {⟨keys/values⟩}

\begin{tikzpicture}
  \node (keyfloat) {\texttt{keyfloat}};
  \node (keyfloatstart) [below of=keyfloat] {\texttt{\KFLT@keyfloatstart, \KFLT@keyfloatend}};
  \node (boxouter) [below of=keyfloatstart] {\texttt{\KFLT@boxouter}};
  \node (boxinner) [below of=boxouter] {\texttt{\KFLT@boxinner}};
  \node (frame) [below of=boxinner] {\texttt{\KFLT@frame} \rightarrow \fbox};
  \node (turn) [below of=frame] {\texttt{turn}};
  \node (minipage) [below of=turn] {\texttt{minipage}};
  \node (contents) [below of=minipage] {\texttt{Contents}};
\end{tikzpicture}

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

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

\BeforeBeginEnvironment{keyfloat}{% 
  \KFLT@trackrows% 
}
3.19 The keyfigure environment

\begin{keyfigure}{[\langle loc\rangle]}{\langle keys/values\rangle}

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

3.20 The \texttt{\keyfig} macro

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

A user-level macro to generate a figure with an image. This may be used by itself, or inside a keyfloats or keysubfigs environment.
If \texttt{keysubfloats}: Uses a subfigure.

If [H], \texttt{keyfloats}, or inside a \texttt{keywrap}: Uses a minipage.

If [W]: Uses a \texttt{wrapfloat} from the \texttt{wrapfig} package.

If [M]: Uses a \texttt{KFLT@marginfloat}.

Otherwise: Uses a figure.

\begin{verbatim}
\KFLT{#1}{#2}{figure}{#3}{\KFLT@onefigureimage{#4}}
\end{verbatim}

\subsection{The \texttt{\keyfigbox} macro}

\texttt{\keyfigbox} \[ ⟨loc⟩ \] {⟨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 \texttt{keyfloats} or \texttt{keysubtabs} environment.
3.22 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.

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 %
```
3.23 The \keytab macro

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

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

3.24 The keytable environment

\keytable * [{\langle loc\rangle}]\{\langle keys/values\rangle\}
3.25 A row of floats

Error message if tried to nest subfloats.

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

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

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

\KFLT@LWR@hook@keyfloatsminipage \(\langle\text{contents}\rangle\)

Modified by lwarp.

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

Env keyfloats * \[\langle\text{loc}\rangle\] \[\langle\num columns\rangle\] \[\langle\text{shared keys/values}\rangle\]

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

If [H], nested, subfloats, or keywrap: Uses a minipage.
If [W]: Uses a wrapfloat.
If [M]: Uses \KFLT@marginfloat.
Otherwise: Uses a figure.

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

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

Nest the group's keys.
\edef\KFLT@outersharedkeys{\KFLT@sharedkeys}%
\edef\KFLT@sharedkeys{\KFLT@sharedkeys,#4}%

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

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}
}%
Use the keys from the outer container. Expansion required for \texttt{xkeyval}.

\edef\next{\noexpand\setkeys{KFLT@keys}{\KFLT@outersharedkeys}}\next

Create the containing minipage:

\KFLT@LWR@hook@keyfloatsminipage{\KFLT@rowboxwidth}\%

\vskip\intextsep

\KFLT@LWR@hook@keyfloatsminipage{\linewidth}\%

Reset font and color:

\normalcolor\reset@font\normalsize

If inside subfloats, generate subfigures by default:

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

Isn't \[H\] or nested

\ifstrequal{#2}{W}\%
\wrapfloat{figure}{O}{.5\linewidth}\%
\minipage{\linewidth}\%

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

\hbadness=10000\relax

\normalcolor\reset@font\normalsize\%
\ifstrequal{#2}{M}\%
\captionsetup*{type=figure}\%

\ifstrequal{#2}{M}\%
\captionsetup*{type=figure}\%

\ifstrequal{#2}{M}\%
\captionsetup*{type=figure}\%


A normal figure:

\begin{figure*}[H]
\begin{figure}[H]
\end{figure*}
\end{figure}

\end{figure}

Compute the width of each entry:

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

Keyfloats:

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

Center the contents:

\centering

Count columns using \defcounter for a local effect:

\defcounter{KFLT@numcols}{#3}
\defcounter{KFLT@thiscol}{0}

When ending a keyfloats environment:

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

1031 \test{\ifstrequal{#2}{H}}\ or
1032 \test{\ifnumgreater{\value{KFLT@keyfloatdepth}}{1}}\ or
1033 \bool{\KFLT@inkeysbfloats}\ or
1034 \bool{\KFLT@keywrap}
1035 \%
1036 (% was [H], etc.
1037 \endKFLT@LWR@hook@keyfloatsminipage%
1038 \%

Spacing if nested or not:

1039 \iftboolexpr{
1040 \test{\ifnumgreater{\value{KFLT@keyfloatdepth}}{0}}\ or
1041 \bool{\KFLT@keywrap}
1042 \}%
1043 ()% not nested
1044 \vskip\intextsep%
1045 \}%
1046 \}% was [H], etc.

Not [H]:

1047 (% not [H], etc.
1048 \ifstrequal{#2}{W}%
1049 (% [W]:

[W]:

1050 \endminipage%
1051 \endwrapfloat%
1052 %
1053 (%
1054 \ifstrequal{#2}{M}%
1055 (% [M]:

[M]:

1056 \endKFLT@marginfloat%
1057 %
1058 (% figure

A figure:

1059 \IfBooleanTF{#1}% starred figure?
1060 \end{figure*}(%(end(figure*))\end{figure}%
1061 %
1062 %)
1063 % not [H], etc.
Unnest the environment:

\addtocounter{KFLT@keyfloatdepth}[-1]%
\KFLT@envignorespaces%
}

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

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

3.26 Subfloats

\KFLT@subgrpdefaults Sets defaults before reading the keys.

\newcommand*{\KFLT@subgrpdefaults}{%
\setboolean{KFLT@subgrpcont}{false}%
\renewcommand{\KFLT@subgrpc}{}%
\setboolean{KFLT@subgrpcstar}{false}%
\renewcommand{\KFLT@subgrpsc}{}%
\setboolean{KFLT@subgrpscgiven}{false}%
\renewcommand{\KFLT@subgrptype}{figure}%
\renewcommand{\KFLT@subgrpl}{}%
\renewcommand{\KFLT@subgrpap}{}%
\renewcommand{\KFLT@subgrfa}{}%
\renewcommand{\KFLT@subgrpal}{}%
\renewcommand{\KFLT@subgrpas}{}%
\renewcommand{\KFLT@subgrpaup}{}%
\renewcommand{\KFLT@subgrpauf}{}%
\renewcommand{\KFLT@subgrpaul}{}%
\renewcommand{\KFLT@subgrpaus}{}%
\renewcommand{\KFLT@subgrpt}{}%
\renewcommand{\KFLT@subgrptextalign}{}%
}%

Bool KFLT@subcaptionistop Saves the value of \caption@position, which may become unreliable if using KomaScript and

\captionsetup[table]{position=above}
\newbool{KFLT@subcaptionistop}

\KFLT@subfloats {{\starred?}} {{\loc}} {{\cols}} {{\keys/values}}
Start a subfloat environment

\NewDocumentCommand{\KFLT@subfloats}{m m m +m}{%}
\KFLT@envignorespaces%

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}\
ormalcolor\reset@font\normalsize%

Not [H]:
\ifstrequal{#2}{W}%
{ [% W]}

Inside this minipage, temporarily prevent underfull \hbox warnings:

\badness=10000\relax
\normalcolor\reset@font\normalsize

A subfloat:
\IfBooleanT{#1}{
  \begin{#2}
  \end{#2}
}
\IfBooleanF{#1}{\IfBooleanT{#2}{\begin{#2}.}{\begin{#2}}}
%

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

Process continued floats:
\ifbool{KFLT@subgrpcont}{\ContinuedFloat}{\ContinuedFloat}

Center the contents:
\center\unskip

Place the caption above the contents depending on \caption position option:
Not yet started a row of subfloats. The use of \defcounter makes these changes local.

Creat a group for the subfloats. Necessary in case they change \td_artist{textcenter}, etc.

\begingroup
\KFLT@endsubfloats {⟨\starred?⟩} {⟨loc⟩}

Ends a subfloat environment.

\newcommand*{\KFLT@endsubfloats}[2]{% 
  End the group containing the subfloats:
  \endgroup
  \unskip
  \endcenter
  A little extra space at the bottom:
  \par\addvspace{\bigskipamount}
  Optionally print artist' s name and additional text:
  \KFLT@addartisttext{subgrp}
  Place the caption below the contents depending on caption position option:
  \ifbool{\KFLT@subcaptionistop}{}{\KFLT@caption{subgrp}}
  End the float or minipage:
  \ifboolexpr{% 
    test {\ifstreq(#2)\text{(H)}} or
    bool(\KFLT@keywrap)
  }{\end{minipage}\vskip\intextsep}{\KFLT@addartisttext{subgrp}}
Unnest the environment:

\setboolean{KFLT@inkeysubfloats}{false} %
\KFLT@envignorespaces
\KFLT@LWR@hook@keysubfloats

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

\texttt{\KFLT@keys/subfloats} \texttt{\{1: star?\} \{2: loc\} \{3: float type\} \{4: numcols\} \{5: keys/values\} \{6: shared keys/values\}}

A group of subfigures typeset in rows.
\NewDocumentEnvironment{KFLT@keysubfloats}{m m m m +m m}{\KFLT@subfloats, \KFLT@endsubfloats
\If[H] or keywrap: Uses a minipage.
\If[W]: Uses a wrapfloat and a minipage.
\If[M]: Uses \KFLT@marginfloat.
Otherwise: Uses a subfigure, etc.
\KFLT@endsubfloats{#1}{#2}{#4}{#5}}% the start of the environment
\KFLT@endsubfloats{#1}{#2}%
\end of the environment:
%}
A group of subfloats typeset in rows.

\begin{keysubfloats}[s O{tbp} m m +m O{}]
  \KFLT@keysubfloats{#1}{#2}{#3}{#4}{#5}{#6}
  \endKFLT@keysubfloats
\end{keysubfloats}

A group of subfigures typeset in rows.

\begin{keysubfigs}[s O{tbp} m +m O{}]
  \KFLT@keysubfloats{#1}{#2}{figure}{#3}{#4}{#5}
  \endKFLT@keysubfloats
\end{keysubfigs}

A group of subtables typeset in rows.

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

\section{Margin floats}

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

Provided in case tufte-book is not loaded:

Env marginfigure \[ ⟨offset⟩ \]

\begin{marginfigure}
\begin{lrbox}{\KFLT@marginfloatbox}
\begin{minipage}{\marginparwidth}
\captionsetup{type=figure}
\hbox{}
\vspace*{#1}
\noindent
\normalcolor\reset@font\normalsize
\end{minipage}
\end{lrbox}
\marginpar{\usebox{\KFLT@marginfloatbox}}
\KFLT@envignorespaces
\end

Env margintable \[ ⟨offset⟩ \]
3.28 Wrapped floats

Tells the next keyfloat to wrap around some text.

<table>
<thead>
<tr>
<th>Bool</th>
<th>KFL@keywrap</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Len</th>
<th>KFLT@keywrapwidth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The width of the object to be wrapped beside the text.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Len</th>
<th>KFLT@keywrapparskip</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The \parskip outside of the keywrap.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Len</th>
<th>KFLT@keywrapparindent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The \parindent outside of the keywrap.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Env</th>
<th>keywrap</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>\langle \textit{width} \rangle \langle \textit{wrapped content} \rangle</td>
</tr>
</tbody>
</table>

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

\begin{verbatim}
\DeDeclareDocumentEnvironment{keywrap}{m +m}{% \par\noindent% \setlength{KFLT@keywrapwidth}{\linewidth}% \addtolength{KFLT@keywrapwidth}{-#1}% \addtolength{KFLT@keywrapwidth}{-2em}% \minipage[t]{KFLT@keywrapwidth}{% \setlength{\parskip}{KFLT@keywrapparskip}% \setlength{\parindent}{KFLT@keywrapparindent}% \booltrue{KFLT@keywrap}%
| minipage |
| \hfill |
| minipage |

Main text.  
Multiple paragraphs.  
\hfill

Wrapped content.
\end{verbatim}
Inside this minipage, temporarily prevent underfull \hbox warnings:

\hbadness=10000\relax

#2\par\unskip\vspace{\smallskipamount}\end{minipage}\par

\BeforeBeginEnvironment{keywrap}{% 
\setlength{\KFLT@keywrapparskip}{\parskip}% 
\setlength{\KFLT@keywrapparindent}{\parindent}% }
4 keyfloat package maintenance

To compile keyfloat.sty and keyfloat.pdf from keyfloat.dtx and keyfloat.ins:

\texttt{pdflatex keyfloat.ins}
\texttt{pdflatex keyfloat.dtx}
\texttt{pdflatex keyfloat.dtx}
\texttt{pdflatex keyfloat.dtx}
\texttt{makeindex -s gglo.ist -o keyfloat.gls keyfloat.glo}
\texttt{splitindex keyfloat.idx -- -s gind.ist}
\texttt{pdflatex keyfloat.dtx}
\texttt{pdflatex keyfloat.dtx}
## Change History

For the most recent changes, see page 111.

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>v0.10</td>
<td>2016/12/01</td>
<td>Initial ver.</td>
</tr>
<tr>
<td>v0.11</td>
<td></td>
<td>\KFLT@addtext: Improved paragraph handling.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>General: 2016/12/02</td>
</tr>
<tr>
<td>v0.12</td>
<td></td>
<td>\keyfigbox: Group around contents.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\keyflt: Group around contents.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>General: 2016/12/09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\KFLT@docaption: Factored.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\KFLT@caption: Generalized for float type.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\KFLT@caption: Added support for authors.</td>
</tr>
<tr>
<td>v0.13</td>
<td></td>
<td>\KFLT@subfloats: Fix: Subfloat type selection.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>General: 2017/01/10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\endkeyflt: Added.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\keyfig: Factored.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\keyflt: Added.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\keytab: Factored.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\KFLT@endsubfloats: Added</td>
</tr>
<tr>
<td>v0.14</td>
<td></td>
<td>\KFLT@docaption: Factored.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>if no artist given.</td>
</tr>
<tr>
<td></td>
<td></td>
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