

# The L<sup>A</sup>T<sub>E</sub>X keyfloat Package

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Provides a key/value interface for generating floats.

## Abstract

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

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

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

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

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



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

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# 1 Introduction

The `keyfloat` package simplifies the creation of L<sup>A</sup>T<sub>E</sub>X floats, while still allowing a large number of useful features.

## 1.1 A problem with floats

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

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

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

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

Expanding the capability of `\onefigure` via `xparse` can lead to the general case of:

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

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

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

## 1.2 The `keyfloat` package

Using `keyfloat`, the previous example becomes:

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

The `\onefigure` general case becomes:

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

### 1.3 Features

The macros and environments provided by `keyfloat` include:

**`\keyfig`**: A figure with an image.

**`\keytab`**: A table.

**`\keyflt`**: An arbitrary float type macro.

**`\keyfigbox`**: A figure with arbitrary contents.

**`\keyparbox`**: A “figure” without a caption, useful to place uncaptioned text inside a group,

**`keyfigure`**: A figure environment.

**`keytable`**: A table environment.

**`keyfloat`**: An arbitrary float type environment.

**`keyfloats`**: A group of rows and columns of floats.

**`keysubfigs`**: A figure containing a group of rows and columns of subfigures.

**`keysubtabs`**: A table containing a group of rows and columns of subtables.

**`keysubfloats`**: 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.<sup>1</sup>

**`marginable`**: 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 `keysubfigs` or `keysubtabs` 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.

---


<sup>1</sup>`marginfigure` and `marginable`: 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 L<sup>A</sup>T<sub>E</sub>X source and the resulting float.

**index** A customized index is included at the back of the documentation.

**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.

**problems** See the “troubleshooting” section of the index for help with specific problems which may occur.



## 2 Using the keyfloat package

### 2.1 Loading keyfloat and related packages

keyfloat is loaded with the usual command:

```
\usepackage{keyfloat}
```

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

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

Pkg newfloat To use custom float types, use the newfloat package:

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

Pkg caption 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}
}
```

Pkg cleveref To use custom float and subfloat types with cleveref:

```
\usepackage{cleveref}
\crefname{diagram}{diagram}{diagrams}
\crefname{subdiagram}{subdiagram}{subdiagrams}
```

### 2.2 Macros and environments

```
\keyfig * [loc] {keys/values} {image filename}
```

A macro to generate a figure with an image from a file.

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

A macro to generate a table with tabular contents. Usually use the `keytable` environment instead.

`\keyflt` \* [*loc*] {*float type*} {*keys/values*} {*contents*}

A macro to generate an arbitrary float type with its contents.

`\keyfigbox` \* [*loc*] {*keys/values*} {*box contents*}

A macro to generate a figure with arbitrary paragraph contents. See example 2.

`\keyparbox` \* [*loc*] {*keys/values*} {*box contents*}

A macro to generate a figure with arbitrary paragraph contents, but no number or caption. This is equal to a `\keyfigbox` with `cstar={}`. Mostly useful to add supplemental information inside a row of floats or subfloats. See example 14.

Env `keyfigure` \* [*loc*] {*keys/values*}

An environment to generate a figure with arbitrary contents. Useful for multi-paragraph contents. See example 3.

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

An environment to generate a table with arbitrary contents. Useful for larger tables. See example 5.

Env `keyfloat` \* [*loc*] {*float type*} {*keys/values*}

An environment to generate an arbitrary float type with its contents. Useful for multi-paragraph contents.

---

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

---

Env `keyfloats` \* [*loc*] {*num columns*}

A group of figures or tables typeset in rows. May be nested. See example 15.

Env `keysubfigs` \* [*loc*] {*numcols*} {*keys*}

A group of subfigures typeset in rows. May not be nested. See example 16.

Env `keysubtabs` \* [*loc*] {*numcols*} {*keys*}

A group of subtables typeset in rows. May not be nested. See example 17.

Env `keysubfloats` \* [*loc*] {*float type*} {*numcols*} {*keys*}

A group of subfloats typeset in rows. May not be nested.

Env `keywrap` {*width of keyfloat*} {*keyfloat*}

Displays a keyfloat next to an environment of text. Usable inside a list item, where [W] will not work.  $\langle keyfloat \rangle$  may be any of `\keyfig`, `keyfigure`, `keyfloats`, `keysubfigs`, etc., each with its proper arguments. See example 27.

Env `marginfigure` [ $\langle offset \rangle$ ]  
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 `marginable` [ $\langle offset \rangle$ ]  
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 `marginable` 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 `wf` key; see the `wrapfig` package documentation for more information. Watch the log for warnings from `wrapfig`.

 **wrapfig warnings**

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

## 2.3 Keys and values

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

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

**keyfloats 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

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

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

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

... continued

**Table 1: Keys and values — part II**

Key <sup>a</sup>	Description	Example
lw	Set the width to a fraction of <code>\linewidth</code> . Cancels <code>w</code> . If a non-image float, sets the width of the text box.	<code>lw=.5</code>
w	Set the actual width. Cancels <code>lw</code> . If a non-image float, sets the width of the text box.	<code>w=2in</code>
h	Set the actual height, images only.	<code>w=2in</code>
s	Set the image scale, images only.	<code>s=3</code>
a	Set the rotation angle; counter-clockwise degrees.	<code>r=90</code>
f	Selects a loose frame with the current <code>\fboxsep</code> . Only rotated with <code>\keyfig</code> .	<code>f</code>
ft	Selects a tight frame with no <code>\fboxsep</code> . Useful for photographs, or diagrams which already have some margin built in.	<code>ft</code>
stretch	Sets <code>\arraystretch</code> inside the float.	<code>stretch=1.5</code>
mo	Sets the vertical offset for a margin float.	<code>mo=-1.2ex</code>
wp	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.	<code>wp=I</code>
va	Sets the vertical alignment of the outermost minipage container for the keyfloat. Defaults to 'c'.	<code>va=t</code>

<sup>a</sup>: None of the keys in Part II are used in the `keysubfigs` and `keysubtabs` environments.

**Table 2: Caption-related key combinations**

Keys in Use			Type of	
c	cstar	sc	Caption <sup>a</sup>	LOF/LOT <sup>b</sup>
•	—	—	Numbered	Caption
•	—	•	Numbered	Short Caption
—	•	—	Unnumbered	None
—	•	•	Unnumbered	Short Caption
—	cstar={}	Ignored	None	None

<sup>a</sup>: Caption: Shows whether the float will be numbered, unnumbered, or have no caption.

<sup>b</sup>: 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: Wrapped float placement options**

Key	Location
r R	to the right of the text body
l L	to the left of the text body
i I	to the inside margin
o O	to the outside margin

The un-capitalized key attempts to place the float “here”, and the capitalized key allows  $\LaTeX$  to try to find the best location. The default is 0.

## 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`.

Len `\KFLTtightframewidth` Combined width of the frame and separation for each of tight and loose frames. These settings should be adjusted when changing the frame width and/or separation. The

Len `\KFLTlooseframewidth` value should be equivalent to `\fboxwidth` plus `\fboxsep`.

Len `\KFLTimageboxwidth` The computed width of the image. Useful to enclose an `mdframed` environment to restrict its width. See example [28](#).



An image.

**Figure 1: A `\keyfig` with an image**

Some text. More text.

Another paragraph.

**Figure 2: A `\keyfigbox`**

## 2.5 Examples

### 2.5.1 Single floats

---

#### Example 1: Figure with an image from a file

*Code:*

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

*Result:*

*Figure 1*

**natural size** 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*

**default width** 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**

A	B
C	D

---

**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**

Arbitrary contents may go here. <sup>a</sup>	
A	B
C	D
<sup>a</sup> 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 \texttt{tc}, \texttt{tl}, or \texttt{tr}
  instead of \texttt{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 `\linewidth`**

---

**Example 7: Using `\linewidth`**

*Code:*

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

*Result:*

*Figure 5*

---

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

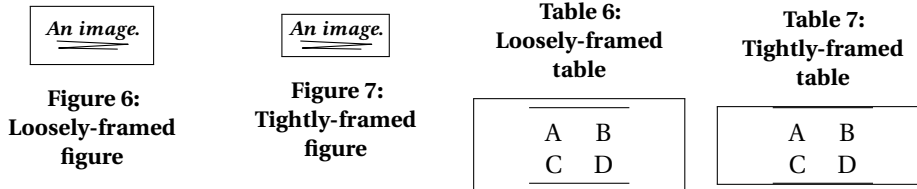
`lw` and `w` are not used at the same time. If both `lw` and `w` are specified, the last one cancels any previous ones.

**Example 8: Using frames***Code:*

```

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

```

*Result:**Figures 6 and 7 and tables 6 and 7*

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.

**Table 8: Table, rotated**

A	B	C
D	E	F

(Framed to show box width.)

**Example 9: Using rotation with boxes***Code:*

```
\keytab{f,w=.8in,c={Table, rotated},
  r=70,l=tab:rotated,
  tc=(Framed to show box width.)}
{\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**
- frame rotation** Unlike an image, the frame of a box does not rotate with its contents.

---

**Example 10: Located [H]ere**

---

Code:

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

Result:

Table 9, Figure 8

**Table 9: A table [H]**

---


A	B
C	D

---

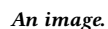


**Figure 8: A keyfig [H]**

---

 **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.**

---

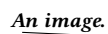
### Example 11: Unnumbered float

Code:

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

Result:


See fig: “A starred caption”.



**A starred caption**

---

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

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

---

### Example 12: Unnumbered float with a LOF entry

Code:

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

Result:

See fig: “Starred caption with a short caption”.

---

A starred caption with a non-empty short caption creates an unnumbered entry in the List of Figures.

---

**Example 13: An unnumbered in-text image**

---

*Code:*

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

*Result:*

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



Optional text which is not a caption.

---

By using [H] and cstar={}, the image is placed inline without a number or LOF entry.

Also see [example 14](#).

Some contents.

A `\keyparbox` with no number or label.

*An image.*

**Figure 9: Next to a `\keyparbox`**

**Example 14: A box without a caption.**

*Code:*

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

*Result:*

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

A `\keyparbox` [H], outside the row.

A `\keyparbox` is a `\keyfigbox` with `cstar={}`, and is mostly useful as an information box inside a row or a set of subfloats.

## 2.5.2 Groups of floats

---

### Example 15: Groups of figures — keyfloats environment

---

Code:

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

Result:

Figure 10 to Table 10

---

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

The keyfloats environment takes an argument for the number of columns. Additional floats are automatically placed on following rows. Changing the number of columns will cause the floats to automatically readjust as necessary. Leftovers will be centered on the last row.

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

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

Keyfloats may be positioned [H]:

```
\begin{keyfloats}[H]{2}...
```

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

```
\begin{keyfloats}*{2}...
```



\raggedright text

**Figure 10: First in a group**

A \keyparbox describing something.

With several paragraphs.

*An image.*

**Figure 11: Third  
in a group**

Another  
image

**Figure 12: Fourth  
in a group**

*An image.*

**Figure 13: Fifth in  
a group**

Another  
image

**Figure 14: Sixth  
in a group**

**Table 10: Seventh in a group**

A	B	C
D	E	F

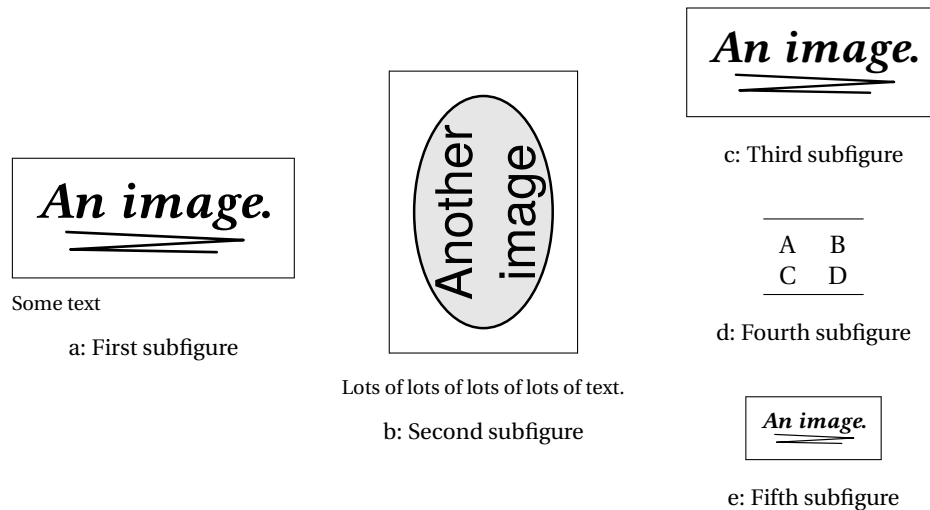


Figure 15: Subfigures

### 2.5.3 Subfloats

---

#### Example 16: Subfigures — keysubfigs environment

Code:

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

Result:

Figure 15

---

Figures 15a to 15e are in the fig. 15 keysubfigs environment. The \keysubtabs environment is similar. Mixed types have the type of their container, as shown with fig. 15d.

Subfloats are associated floats (a, b, ...) collected together into one common float (the enclosing `\keysubfigs` or `\keysubtabs` environment). The enclosing float can have its own caption (call “Sub-Figures” in the example), which appears in the LOF/LOT, and also a label. Each subfloat can have its own caption and label as well, but the subcaption does not appear in the LOF/LOT.

- ⚠ **mixed subfloats** All subfloats are forced to have the same type as its containing float. A table inside a figure will be labeled as a figure, for example. This avoids miss-labeling as each subfloat must clearly be identified as a child of its containing float.
- ⚠ **nested subfloats** `\keysubfigs` and `\keysubtabs` may not be used inside the `keyfloats` environment, and cannot be nested inside each other. (No subfloat 12aa, 12ab, 12ba, etc.)
- nested keyfloats** The `keyfloats` environment may be used inside `\keysubfigs` or `\keysubtabs` to gather subfloats together, such as the three right-most figures in fig. 15.

Subfloats may be located H:

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

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

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

---

#### 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 11: Subtables [H]**

a: First subtable

A	B
C	D

b: Second subtable

A	B	C
D	E	F

---

An image.

**Figure 16: Figure to be continued**

Another  
image

**Figure 16: ...continued**

#### 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*

---





Figure 17: A set of figures



Figure 17: ...continued

### 2.5.5 Continued subfloats

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

---

#### Example 19: Continued subfloats

Code:

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

Result:

*Figure 17*

---

### 2.5.6 Margin floats

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

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

---

#### Example 20: The marginfigure environment

Code:

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

*An image.*

Some text added by hand.

**Figure 18: A marginfigure**

```
Some text added by hand.
\caption{A \env{marginfigure}}
\label{fig:marginfigure}
\end{marginfigure}
```

Result:

*Figure 18*

---



---

#### Example 21: The margintable environment

Code:

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

A	B	C
D	E	F

**Table 12: A margintable**

Result:

*Table 12*

---



Additional text. Text text text text text text.

More paragraphs.

**Figure 19: A `\keyfig[M]`**

### Example 22: Using `\keyfig[M]`

*Code:*

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

More paragraphs.

`{image2}`

*Result:*

*Figure 19*

### Example 23: Using `keytable[M]` and an offset

*Code:*

```
\begin{keytable}[M]{c={A \env{keytable}\texttt{[M]}},
l=tab:keytablem,mo=-.9in}
\centering
\testwidetable
\end{keytable}
```

*Result:*

*Table 13*

**Table 13: A `keytable[M]`**

A	B	C
D	E	F

[margin float offset](#)

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

[distance between floats](#)

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

```
\setlength{\marginparpush}{3ex}
```

### 2.5.7 Wrapped floats

---

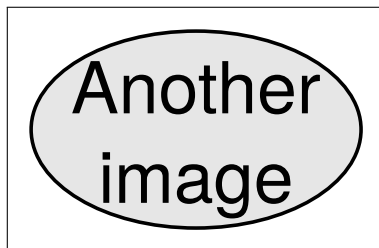
#### Example 24: Using `\keyfig[W]` and `\keytab[W]`

Code:

```
\keyfig[W]{c={A \cs{keyfig}\texttt{[W]}},
  l=fig:keyfigw,ft,lw=.4,wp=I,
  t={.4\cs{linewidth} wide, placed \texttt{I}.}
}{image2}
\lipsum[1]
\keytab[W]{c={A \cs{keytab}\texttt{[W]}},l=tab:keytabw,w=.75in,
}{\testtable}
\lipsum[2]
```

Result:

Figure 20 and table 14



.4\linewidth wide, placed I.

**Figure 20: A `\keyfig[W]`**

bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices

**Table 14: A `\keytab[W]`**

A	B
C	D

**Example 25: Using `\keyfigbox[W]` and `\keyparbox[W]`***Code:*

```

\keyfigbox[W]{c={A \cs{keyfigbox}\texttt{[W]}},
  l=fig:keyfigboxw,f,lw=.25,wp=I,
  t=Text text text text text text text text text
}{The contents.}
\lipsum[1]
\keyparbox[W]{w=1in}{A \cs{keyparbox}[W] and some more text.}
\lipsum[2]

```

*Result:**Figure 21 and the `\keyparbox`.*

The contents.	<p>Text text text text text text text text</p> <p><b>Figure 21: A</b> <code>\keyfigbox[W]</code></p>	<p> Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.</p>
---------------	--	---

<p>Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.</p>	<p>A <code>\keyparbox[W]</code> and some more text.</p>
---	---

**Example 26: Using `\keyfigure[W]` and `\keytable[W]`***Code:*

```

\begin{keyfigure}[W]{c={A \cs{keyfigure}\texttt{[W]}},
  l=fig:keyfigurew,f,w=1.5in}
This is a keyfigure.
\end{keyfigure}
\lipsum[1]

\begin{keytable}[W]{c={A \env{keytable}\texttt{[W]}},
  l=tab:keytablew,w=2in,wp=L,tc=Placed \texttt{[L]} and 2in wide.}
\centering
\testwidetable
\end{keytable}
\lipsum[2]

```

*Result:**Figure 22 and table 15*

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

This is a keyfigure.

**Figure 22: A `\keyfigure[W]`****Table 15: A `\keytable[W]`**

A	B	C
D	E	F

Placed L and 2in wide.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla.

Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

**Example 27: Using keywrap with a \keyfig***Code:*

```

\begin{itemize}
\item First item.
    Several lines of text text text text text
    text text text text text text text.
\item \begin{keywrap}{.3\linewidth}{\keyfig{%
    lw=1,c={Keywrap with \cs{keyfig}},l=fig:keywrapfig%
}}{image}}
    Second item.
    Several lines of text text text text text
    text text text text text text text text
    text text text text text text text.

    These paragraphs are inside the \texttt{keywrap}.
    A vertical gap appears below if the text is not enough to
    fill the space next to the \cs{keyfig}.
\end{keywrap}
    Outside the \env{wrapfig},\marginpar{notes}\
    but still in the second item.
    There is no elegant way to place only part of a paragraph
    inside a \env{keywrap}, and attempting to do so requires
    manually removing the vertical paragraph skip.
\item Third item.
\end{itemize}

```

*Result:**Figure 23*

- First item. Several lines of text text text text text text text text text text text text text.
  - Second item. Several lines of text text text text text text text text text text text text text text text text text.
 

***An image.***

---

**Figure 23: Keywrap with \keyfig**
- 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.
- Outside the wrapfig, but still in the second item. There is no elegant way to place only part of a paragraph inside a keywrap, and attempting to do so requires manually removing the vertical paragraph skip.
- Third item.

notes



Figure 24: Custom-framed image

Figure 25: Custom loosely-framed box

### 2.5.8 Custom frames

---

#### Example 28: Custom frames with mdframed

Code:

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

\renewcommand{\KFLTlooseframe}[1]{%
\begin{mdlooseframe}[leftmargin=1.5in,rightmargin=1.5in]%
#1
\end{mdlooseframe}%
}
\setlength{\KFLTlooseframewidth}{4pt}

\keyfig{ft,c=Custom-framed image,l=fig:customframe,r=90}{image}
\keyfigbox{f,c=Custom loosely-framed box,
l=fig:customlooseframe}{A loosely-framed box.}
```

Result:

Figures 24 and 25

 Pkg mdframed  
mdframed width

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



**Figure 26: Custom shadow**

**Figure 27: Custom loosely-framed shadow**

See section [2.6.1](#) for more details.

---

### Example 29: 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}

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

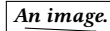
*Result:*

*Figures 26 and 27*

---

Pkg fancybox Example 29 shows custom shadow frames created with the fancybox package. This combination respects lw and w.

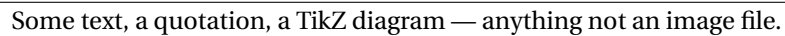
See section [2.6.1](#) for more details.



MR. FIRST LAST III

*About the illustration.*

**Figure 28: Artist's name — image**



MR. LAST

**Figure 29: Artist's name — arbitrary contents**

### 2.5.9 Artist's name

---

#### Example 30: 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 28*

---



---

#### Example 31: 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 29*

---

The artist's name and optional prefix/suffix are printed below the figure, and an index entry is made for the name in (Last, First) format, or (Last) if there is no first name. If the `tocdata` package is loaded, the artist's name is also added to the List of Figures, and the `tocdata \tdname...` macros may be used to align the name.



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 30: Artist's collection**

---

### Example 32: 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 30*

---

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 L<sup>A</sup>T<sub>E</sub>X lengths:

`\KFLTtightframewidth` and `\KFLTlooseframewidth`

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

The default definitions are:

```
\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 28](#) for an example created with the `mdframed` package, and [example 29](#) for an example created with the `fancybox` package.

### 2.6.2 Distance between floats and rows

[rows too close/far](#) 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:

```
% 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 tocddata, if loaded, is new enough:

```

1 \ifpackageloaded{tocdata}{
2   \ifpackageolder{tocdata}{2019/03/21}{}{
3     \PackageError{keyfloat}
4       {%
5         The tocddata package is out of date.\MessageBreak
6         Update to tocddata v2.02 2019/03/21 or later.\MessageBreak
7         to use use this version of keyfloat%
8       }
9     {%
10      Please update the tocddata package. It's worth it!%
11    }
12  }
13 }{}

```

### 3.2 Prohibited packages

Prohibits the use of a certain other packages.

`\KFLT@prohibitpackage`  $\{\langle packagename \rangle\}$

```

14 \newcommand*\KFLT@prohibitpackage}[2]{%
15 \ifpackageloaded{#1}
16 {
17   \PackageError{keyfloat}
18   {%
19     The keyfloat package conflicts with the #1.\MessageBreak
20     package. Remove #1 to use keyfloat.\MessageBreak
21     Alternative(s).\MessageBreak
22     \space\space#2%
23   }
24   {%
25     Keyfloat uses the caption, subcaption, newfloat, and wrapfig packages.%
26   }
27 }{}
28 }

```

`\KFLT@prohibitpackage`  $\{\langle packagename \rangle\}$

Prohibits the use of another package, both now and also `\AtBeginDocument`.

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

The list of prohibited packages:

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

### 3.3 Required packages

Pkg	etoolbox	v2.6 or later for <code>\BeforeBeginEnvironment</code> , <code>\AfterEndEnvironment</code>
		39 <code>\RequirePackage{etoolbox}[2011/01/03]%</code>
Pkg	xparse	Argument processing:
		40 <code>\RequirePackage{xparse}</code>
Pkg	keyval	Key processing:
		41 <code>\RequirePackage{xkeyval}</code>
Pkg	graphicx	For <code>\includegraphics</code> and rotating:
		42 <code>\RequirePackage{graphicx}</code>
Pkg	caption	Handles all caption-related functions:
		43 <code>\RequirePackage{caption}[2010/10/31]% v3.2 to support \phantomcaption</code>
Pkg	subcaption	Derived from <code>caption</code> , used to handle subfloats:
		44 <code>\RequirePackage{subcaption}</code>
Pkg	calc	Used to compute box width minus frame sep and width.
		45 <code>\RequirePackage{calc}</code>

Pkg rotating Provides rotation via the turn environment:

```
46 \RequirePackage{rotating}
```

Pkg placeins Provides

to process existing floats before adding new ones.

```
47 \RequirePackage{placeins}
```

Pkg wrapfig Provides figure wrapping code.

```
48 \RequirePackage{wrapfig}
```

Pkg gettitlestring Used by hyperref and nameref.

Expand names used in titles:

```
49 \PassOptionsToPackage{expand}{gettitlestring}
```

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

### 3.4 In-line figures and tables

These macros are commonly used by others.

Env tablehere Place a table exactly [H].

```
50 \ProvideDocumentEnvironment{tablehere}{}
51 {\bigbreak\noindent\minipage{\linewidth}\def\@capttype{table}}
52 {\endminipage\bigbreak}
```

Env figurehere Place a figure exactly [H].

```
53 \ProvideDocumentEnvironment{figurehere}{}
54 {\bigbreak\noindent\minipage{\linewidth}\def\@capttype{figure}}
55 {\endminipage\bigbreak}
```

### 3.5 Row counting and control

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



---

Ctr	KFLT@numcols	Columns per row.  56 \newcounter{KFLT@numcols}
Ctr	KFLT@thiscol	Column currently processing. 0 if not yet in a keyfloats or subfloat.  57 \newcounter{KFLT@thiscol}
Len	\KFLT@rowboxwidth	How wide is each box in the row.  58 \newlength{\KFLT@rowboxwidth}

### 3.6 Float key handling

Bool	KFLT@cont	Continued float?  59 \newboolean{KFLT@cont}
Key [main]	cont	Continued float?  60 \define@key{KFLT@keys}{cont}[true]{\setboolean{KFLT@cont}{#1}}
	\KFLT@c	Caption storage  61 \newcommand{\KFLT@c}{}
Bool	KFLT@cstar	Starred caption?  62 \newboolean{KFLT@cstar}
Key [main]	c	Caption  63 \define@key{KFLT@keys}{c}{% 64   \renewcommand{\KFLT@c}{#1}\setboolean{KFLT@cstar}{false}% 65 }
Key [main]	cstar	Caption starred?  66 \define@key{KFLT@keys}{cstar}{% 67   \renewcommand{\KFLT@c}{#1}\setboolean{KFLT@cstar}{true}% 68 }

---

Key [main]	sc	Short caption
		<pre>69 \define@key{KFLT@keys}{sc}{% 70   \renewcommand{\KFLT@sc}{#1}% 71   \setboolean{KFLT@scgiven}{true}% 72 }</pre>
	\KFLT@sc	Short caption storage
		<pre>73 \newcommand{\KFLT@sc}{}</pre>
Bool	KFLT@scgiven	Was a short caption given?
		<pre>74 \newboolean{KFLT@scgiven}</pre>
	\KFLT@type	Float type: “figure”, “table”
		<pre>75 \newcommand*{\KFLT@type}{}</pre>
Key [main]	l	Label
		<pre>76 \define@key{KFLT@keys}{l}{\renewcommand{\KFLT@l}{#1}}</pre>
	\KFLT@l	Label storage
		<pre>77 \newcommand*{\KFLT@l}{}  For the artist/author keys:</pre>
Key [main]	ap	Artist prefix
		<pre>78 \define@key{KFLT@keys}{ap}{\renewcommand{\KFLT@ap}{#1}}</pre>
	\KFLT@ap	Storage for artist prefix
		<pre>79 \newcommand*{\KFLT@ap}{}  </pre>
Key [main]	af	Artist first name
		<pre>80 \define@key{KFLT@keys}{af}{\renewcommand{\KFLT@af}{#1}}</pre>
	\KFLT@af	Storage for artist first name
		<pre>81 \newcommand*{\KFLT@af}{}  </pre>

Key [main] al Artist last name

```
82 \define@key{KFLT@keys}{al}{\renewcommand{\KFLT@a1}{#1}}
```

\KFLT@a1 Storage for artist last name

```
83 \newcommand*{\KFLT@a1}{}
```

Key [main] as Artist suffix

```
84 \define@key{KFLT@keys}{as}{\renewcommand{\KFLT@as}{#1}}
```

\KFLT@as Storage for artist suffix

```
85 \newcommand*{\KFLT@as}{}
```

Key [main] aup Author prefix

```
86 \define@key{KFLT@keys}{aup}{\renewcommand{\KFLT@aup}{#1}}
```

\KFLT@aup Storage for author prefix

```
87 \newcommand*{\KFLT@aup}{}
```

Key [main] auf Author first name

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

\KFLT@auf Storage for author first name

```
89 \newcommand*{\KFLT@auf}{}
```

Key [main] au1 Author last name

```
90 \define@key{KFLT@keys}{au1}{\renewcommand{\KFLT@au1}{#1}}
```

\KFLT@au1 Storage for author last name

```
91 \newcommand*{\KFLT@au1}{}
```

Key [main] aus Author suffix

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

`\KFLT@aus` Storage for author suffix

```
93 \newcommand*{\KFLT@aus}{}
```

`\KFLT@textalign` Storage for text alignment.

Used for the additional text in the float.

```
94 \newcommand*{\KFLT@textalign}{}
```

`\KFLT@t` Additional text storage

Used for the additional text in the float.

```
95 \newcommand{\KFLT@t}{}
```

Create replacement macros in case `tocdata` is not loaded:

```
96 \providecommand{\tdartisttextjustify}{}
97 \providecommand{\tdartisttextcenter}{}
98 \providecommand{\tdartisttextleft}{}
99 \providecommand{\tdartisttextright}{}
100 \providecommand{\tdauthortextjustify}{}
101 \providecommand{\tdauthortextcenter}{}
102 \providecommand{\tdauthortextleft}{}
103 \providecommand{\tdauthortextright}{}
104 \providecommand{\tdartistjustify}{}
105 \providecommand{\tdartistcenter}{}
106 \providecommand{\tdartistleft}{}
107 \providecommand{\tdartistright}{}
108 \providecommand{\tdauthorjustify}{}
109 \providecommand{\tdauthorcenter}{}
110 \providecommand{\tdauthorleft}{}
111 \providecommand{\tdauthorright}{}

```

Key [main] t Additional text, justified alignment.

```
112 \define@key{KFLT@keys}{t}{%
113   \renewcommand{\KFLT@t}{#1}%
114   \renewcommand{\KFLT@textalign}{}%
115 }
```

Key [main] tc Additional text, centered alignment.

```
116 \define@key{KFLT@keys}{tc}{%
117   \renewcommand{\KFLT@t}{#1}%
118   \renewcommand{\KFLT@textalign}{\centering}%
119 }
```

Key [main] tr Additional text, aligned to the right.

```
120 \define@key{KFLT@keys}{tr}{%
121   \renewcommand{\KFLT@t}{#1}%
122   \renewcommand{\KFLT@textalign}{\raggedleft}%
123 }
```

Key [main] t1 Additional text, aligned to the left.

```
124 \define@key{KFLT@keys}{t1}{%
125   \renewcommand{\KFLT@t}{#1}%
126   \renewcommand{\KFLT@textalign}{\raggedright}%
127 }
```

Key [main] lw Fraction of \linewidth

```
128 \define@key{KFLT@keys}{lw}{%
129   \renewcommand{\KFLT@lw}{#1}%
130   \setlength{\KFLT@w}{0pt}%
131 }
```

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

```
132 \newcommand*{\KFLT@lw}{}
```

Key [main] w Fixed width

```
133 \define@key{KFLT@keys}{w}{%
134   \setlength{\KFLT@w}{#1}%
135   \renewcommand{\KFLT@lw}{}%
136 }
```

\KFLT@w Width storage: “3cm”

```
137 \newlength{\KFLT@w}
```

Key [main] h Fixed height

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

\KFLT@h Height storage: “2in”

```
139 \newlength{\KFLT@h}
```

Key [main] s Scale

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

\KFLT@s Scale storage: “3”

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

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

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

\KFLT@r Angle storage: “90”

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

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

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

Bool KFLT@f Frame the image?

```
145 \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.

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

Bool KFLT@ft Tightly frame the image?

```
147 \newboolean{KFLT@ft}
```

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

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

\KFLT@stretch Storage for \arraystretch.

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

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

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

`\KFLT@mo` Storage for the vertical margin offset.

```
151 \newlength{\KFLT@mo}
```

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

See table 3 on page 15.

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

`\KFLT@wp` Storage for the wrap placement.

```
153 \newcommand{\KFLT@wp}{0}
```

Key [main] `va` Set vertical alignment of the outermost minipage container.

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

`\KFLT@va` Storage for the vertical alignment.

```
155 \newcommand{\KFLT@va}{c}
```

### 3.7 Nesting control

Ctrl `KFLT@keyfloatdepth` Depth inside a keyfigs environment

```
156 \newcounter{KFLT@keyfloatdepth}
157 \setcounter{KFLT@keyfloatdepth}{0}
```

Bool `KFLT@inkeysubfloats` Inside a keysubfigs environment?

```
158 \newboolean{KFLT@inkeysubfloats}
159 \setboolean{KFLT@inkeysubfloats}{false}
```

### 3.8 Subfloat key handling

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

Bool `KFLT@subgrpcont` Continued float?

```
160 \newboolean{KFLT@subgrpcont}{}
```

Key [subfloat container] cont Continued float

```
161 \define@key{KFLT@subgrpkeys}{cont}[true]{%
162   \setboolean{KFLT@subgrpcont}{#1}%
163 }
```

\KFLT@subgrpc Sub-caption storage

```
164 \newcommand{\KFLT@subgrpc}{}
```

Bool KFLT@subgrpcstart Sub-caption starred?

```
165 \newboolean{KFLT@subgrpcstar}
```

Key [subfloat container] c Caption

```
166 \define@key{KFLT@subgrpkeys}{c}{%
167   \renewcommand{\KFLT@subgrpc}{#1}\setboolean{KFLT@subgrpcstar}{false}%
168 }
```

Key [subfloat container] cstar Starred caption?

```
169 \define@key{KFLT@subgrpkeys}{cstar}{%
170   \renewcommand{\KFLT@subgrpc}{#1}\setboolean{KFLT@subgrpcstar}{true}%
171 }
```

Key [subfloat container] sc Short caption

```
172 \define@key{KFLT@subgrpkeys}{sc}{%
173   \renewcommand{\KFLT@subgrpsc}{#1}%
174   \setboolean{KFLT@subgrpscgiven}{true}%
175 }
```

\KFLT@subgrpsc Sub-shortcaption storage

```
176 \newcommand{\KFLT@subgrpsc}{}
```

Bool KFLT@subgrpscgiven Sub-shortcaption was given?

```
177 \newboolean{KFLT@subgrpscgiven}
```

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

```
178 \newcommand*{\KFLT@subgrprtype}{}
```



Key [subfloat container] 1 Label

```
179 \define@key{KFLT@subgrpkeys}{l}{\renewcommand{\KFLT@subgrpl}{#1}}
180 \newcommand*{\KFLT@subgrpl}{}
```

\KFLT@subgrptextalign Storage for text alignment.

Used for the additional text in the float.

```
181 \newcommand*{\KFLT@subgrptextalign}{}
```

\KFLT@subgrpt Additional text storage

Used for the additional text in the float.

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

Key [subfloat container] t Additional text — full justification

```
183 \define@key{KFLT@subgrpkeys}{t}{%
184   \renewcommand{\KFLT@subgrpt}{#1}%
185   \renewcommand{\KFLT@subgrptextalign}{}%
186 }
```

Key [subfloat container] t Additional text — center justification

```
187 \define@key{KFLT@subgrpkeys}{tc}{%
188   \renewcommand{\KFLT@subgrpt}{#1}%
189   \renewcommand{\KFLT@subgrptextalign}{\centering}%
190 }
```

Key [subfloat container] t Additional text — aligned left

```
191 \define@key{KFLT@subgrpkeys}{tl}{%
192   \renewcommand{\KFLT@subgrpt}{#1}%
193   \renewcommand{\KFLT@subgrptextalign}{\raggedright}%
194 }
```

Key [subfloat container] t Additional text — aligned right

```
195 \define@key{KFLT@subgrpkeys}{tr}{%
196   \renewcommand{\KFLT@subgrpt}{#1}%
197   \renewcommand{\KFLT@subgrptextalign}{\raggedleft}%
198 }
```

For the tocdata package:

---

Key [subfloat container]	ap	<b>Artist prefix</b>
	199	<code>\define@key{KFLT@subgrpkeys}{ap}{\renewcommand{\KFLT@subgrpap}{#1}}</code>
		<code>\KFLT@subgrpap</code> <b>Storage for artist prefix</b>
	200	<code>\newcommand*{\KFLT@subgrpap}{}</code>
Key [subfloat container]	af	<b>Artist first name</b>
	201	<code>\define@key{KFLT@subgrpkeys}{af}{\renewcommand{\KFLT@subgrpaf}{#1}}</code>
		<code>\KFLT@subgrpaf</code> <b>Storage for artist first name</b>
	202	<code>\newcommand*{\KFLT@subgrpaf}{}</code>
Key [subfloat container]	al	<b>Artist last name</b>
	203	<code>\define@key{KFLT@subgrpkeys}{al}{\renewcommand{\KFLT@subgrp1}{#1}}</code>
		<code>\KFLT@subgrp1</code> <b>Storage for artist last name</b>
	204	<code>\newcommand*{\KFLT@subgrp1}{}</code>
Key [subfloat container]	as	<b>Artist suffix</b>
	205	<code>\define@key{KFLT@subgrpkeys}{as}{\renewcommand{\KFLT@subgrpas}{#1}}</code>
		<code>\KFLT@subgrpas</code> <b>Storage for artist suffix</b>
	206	<code>\newcommand*{\KFLT@subgrpas}{}</code>
Key [subfloat container]	aup	<b>Author prefix</b>
	207	<code>\define@key{KFLT@subgrpkeys}{aup}{\renewcommand{\KFLT@subgrpapup}{#1}}</code>
		<code>\KFLT@subgrpapup</code> <b>Storage for author prefix</b>
	208	<code>\newcommand*{\KFLT@subgrpapup}{}</code>
Key [subfloat container]	auf	<b>Author first name</b>
	209	<code>\define@key{KFLT@subgrpkeys}{auf}{\renewcommand{\KFLT@subgrpapuf}{#1}}</code>

`\KFLT@subgrpau1` Storage for author first name

```
210 \newcommand*{\KFLT@subgrpau1}{}
```

Key [subfloat container] `au1` Author last name

```
211 \define@key{KFLT@subgrpkeys}{au1}{\renewcommand{\KFLT@subgrpau1}{#1}}
```

`\KFLT@subgrpau1` Storage for author last name

```
212 \newcommand*{\KFLT@subgrpau1}{}
```

Key [subfloat container] `aus` Author suffix

```
213 \define@key{KFLT@subgrpkeys}{aus}{\renewcommand{\KFLT@subgrpau1}{#1}}
```

`\KFLT@subgrpau1` Storage for author suffix

```
214 \newcommand*{\KFLT@subgrpau1}{}
```

### 3.9 Computing image width

Len `\KFLT@imagewidth` Computed width of the image

```
215 \newlength{\KFLT@imagewidth}
```

Len `\KFLT@boxwidth` Computed width of the container box

```
216 \newlength{\KFLT@boxwidth}
```

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

```
217 \newcommand*{\KFLT@findwidths}{%
```

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

```
218   \ifbool{KFLT@ft}% tight frame?
219     {\setlength{\KFLT@boxwidth}{\linewidth - 2\KFLTtightframewidth}}%
220     {% not tight frame
221       \ifbool{KFLT@f}% loose frame?
222       {\setlength{\KFLT@boxwidth}{\linewidth - 2\KFLTlooseframewidth}}%
223       {\setlength{\KFLT@boxwidth}{\linewidth}}% no frame
224     }% not tight frame
```

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

```
225 \ifdimgreater{\KFLT@w}{0pt}%
```

Width was given:

```
226 {\setlength{\KFLT@imagewidth}{\KFLT@w}}%
227 {% width not given
```

Use full `\linewidth` or only a fraction:

```
228 \ifcempty{\KFLT@lw}%
229 {\setlength{\KFLT@imagewidth}{\KFLT@boxwidth}}%
230 {\setlength{\KFLT@imagewidth}{\KFLT@lw\KFLT@boxwidth}}%
231 }% width not given
232 }
```

### 3.10 Framing and rotation

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

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

```
\KFLTtightframe {<contents>}
```

```
233 \newcommand{\KFLTtightframe}[1]{%
234 \setlength{\fboxsep}{0pt}%
235 \setlength{\fboxrule}{.4pt}%
236 \fbox{#1}%
237 }
238
```

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

```
239 \newlength{\KFLTtightframewidth}
240 \setlength{\KFLTtightframewidth}{.4pt}
```

```
\KFLTlooseframe {<contents>}
```

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

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

```
241 \newcommand{\KFLTlooseframe}[1]{%
242   \setlength{\fboxsep}{3pt}%
243   \setlength{\fboxrule}{.4pt}%
244   \fbox{#1}%
245 }
```

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

```
246 \newlength{\KFLTlooseframewidth}
247 \setlength{\KFLTlooseframewidth}{3.4pt}
```

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

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

```
248 \newcommand{\KFLT@frame}[1]
249 {%
250   \ifbool{KFLT@ft}%
251     {\KFLTtightframe{#1}}%
252     {% not tightframe
253       \ifbool{KFLT@f}%
254         {\KFLTlooseframe{#1}}%
255         {#1}% no frame
256     }% not looseframe
257 }
```

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

```
258 \newcommand{\KFLT@findenvboxwidth}{%
259   \settowidth{\KFLTimageboxwidth}{\usebox{\KFLT@envbox}}%
260   \ifbool{KFLT@ft}%
261     {\addtolength{\KFLTimageboxwidth}{2\KFLTtightframewidth}}%
262     {% not tightframe
263       \ifbool{KFLT@f}%
264         {\addtolength{\KFLTimageboxwidth}{2\KFLTlooseframewidth}}%
265         {}% no frame
266     }% not looseframe
267 }
```

### 3.11 A graphics image from a file

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

Create an image with size, frame, and turn.

```
268 \NewDocumentCommand{\KFLT@onefigureimage}{m}%
269 {%
```

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.

```
270 \begin{lrbox}{\KFLT@envbox}%
```

Handle the lw key. If lw is used, width and height are ignored.

```
271 \ifdefempty{\KFLT@lw}%
272 {% not linewidth
```

Handle the w key, which may be used along with the h key:

```
273 \ifdimgreater{\KFLT@w}{0pt}%
274 {% width is given
275 \ifdimgreater{\KFLT@h}{0pt}%
```

Width and height are both given:

```
276 {% w and h
277 \includegraphics%
278 [scale=\KFLT@s,%
279 width=\KFLT@imagewidth,height=\KFLT@h]{#1}%
280 }% w and h
```

Only width:

```
281 {% only w
282 \includegraphics%
283 [scale=\KFLT@s,width=\KFLT@imagewidth]{#1}%
284 }% only w
285 }% width is given
```

Width was not given, so maybe handle h alone:

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

h was given:

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

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

```

289             {\includegraphics[scale=\KFLT@s]{#1}}%
290         }% width is not given
291     }% not linewidth
292     {% linewidth given
293         \includegraphics[scale=\KFLT@s,width=\KFLT@imagewidth]{#1}%
294     }%
295     \end{lrbox}%
296     \unskip%
297     \KFLT@findenvboxwidth%
298     \begin{turn}{\KFLT@r}%
299     \KFLT@frame{\usebox{\KFLT@envbox}}%
300     \unskip%
301     \end{turn}%
302 }

```

### 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.

```

303 \NewDocumentCommand{\KFLT@dosimplecaption}{m m m}
304 {%
305     \unskip%
306     \IfBooleanTF{#1}% star?
307         {\IfValueTF{#2}{\caption*{#2}{#3}}{\caption*{#3}}}%
308         {\IfValueTF{#2}{\caption[#2]{#3}}{\caption{#3}}}%
309 }

```

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

```

310 \ifpackageloaded{tocdata}
311 {% tocdata loaded

```

`\KFLT@docaption` 1: artist/author  $\langle 2: empty\ or\ "u" \rangle \langle 3: star? \rangle \langle 4: short\ caption \rangle \langle 5: caption \rangle$   
 $\langle 6: empty\ or\ "subgrp" \rangle$

```

312 \newcommand*\KFLT@docaption}[6]{%

```

(`tocdata` does not expand its text argument before checking for empty.)

```

313 \addvspace{\smallskipamount}%

```

```

314 \ifcsemt{KFLT@#6t}{%
315   \IfBooleanTF{#3}%
316   {%
317     \csuse{caption#1}*[#4]{#5}%
318     []%
319     [\csuse{KFLT@#6a#2p}]%
320     {\csuse{KFLT@#6a#2f}}%
321     {\csuse{KFLT@#6a#2l}}%
322     [\csuse{KFLT@#6a#2s}]%
323   }%
324   \csuse{caption#1}[#4]{#5}%
325   []%
326   [\csuse{KFLT@#6a#2p}]%
327   {\csuse{KFLT@#6a#2f}}%
328   {\csuse{KFLT@#6a#2l}}%
329   [\csuse{KFLT@#6a#2s}]%
330 }%
331 }%
332 \ifcsstring{KFLT@#6textalign}{\csuse{td#1textjustify}}{%
333 \ifcsstring{KFLT@#6textalign}{\centering}{\csuse{td#1textcenter}}{%
334 \ifcsstring{KFLT@#6textalign}{\raggedleft}{\csuse{td#1textright}}{%
335 \ifcsstring{KFLT@#6textalign}{\raggedright}{\csuse{td#1textleft}}{%
336 \IfBooleanTF{#3}%
337   {%
338     \csuse{caption#1}*[#4]{#5}%
339     [\csuse{KFLT@#6t}]%
340     [\csuse{KFLT@#6a#2p}]%
341     {\csuse{KFLT@#6a#2f}}%
342     {\csuse{KFLT@#6a#2l}}%
343     [\csuse{KFLT@#6a#2s}]%
344   }%
345   \csuse{caption#1}[#4]{#5}%
346   [\csuse{KFLT@#6t}]%
347   [\csuse{KFLT@#6a#2p}]%
348   {\csuse{KFLT@#6a#2f}}%
349   {\csuse{KFLT@#6a#2l}}%
350   [\csuse{KFLT@#6a#2s}]%
351 }%
352 }%
353 }

```

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

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:

```
354 \NewDocumentCommand{\KFLT@docaption}{s o m m}
355 {%
```

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

```
356   \ifcempty{KFLT@#4al}%
357   {% figure w/o artist
358   \ifcempty{KFLT@#4aul}%
359   {% figure w/o artist or author
```

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

```
360   \KFLT@dosimplecaption{#1}{#2}{#3}%
361   }% figure w/o artist or author
```

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

```
362   {% figure w/ author
363   \KFLT@docaption{author}{u}{#1}{#2}{#3}{#4}%
364   }% figure w/ author
365   }% figure w/o artist
366   {% figure with an artist
```

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

```
367   \KFLT@docaption{artist}{}{#1}{#2}{#3}{#4}%
368   }% figure with an artist
369 }% KFLT@tocdata
370 }% tocdata loaded
371 {% no tocdata
```

Without tocdata:

```
\KFLT@docaption * [⟨2:short caption⟩] {⟨3:caption⟩} {⟨4: empty or “subgrp”⟩}
```

```
372 \NewDocumentCommand{\KFLT@docaption}{s o m m}
373 {%
```

If tocdata is not loaded, use a simple caption.

```
374   \KFLT@dosimplecaption{#1}{#2}{#3}%
```

Create an index entry depending on whether there is a last, first name:

```

375 \ifcempty{KFLT@#4a1}%
376 {%
377   \ifcempty{KFLT@#4a1}%
378   {}%
379   {% yes author
380     \ifcempty{KFLT@#4af}%
381     {\index{\csuse{KFLT@#4a1}}}%
382     {\index{\csuse{KFLT@#4a1}, \csuse{KFLT@#4af}}}%
383   }% yes author
384 }% no artist
385 {% yes artist
386   \ifcempty{KFLT@#4af}%
387   {\index{\csuse{KFLT@#4a1}}}%
388   {\index{\csuse{KFLT@#4a1}, \csuse{KFLT@#4af}}}%
389 }% yes artist
390 }% KFLT@docaption
391 }% no tocdta

```

`\KFLT@caption`  $\{ \langle \textit{empty or "subgrp"} \rangle \}$

Caption-creation logic.

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

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

```

392 \newcommand{\KFLT@caption}[1]{%

```

A starred caption is printed but not numbered.

```

393   \ifbool{KFLT@#1cstar}% starred caption?

```

This is a starred caption:

```

394   {%starred caption

```

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

```

395     \ifcempty{KFLT@#1c}% cstar={}?
396     {}%

```

Non-empty starred caption might have a LOF entry if it has a short caption `sc` key:

```

397     {% non-empty starred caption
398     \ifcempty{KFLT@#1sc}%

```

No sc short caption, but there is a cstar, so no LOF entry:

```
399         {}%
```

Both cstar and sc were given, so add a LOF entry:

```
400         {% non-empty cstar and sc:
401             \edef\KFLT@listtype{\csuse{KFLT@#1type}}%
402             \addcontentsline{\csuse{ext@KFLT@listtype}}%
403                 {\csuse{KFLT@#1type}}{\KFLT@sc}%
404         }% non-empty cstar and sc
```

cstar was given, so create an unnumbered caption:

```
405         \KFLT@docaption*{\csuse{KFLT@#1c}}{#1}%
406     }%
407 }% starred caption
```

Unstarred caption c was given, so number this float:

```
408     {% unstarred caption
409         \ifcsemtyp{KFLT@#1sc}%
410         {% no short cap
411             \KFLT@docaption{\csuse{KFLT@#1c}}{#1}%
412         }% no short cap
413         {% short cap
414             \KFLT@docaption[\csuse{KFLT@#1sc}]%
415             {\csuse{KFLT@#1c}}{#1}%
416         }% short cap
```

Optional label:

```
417         \ifcsemtyp{KFLT@#1l}%
418         {}%
419         {\label{\csuse{KFLT@#1l}}}%
420     }% unstarred caption
421 }
```

### 3.13 Defaults for a new float

`\KFLT@defaults` Defaults all settings before reading the keys.

```
422 \newcommand*{\KFLT@defaults}{%
423     \setboolean{KFLT@cont}{false}%
424     \renewcommand{\KFLT@c}{%
425     \setboolean{KFLT@cstar}{false}%
```

```

426 \renewcommand{\KFLT@sc}{}%
427 \setboolean{KFLT@scgiven}{false}%
428 \renewcommand{\KFLT@type}{figure}%
429 \renewcommand{\KFLT@l}{}%
430 \renewcommand{\KFLT@ap}{}%
431 \renewcommand{\KFLT@af}{}%
432 \renewcommand{\KFLT@a1}{}%
433 \renewcommand{\KFLT@as}{}%
434 \renewcommand{\KFLT@aup}{}%
435 \renewcommand{\KFLT@auf}{}%
436 \renewcommand{\KFLT@a1}{}%
437 \renewcommand{\KFLT@aus}{}%
438 \renewcommand{\KFLT@t}{}%
439 \renewcommand{\KFLT@textalign}{}%
440 \renewcommand{\KFLT@lw}{}%
441 \setlength{\KFLT@w}{0pt}%
442 \setlength{\KFLT@h}{0pt}%
443 \renewcommand{\KFLT@s}{1}%
444 \renewcommand{\KFLT@r}{0}%
445 \setboolean{KFLT@f}{false}%
446 \setboolean{KFLT@ft}{false}%
447 \renewcommand{\KFLT@stretch}{1}%
448 \setlength{\KFLT@mo}{-1.2ex}%
449 \renewcommand{\KFLT@wp}{0}%
450 \renewcommand{\KFLT@va}{c}%
451 }

```

### 3.14 Row start/end processing

`\KFLT@maybestartfloatrow` Counts rows

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

```

452 \newcommand*{\KFLT@maybestartfloatrow}{%
453   \KFLT@maybeendfloatrow%
454   \defcounter{KFLT@thiscol}{\value{KFLT@thiscol}+1}%
455 }

```

`\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.

```

456 \newcommand*{\KFLT@maybeendfloatrow}{%
457   \ifnumless{\value{KFLT@thiscol}}{\value{KFLT@numcols}}%

```

```

458   {}% thiscol < numcols
459   {% >=
460     \par%
461     \advspace{.75\floatsep}%
462     \defcounter{KFLT@thiscol}{0}%
463   }%
464 }%

```

### 3.15 Key environment helper macros

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

```

465 \newcommand{\KFLT@trackrows}%
466 {%

```

If are nested inside a keyfloats or a subfloat:

```

467   \ifboolexpr{%
468     test {\ifnumgreater{\value{KFLT@keyfloatdepth}}{0}} or%
469     bool{KFLT@inkeysubfloats}%
470   }%
471   {% nested

```

Tracks row start and end:

```

472     \KFLT@maybestartfloatrow%

```

Possibly fill space between columns:

```

473     \ifnumgreater{\value{KFLT@thiscol}}{1}%
474     {\hfill}%
475   }%
476 }% nested
477 {}% not nested
478 }

```

`\KFLT@addtext` `{\langle empty or "subgrp" \rangle}`

Adds optional additional text.

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

```

479 \newcommand{\KFLT@addtext}[1]
480 {%

```

Is there text to add?

```
481 \ifcempty{KFLT@#1t}%
482 {}% no text
483 {% text to add
484     {% local
```

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

```
485 \addvspace{\smallskipamount}%
486 \begin{minipage}{\linewidth}%
```

Set the alignment and some text parameters:

```
487 \csuse{KFLT@#1textalign}%
488 \footnotesize%
489 \setlength{\parskip}{1.5ex}%
490 \setlength{\parindent}{0em}%
```

Typeset the actual text:

```
491 \csuse{KFLT@#1t}%
```

Close it all out with a little more space:

```
492 \end{minipage}%
493 \par\addvspace{2ex}%
494     }% local
495 }% text to add
496 }
```

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

Adds optional artist's name and the following space.

```
497 \newcommand{\KFLT@optionalname}[1]
498 {%
499 \ifblank{#1}%
500     {}%
501     {#1~}%
502 }
```

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

Adds optional additional text.

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

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

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

Two versions, depending on whether `tocdata` is loaded:

```
503 \ifpackageloaded{tocdata}
504 {% tocdata loaded
```

If `tocdata` is loaded:

```
505 \newcommand{\KFLT@addartisttext}[1]
506 {%
```

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 `tocdata`.

```
507   \ifcempty{KFLT@#1al}% artist last name
508     {%
509       \ifcempty{KFLT@#1aul}% author last name
510         {\KFLT@addtext{#1}}
511         {}%
512     }%
513   {% fig w/ artist: text will be added by \captionartist in \KFLT@caption
514 }% KFLT@addartisttext
515 }% tocdata loaded
```

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

```
516 {% tocdata not loaded
```

Factored from `\KFLT@addartisttext`

```
517 \newcommand*{\KFLT@addartisttext}[3]{%
```

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

```
518   \addvspace{\medskipamount}%
519   \begin{minipage}{\linewidth}%
```

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

```
520   #3%
```

#1 is empty or 'subgrp'

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

```

521 \footnotesize\textsc{%
522 \KFLT@optionalname{\csuse{KFLT@#1a#2p}}%
523 \KFLT@optionalname{\csuse{KFLT@#1a#2f}}%
524 \csuse{KFLT@#1a#2l}%
525 \csuse{KFLT@#1a#2s}%
526 }%
527 \end{minipage}%
528 \par\addvspace{2ex}%
529 }
530
531 \newcommand{\KFLT@addartisttext}[1]
532 {%

```

Only use the artist information if a last name is given:

```

533 \ifcempty{KFLT@#1al}%
534 {% artist last name not given
535 \ifcempty{KFLT@#1aul}%
536 }% author last name not given
537 {% author last name given
538 \KFLT@addartisttext{#1}{u}{\raggedleft}%
539 }% author last name given
540 }% artist last name not given
541 {% artist last name given
542 \KFLT@addartisttext{#1}{c}{\centering}%
543 }%

```

Any additional text follows the artist's name:

```

544 \KFLT@addtext{#1}%
545 }% KFLT@addartisttext
546 }% tocdata not loaded

```

Len \KFLTimageboxwidth The computed width of the object.

This may be used as the width parameter of a minipage to encase the object.

```

547 \newlength{\KFLTimageboxwidth}

```

Env KFLT@boxinner Typeset the contents in a width which depends on the keys.

```

548 \newsavebox{\KFLT@envbox}
549
550 \NewDocumentEnvironment{KFLT@boxinner}{ }
551 {% keyboxinner

```

(Possibly) frame the contents of an lrbbox:



```
552 \begin{lrbox}{\KFLT@envbox}%
```

Rotate the contents:

```
553 \turn{\KFLT@r}%
```

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

```
554 \minipage{\KFLT@imagewidth}%
```

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

```
555 \setlength{\parskip}{2ex}%
556 \renewcommand{\arraystretch}{\KFLT@stretch}%
557 }% keyboxinner
```

End of the environment:

```
558 {% endkeyboxinner
559 \endminipage%
```

End the rotated box:

```
560 \endturn%
```

Possibly frame:

```
561 \end{lrbox}%
562 \KFLT@frame{\usebox{\KFLT@envbox}}%
563 \par%
564 }% endkeyboxinner
```

\KFLT@boxkeys {*<keys>*} {*<float type>*}

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

```
565 \NewDocumentCommand{\KFLT@boxkeys}{+m m}
566 {%
567 \KFLT@defaults%
568 \renewcommand{\KFLT@type}{#2}%
569 \setkeys{KFLT@keys}{#1}%
570 }
```

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

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

KFLT@LWR@hook@boxouter@minipage Used by `lwarp`.

```
572 \newenvironment*{KFLT@LWR@hook@boxouter@minipage}[2][
573   {\minipage[#1]{#2}}
574   {\endminipage}
```

Env KFLT@boxouter `{\star?}{\loc}`

Boxes the contents of figures and floats.

Not used by subfigures.

```
575 \NewDocumentEnvironment{KFLT@boxouter}{m m}
576 {% 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:

```
577   \ifbool{KFLT@inkeysubfloats}%
578   {\csuse{sub\KFLT@type}{\KFLT@rowboxwidth}}% subfloat
```

If `keyfloats`, place the contents inside a `minipage`:

```
579   {% not subfloat:
580     \ifnumgreater{value{KFLT@keyfloatdepth}}{0}%
581     {% keyfloats
582       \ifbool{KFLT@keywrap}%
583         {\KFLT@LWR@hook@boxouter@minipage[t]{\KFLT@rowboxwidth}}%
584         {\minipage[\KFLT@va]{\KFLT@rowboxwidth}}%
585       \captionsetup*{type=\KFLT@type}%
586     }% keyfloats
587     {% not keyfloats
```

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

```
588   \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.

```
589   \ifbool{KFLT@keywrap}%
590   {%
591     \par\addvspace{\baselineskip}%
592     \noindent%
```

```

593             \KFLT@LWR@hook@boxouter@minipage[t]{\linewidth}%
594             \captionsetup{type=\KFLT@type}%
595             }%
596             {% not a keywrap

```

See if the float should [W]rap:

```

597             \ifstrequal{#2}{W}%

```

Place [W], so create a wrapfloat from the wrapfig package:

```

598             {% [W]

```

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

```

599             \KFLT@findwidths%
600             \wrapfloat{\KFLT@type}{\KFLT@wp}%
601             {\KFLT@imagewidth+2\KFLT@looseframewidth}%

```

Change the interior image to the discovered fixed width.

```

602             \renewcommand{\KFLT@lw}{}%
603             \renewcommand{\KFLT@w}{\KFLT@imagewidth}%
604             }% [W]
605             {% not [W]

```

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

```

606             \ifstrequal{#2}{M}%

```

Place [M], so create a marginfloat:

```

607             {% [M]
608             \KFLT@marginfloat[\KFLT@mo]{\KFLT@type}%
609             \captionsetup{type=\KFLT@type}%
610             }% [M]
611             {% not [M]

```

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

```

612             \ifstrequal{#2}{H}%

```

Place [H], so create an inline minipage:

```

613             {% [H]
614             \par\addvspace{\baselineskip}%

```

```

615             \noindent\minipage[\KFLT@va]{\linewidth}%
616             \captionsetup{type=\KFLT@type}%
617             }% [H]

```

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

```

618             {% not [H]
619             \IfBooleanTF{#1}%
620             {\csuse{\KFLT@type*}[#2]}%
621             {\csuse{\KFLT@type}[#2]}%
622             }% not [H]
623             }% not [M]
624             }% not [W]
625             }% not keywrap
626             }% not keyfloats
627             }% not subfloat

```

Handle a continued float. Ignored if in a subfloat.

```

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

```

Figure out image and parbox widths for the contents:

```

629     \KFLT@findwidths%

```

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

```

630     \caption@iftop{\KFLT@caption{}}{}%

```

Typeset the contents:

```

631     \center\unskip%
632 }% boxouter

```

End of the KFLT@boxouter environment:

```

633 {% endboxouter
634     \endcenter\unskip%
635     \addvspace{\smallskipamount}%

```

Optionally print artist's name and additional text:

```

636     \KFLT@addartisttext{}%

```

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

```

637     \caption@iftop{}{\KFLT@caption{}}%

```

If are inside keysubtabs, end the subtable:

```

638 \ifbool{KFLT@inkeysubfloats}%
639 {%
640   \csuse{endsub\KFLT@type}%
641 }% subfloat
642 {% not subfloat
643   \ifnumgreater{\value{KFLT@keyfloatdepth}}{0}% keyfloats?
644   {%
645     \endminipage%
646   }% keyfloats
647   {% not keyfloats

```

Not subfloat or keyfloats, so is an individual float.

Close the minipage or float:

See if in a keywrap:

```

648 \ifbool{KFLT@keywrap}{%
649   \endKFLT@LWR@hook@boxouter@minipage%
650   \par\advspace{\baselineskip}%
651 }%
652 {% not keywrap

```

See if the float should [W]rap:

```

653 \ifstrequal{#2}{W}%

```

Place [W], so close the wrap float:

```

654 {% [W]
655   \endwrapfloat%
656 }% [W]
657 {% not[W]

```

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

```

658 \ifstrequal{#2}{M}%

```

Place [M], so close the marginfloat:

```

659 {% [M]
660   \endKFLT@marginfloat%
661 }% [M]
662 {% not [M]
663   \ifstrequal{#2}{H}%
664   {%
665     \endminipage% [H]

```

```

666             \par\addvspace{\baselineskip}%
667             }%
668             {% not [H]
669             \IfBooleanTF{#1}% starred float?
670             {\csuse{end\KFLT@type*}}%
671             {\csuse{end\KFLT@type}}%
672             }% not [H]
673             }% not [M]
674             }% not [W]
675             }% not keywrap
676             }% not keyfloats
677             }% not subfloat
678 }% endkeyboxouter

```

`\KFLT@ignorespaces`  $\langle\{commandname\}\rangle$  Only do command if not nested inside something.

```

679 \newcommand*{\KFLT@ignorespaces}[1]{%
680   \ifboolexpr{%
681     test {\ifnumgreater{\value{KFLT@keyfloatdepth}}{0}} or%
682     bool{KFLT@inkeysubfloats}}%
683   }{\csuse{#1}}%
684 }

```

`\KFLT@ignorespaces` Only `\ignorespaces` if not nested inside something.

```

685 \newcommand*{\KFLT@ignorespaces}{%
686   \KFLT@ignorespaces{ignorespaces}%
687 }

```

`\KFLT@envignorespaces` Only `\ignorespaces` if not nested inside something.

```

688 \newcommand*{\KFLT@envignorespaces}{%
689   \KFLT@ignorespaces{ignorespacesafterend}%
690 }

```

### 3.16 The `\KFLT@keyflt` macro

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

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

```

691 \NewDocumentCommand{\KFLT@keyflt}{m m m +m +m}
692 {%
693   \ifcsdef{1@#3}{%

```

```

694     \PackageError{keyfloat}%
695     {%
696     \protect\keyflt: Invalid float type.\MessageBreak%
697     \protect\keyflt*[loc]{type}{keys/values}{contents}\MessageBreak%
698     Also, \protect\keyflt\space is not an environment
699     }%
700     {%
701     Check argument order and float type.
702     }%
703 }%
704 \KFLT@ignorespaces%
705 \KFLT@trackrows%
706 \KFLT@boxkeys{#4}{#3}%
707 \begingroup%
708 \KFLT@boxouter{#1}{#2}%
709 #5%
710 \endKFLT@boxouter%
711 \endgroup%
712 \KFLT@ignorespaces%
713 }

```

### 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.

```

714 \NewDocumentCommand{\keyflt}{s O{tbp} m +m +m}
715 {%
716     \KFLT@keyflt{#1}{#2}{#3}{#4}{%
717     \KFLT@boxinner%
718     \centering%
719     #5%
720     \endKFLT@boxinner%
721     }%
722 }

```

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

```

723 \def\endkeyflt{%
724     \PackageError{keyfloat}
725     {%
726     \protect\end{keyflt}:\MessageBreak
727     \protect\keyflt\space is a macro, not an environment.\MessageBreak
728     Perhaps you want the keyfloat environment instead%

```

```

729   }
730   {%
731       Use \protect\begin{keyfloat} ... \protect\end{keyfloat}.
732   }
733 }

```

### 3.18 The keyfloat environment

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

```

734 \newcommand{\KFLT@keyfloatstart}[4]{%
735     \KFLT@envignorespaces%
736     \KFLT@boxkeys{#4}{#3}%
737     \KFLT@boxouter{#1}{#2}%
738     \KFLT@boxinner%
739 }

```

`\KFLT@keyfloatend`

```

740 \newcommand{\KFLT@keyfloatend}{%
741     \endKFLT@boxinner%
742     \endKFLT@boxouter%
743     \KFLT@envignorespaces%
744 }

```

Env `keyfloat` \*  $[\langle\mathit{loc}\rangle]\langle\mathit{float\ type}\rangle\langle\mathit{keys/values}\rangle$

```

745 \NewDocumentEnvironment{keyfloat}{s O{tbp} m +m}
746 {%
747     \KFLT@keyfloatstart{#1}{#2}{#3}{#4}%
748 }%
749 {%
750     \KFLT@keyfloatend%
751 }

```

Before `keyfloat`

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

```

752 \BeforeBeginEnvironment{keyfloat}{%
753     \KFLT@trackrows%
754 }

```



### 3.19 The keyfigure environment

```
Env keyfigure * [loc] {keys/values}
```

```
755 \NewDocumentEnvironment{keyfigure}{s O{tbp} +m}
756 {%
757   \KFLT@keyfloatstart{#1}{#2}{figure}{#3}%
758 }%
759 {%
760   \KFLT@keyfloatend%
761 }
```

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.

```
762 \BeforeBeginEnvironment{keyfigure}{%
763   \KFLT@trackrows%
764 }
```

### 3.20 The \keyfig macro

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

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

```
765 \NewDocumentCommand{\keyfig}{s O{tbp} +m m}
766 {%
767   \KFLT@keyflt{#1}{#2}{figure}{#3}{%
768     \KFLT@onefigureimage{#4}%
769   }%
770 }
```

### 3.21 The \keyfigbox macro

```
\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 keyfloats or keysubtabs environment.

```
771 \NewDocumentCommand{\keyfigbox}{s O{tbp} +m +m}
772 {%
```

```

773 \KFLT@ignorespaces%
774 \KFLT@trackrows%
775 \KFLT@boxkeys{#3}{figure}%
776 \begingroup%
777 \KFLT@boxouter{#1}{#2}%
778 \KFLT@boxinner%
779 #4%
780 \endKFLT@boxinner%
781 \endKFLT@boxouter%
782 \endgroup%
783 \KFLT@ignorespaces%
784 }

```

### 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.

```

785 \NewDocumentCommand{\keyparbox}{s O{tbp} +m +m}
786 {%
787 \KFLT@ignorespaces%
788 \KFLT@trackrows%
789 \KFLT@boxkeys{#3}{figure}%

```

Force `cstar={}`:

```

790 \renewcommand{\KFLT@c}{}%
791 \setboolean{KFLT@cstar}{true}%

```

Continue like `\figbox`:

```

792 \begingroup%
793 \KFLT@boxouter{#1}{#2}%
794 \KFLT@boxinner%
795 #4%
796 \endKFLT@boxinner%
797 \endKFLT@boxouter%
798 \endgroup%
799 \KFLT@ignorespaces%
800 }

```

### 3.23 The `\keytab` macro

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

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

```
801 \NewDocumentCommand{\keytab}{s O{tbp} +m +m}
802 {%
803   \IfBooleanTF{#1}{%
804     \keyflt*[#2]{table}{#3}{#4}%
805   }{%
806     \keyflt[#2]{table}{#3}{#4}%
807   }%
808 }
```

### 3.24 The `keytable` environment

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

```
809 \NewDocumentEnvironment{keytable}{s O{tbp} +m}
810 {%
811   \KFLT@keyfloatstart{#1}{#2}{table}{#3}%
812 }%
813 {%
814   \KFLT@keyfloatend%
815 }
```

Before `keytable`

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

```
816 \BeforeBeginEnvironment{keytable}{%
817   \KFLT@trackrows%
818 }
```

### 3.25 A row of floats

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

```
819 \newcommand*\KFLT@nonest{%
820   \ifboolean{#1}{%
821     test {\ifnumgreater{\value{KFLT@keyfloatdepth}}{0}} or
822     bool {KFLT@inkeysubfloats}%
823   }%
824 }
```

```

823 }%
824 {%
825   \PackageError{keyfloat}%
826   {%
827     Cannot nest keysubfigs or keysubtabs.\MessageBreak%
828     (Not in outer par mode.)%
829   }%
830   {%
831     The subcaption package do not support nested environments,\MessageBreak
832     so the keyfloat package cannot place a\MessageBreak
833     keysubfigs or keysubtabs environment inside another,\MessageBreak
834     or inside a keyfloats.%
835   }%
836 }%
837 {}%
838 }

```

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

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

`KFLT@LWR@hook@keyfloatsminipage` Modified by `lwarp`.

```

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

```

Env `keyfloats` \* [*loc*] {*num columns*}

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

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

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

```

843 \NewDocumentEnvironment{keyfloats}{s O{tbp} m}
844 {%
845   \KFLT@envignorespaces%

```

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

```
846 \KFLT@LWR@hook@keyfloats%
```

Track the depth:

```
847 \addtocounter{KFLT@keyfloatdepth}{1}%
```

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

```
848 \ifboolexpr{%
849     test {\ifstrequal{#2}{H}} or
850     test {\ifnumgreater{\value{KFLT@keyfloatdepth}}{1}} or
851     bool {KFLT@inkeysubfloats} or
852     bool {KFLT@keywrap}%
853 }%
```

Create an inline minipage:

```
854 {% [H] or nested
```

If nested, use different spacing as was computed in the outer nesting level:

```
855 \ifboolexpr{%
856     test {\ifnumgreater{\value{KFLT@keyfloatdepth}}{1}} or
857     bool {KFLT@inkeysubfloats}
858 }%
859 {%
860     \KFLT@LWR@hook@keyfloatsminipage{\KFLT@rowboxwidth}%
861 }%
862 {%
863     \bigbreak%
864     \KFLT@LWR@hook@keyfloatsminipage{\linewidth}%
865 }%
```

If inside subfloats, generate subfigures by default:

```
866 \ifbool{KFLT@inkeysubfloats}%
867 {}%
868 {\captionsetup*{type=figure}}%
869 }% [H] or nested
```

Isn't [H] or nested, so create a figure:

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

Compute the width of each entry:

```
875 \ifboolexpr{%
876     test {\ifnumgreater{\value{KFLT@keyfloatdepth}}{1}} or
877     bool {KFLT@inkeysubfloats}
878 }%
```

Nested or subfloats:

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

Keyfloats:

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

Center the contents:

```
881 \centering%
```

Count columns using `\defcounter` for a local effect:

```
882 \defcounter{KFLT@numcols}{#3}%
883 \defcounter{KFLT@thiscol}{0}%
884}% starting keyfloats environment
```

When ending a keyfloats environment:

```
885}% ending keyfloats environment
```

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

```
886 \ifboolexpr{%
887     test {\ifstrequal{#2}{H}} or
888     test {\ifnumgreater{\value{KFLT@keyfloatdepth}}{1}} or
889     bool {KFLT@inkeysubfloats} or
890     bool {KFLT@keywrap}
891 }%
892 {% was [H], etc.
893 \endKFLT@LWR@hook@keyfloatsminipage%
894 % \end{minipage}%
```

Spacing if nested:

```
895 \ifboolexpr{
896     test {\ifnumgreater{\value{KFLT@keyfloatdepth}}{0}} or
897     bool {KFLT@keywrap}
898 }%
899 {}%
```

```

900         \bigbreak%
901     }%
902 }% was [H], etc.

```

Was not [H], so close a figure:

```

903     {% not [H], etc.
904         \IfBooleanTF{#1}% starred figure?
905         {\end{figure*}}{\end{figure}}%
906     }% not [H], etc.

```

Unnest the environment:

```

907     \addtocounter{KFLT@keyfloatdepth}{-1}%
908     \KFLT@envignorespaces%
909 }

```

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.

```

910 \BeforeBeginEnvironment{keyfloats}{%
911     \KFLT@trackrows%
912 }

```

### 3.26 Subfloats

`\KFLT@subgrpdefaults` Sets defaults before reading the keys.

```

913 \newcommand*{\KFLT@subgrpdefaults}{%
914     \setboolean{KFLT@subgrpcont}{false}%
915     \renewcommand{\KFLT@subgrpcc}{}%
916     \setboolean{KFLT@subgrpccstar}{false}%
917     \renewcommand{\KFLT@subgrpcc}{}%
918     \setboolean{KFLT@subgrpccgiven}{false}%
919     \renewcommand{\KFLT@subgrptype}{figure}%
920     \renewcommand{\KFLT@subgrppl}{}%
921     \renewcommand{\KFLT@subgrpap}{}%
922     \renewcommand{\KFLT@subgrpaf}{}%
923     \renewcommand{\KFLT@subgrpap1}{}%
924     \renewcommand{\KFLT@subgrpas}{}%
925     \renewcommand{\KFLT@subgrpapup}{}%
926     \renewcommand{\KFLT@subgrpapuf}{}%
927     \renewcommand{\KFLT@subgrpap1}{}%
928     \renewcommand{\KFLT@subgrpapaus}{}%
929     \renewcommand{\KFLT@subgrpapt}{}%
930     \renewcommand{\KFLT@subgrpptextalign}{}%

```

931 }

\KFLT@subfloats {<starred?>} {<loc>} {<cols>} {<keys/values>}

Start a subfloat environment

```
932 \NewDocumentCommand{\KFLT@subfloats}{m m m +m}
933 {%
934   \KFLT@envignorespaces%
```

Parse the key-value combinations:

```
935   \setkeys{KFLT@subgrpkeys}{#4}%
```

Nest the environment:

```
936   \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.

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

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

```
940   \ifboolexpr{%
941     test {\ifstrequal{#2}{H}} or
942     bool {KFLT@keywrap}
943   }%
944   {%
945     \bigbreak\noindent\begin{minipage}{\linewidth}%
946   }%
```

Isn't [H], so create a float, possibly starred:

```
947   {%
948     \IfBooleanTF{#1}%
949     {\begin{KFLT@subgrptype*}[#2]}%
950     {\begin{KFLT@subgrptype}[#2]}%
951   }%
```

Set the caption type:

```
952   \captionsetup*{type=\KFLT@subgrptype}%
```



Process continued floats:

```
953 \ifbool{KFLT@subgrpcont}%
954   {\ContinuedFloat}%
955   {}}%
```

Center the contents:

```
956 \center\unskip%
```

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

```
957 \caption@iftop{KFLT@caption{subgrp}}{}}%
```

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

```
958 \defcounter{KFLT@numcols}{#3}%
959 \defcounter{KFLT@thiscol}{0}%
```

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

```
960 \begingroup%
961 }
```

```
\KFLT@endsubfloats {<starred?>} {<loc>}
```

Ends a subfloat environment.

```
962 \newcommand*{\KFLT@endsubfloats}[2]{%
```

End the group containing the subfloats:

```
963 \endgroup%
964 \unskip%
965 \endcenter%
```

A little extra space at the bottom:

```
966 \par\addvspace{\bigskipamount}%
```

Optionally print artist's name and additional text:

```
967 \KFLT@addartisttext{subgrp}%
```

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

```
968 \caption@iftop{}{\KFLT@caption{subgrp}}%
```

End the float or minipage:

```

969 \ifboolexpr{%
970     test {\ifstrequal{#2}{H}} or
971     bool{KFLT@keywrap}
972 }%
973 {\end{minipage}\bigbreak}% was [H]
974 {% not [H]:
975     \IfBooleanTF{#1}% starred?
976         {\end{KFLT@subgrptype*}}%
977         {\end{KFLT@subgrptype}}%
978 }% not [H]

```

Unnest the environment:

```

979 \setboolean{KFLT@inkeysubfloats}{false}%
980 \KFLT@envignorespaces%
981 }

```

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

```

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

```

Env KFLT@keysubfloats `{\langle star? \rangle}{\langle loc \rangle}{\langle float type \rangle}{\langle numcols \rangle}{\langle keys/values \rangle}`

A group of subfigures typeset in rows.

```

983 \NewDocumentEnvironment{KFLT@keysubfloats}{m m m m +m}
984 {%

```

Error if trying to nest environments:

```

985 \KFLT@nonest%

```

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

```

986 \KFLT@LWR@hook@keysubfloats%

```

Default the options:

```

987 \KFLT@subgrpdefaults%

```

Default to figure float type:

```

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

```

Start of the environment:

```
989 \KFLT@subfloats{#1}{#2}{#4}{#5}%
990 }% the start of the environment
```

end of the environment:

```
991 {%
992 \KFLT@endsubfloats{#1}{#2}%
993 }
```

Env keysubfloats \* [*loc*] {*float type*} {*numcols*} {*keys/values*}

A group of subfloats typeset in rows.

```
994 \NewDocumentEnvironment{keysubfloats}{s O{tbp} m m +m}
995 {%
996 \KFLT@keysubfloats{#1}{#2}{#3}{#4}{#5}%
997 }{%
998 \endKFLT@keysubfloats%
999 }
```

Env keysubfigs \* [*loc*] {*numcols*} {*keys/values*}

A group of subfigures typeset in rows.

```
1000 \NewDocumentEnvironment{keysubfigs}{s O{tbp} m +m}
1001 {%
1002 \KFLT@keysubfloats{#1}{#2}{figure}{#3}{#4}%
1003 }{%
1004 \endKFLT@keysubfloats%
1005 }
```

Env keysubtabs \* [*loc*] {*numcols*} {*keys/values*}

A group of subtables typeset in rows.

```
1006 \NewDocumentEnvironment{keysubtabs}{s O{tbp} m +m}
1007 {%
1008 \KFLT@keysubfloats{#1}{#2}{table}{#3}{#4}%
1009 }{%
1010 \endKFLT@keysubfloats%
1011 }
```

### 3.27 Margin floats

```

Env KFLT@marginfloat [<offset>] {<type>}

1012 \newsavebox{\KFLT@marginfloatbox}
1013
1014 \NewDocumentEnvironment{KFLT@marginfloat}{0{-1.2ex} m}
1015 {% start
1016   \FloatBarrier% keep floats in order
1017   \KFLT@envignorespaces%
1018   \begin{lrbox}{\KFLT@marginfloatbox}%
1019   \begin{minipage}{\marginparwidth}%
1020   \captionsetup{type=#2}%
1021   \hbox{} \vspace*{#1}%
1022   \noindent%
1023 }% start
1024 {% end
1025   \end{minipage}%
1026   \end{lrbox}%
1027   \marginpar{\usebox{\KFLT@marginfloatbox}}%
1028   \KFLT@envignorespaces%
1029 }% end

```

Provided in case `tufte-book` is not loaded:

```

Env marginfigure [<offset>]

1030 \ProvideDocumentEnvironment{marginfigure}{0{-1.2ex}}
1031 {\begin{KFLT@marginfloat}[#1]{figure}}
1032 {\end{KFLT@marginfloat}}

```

```

Env margintable [<offset>]

1033 \ProvideDocumentEnvironment{margintable}{0{-1.2ex}}
1034 {\begin{KFLT@marginfloat}[#1]{table}}
1035 {\end{KFLT@marginfloat}}

```

### 3.28 Wrapped floats

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

```

1036 \newboolean{KFLT@keywrap}
1037 \boolfalse{KFLT@keywrap}

```

```

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

1038 \newlength{\KFLT@keywrapwidth}

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

1039 \newlength{\KFLT@keywrapparskip}

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

1040 \newlength{\KFLT@keywrapparindent}

Env keywrap {<width>} {<keyfloat>}

1041 \DeclareDocumentEnvironment{keywrap}{m +m}
1042 {%
1043   \par%
1044   \setlength{\KFLT@keywrapwidth}{\linewidth}%
1045   \addtolength{\KFLT@keywrapwidth}{-#1}%
1046   \addtolength{\KFLT@keywrapwidth}{-2em}%
1047   \minipage[t]{\KFLT@keywrapwidth}%
1048   %
1049   \setlength{\parskip}{\KFLT@keywrapparskip}%
1050   \setlength{\parindent}{\KFLT@keywrapparindent}%
1051   \booltrue{KFLT@keywrap}%
1052 }
1053 {%
1054   \par%
1055   \endminipage%
1056   \hfill%
1057   \begin{minipage}[t]{#1}%
1058     \booltrue{KFLT@keywrap}%
1059     #2%
1060     \par%
1061     \unskip\vspace{\smallskipamount}%
1062     \end{minipage}%
1063     \par%
1064 }
1065
1066 \BeforeBeginEnvironment{keywrap}{%
1067   \setlength{\KFLT@keywrapparskip}{\parskip}%
1068   \setlength{\KFLT@keywrapparindent}{\parindent}%
1069 }

```

# Change History and Index

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General: 2016/12/02 . . . . .	1	General: 2019/01/11 . . . . .	1
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\keyflt: Group around contents. . . . .	79	Removed xifthen dependency. . . . .	47
\keyparbox: Group around contents. . . . .	82	Removed spurious spaces. . . . .	1
General: 2016/12/09 . . . . .	1	Source formatting improvements. . . . .	1
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Docs: Wrapped float examples. . . . .	36	authors. . . . .	65
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