The \texttt{kvoptions} package

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Abstract

This package is intended for package authors who want to use options in key value format for their package options.

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\textsuperscript{*}Please report any issues at https://github.com/ho-tex/oberdiek/issues
1 Introduction

First I want to recommend the very good review article “A guide to key-value methods” by Joseph Wright [1]. It introduces the different key-value packages and compares them.

1.1 The beginning

This package kvoptions addresses class or package writers that want to allow their users to specify options as key value pairs, e.g.:

\documentclass[verbose=false,name=me]{myclass}
\usepackage[format=print]{mylayout}

Prominent example is package hyperref, probably the first package that offers this service. It’s \ProcessOptionsWithKV is often copied und used in other packages, e.g. package helvet that uses this interface for its option scaled.

However copying code is not the most modern software development technique. And hyperref’s code for \ProcessOptionsWithKV was changed to fix bugs. The version used in other packages depends on the time of copying and the awareness of hyperref’s changes. Now the code is sourced out into this package and available for other package or class writers.

1.2 Overview

Package kvoptions connects package keyval with \LaTeX’s package and class options:

\begin{verbatim}
\begin{tabular}{|c|c|c|}
\hline
Package keyval & Package kvoptions & \LaTeX kernel \\
\hline
\protect\define@key & \protect\DeclareVoidOption & \protect\DeclareOption \\
& \protect\DeclareStringOption & \\
& \protect\DeclareBoolOption & \\
& \protect\DeclareComplementaryOption & \\
& \protect\DisableKeyvalOption & \\
\hline
& \protect\DeclareDefaultOption & \protect\DeclareOption* \\
\hline
\protect\ProcessKeyvalOptions & \protect\ProcessOptions* & \\
\hline
Option patch & Class/package option system & \\
\hline
\protect\SetupKeyvalOptions & & \\
\end{tabular}
\end{verbatim}

2 Usage

2.1 Process options

2.1.1 \ProcessKeyvalOptions

This command evaluates the global or local options of the package that are defined
with keyval's interface within the family \textit{(family)}. It acts the same way as \LaTeX's \texttt{\ProcessOptions*}. In a package unknown global options are ignored, in a class they are added to the unknown option list. The known global options and all local options are passed to keyval's \texttt{\setkeys} command for executing the options. Unknown options are reported to the user by an error.

If the family name happens to be the same as the name of the package or class where \texttt{\ProcessKeyvalOptions} is used or the family name has previously been setup by \texttt{\SetupKeyvalOptions}, then \texttt{\ProcessKeyvalOptions} knows the family name already and you can use the star form without mandatory argument.

2.1.2 \texttt{\ProcessLocalKeyvalOptions}

\begin{verbatim}
\ProcessLocalKeyvalOptions{⟨family⟩}
\ProcessLocalKeyvalOptions*
\end{verbatim}

This macro has the same syntax and works similar as \texttt{\ProcessKeyvalOptions}. However it ignores global options and only processes the local package options. Therefore it only can be used inside a package. An error is thrown, if it is used inside a class.

Neither of the following macros are necessary for \texttt{\ProcessKeyvalOptions}. They just help the package/class author in common tasks.

2.1.3 \texttt{\SetupKeyvalOptions}

\begin{verbatim}
\SetupKeyvalOptions{
  family = ⟨family⟩,
  prefix = ⟨prefix⟩,
  setkeys = ⟨setkeys command⟩
}
\end{verbatim}

This command allows to configure the default assumptions that are based on the current package or class name. \LaTeX remembers this name in \texttt{@currname}. The syntax description of the default looks a little weird, therefore an example is given for a package or class named \texttt{foobar}.

<table>
<thead>
<tr>
<th>Key</th>
<th>Default</th>
<th>(example)</th>
<th>Used by</th>
</tr>
</thead>
<tbody>
<tr>
<td>family</td>
<td>⟨\texttt{@currname}⟩</td>
<td>(foobar)</td>
<td>\texttt{\ProcessKeyvalOptions*} \texttt{\DeclareBoolOption} \texttt{\DeclareStringOption}</td>
</tr>
<tr>
<td>prefix</td>
<td>⟨\texttt{@currname}@⟩</td>
<td>(foobar@)</td>
<td>\texttt{\DeclareBoolOption} \texttt{\DeclareStringOption} \texttt{\DeclareVoidOption}</td>
</tr>
<tr>
<td>setkeys</td>
<td>setkeys</td>
<td>⟨kvsetkeys⟩</td>
<td>\texttt{\ProcessKeyvalOptions} \texttt{\ProcessLocalKeyvalOptions}</td>
</tr>
</tbody>
</table>

Key \texttt{setkeys} was added in version 3.9. The original \texttt{\setkeys} of package keyval is not reentrant. If an option is processed by this \texttt{\setkeys}, then the option should not call \texttt{\setkeys} again with a different family. Otherwise the next options of the first \texttt{\setkeys} call are processed with the wrong family. With key \texttt{setkeys} the macro \texttt{\kvsetkeys} can be set that does not have the problem of the original \texttt{\setkeys} of package keyval.

Probably \texttt{\setkeys} of package \texttt{xkeyval} is safe in this respect. But I haven’t made a full analysis. At least it does not have the problem of the original \texttt{\setkeys}. 

4
2.2 Option declarations

The options for \ProcessKeyvalOptions are defined by keyval’s \define@key. Common purposes of such keys are boolean switches, they enable or disable something. Or they store a name or some kind of string in a macro. The following commands help the user. He declares what he wants and kvoptions take care of the key definition, resource allocation and initialization.

In order to avoid name clashes of macro names, internal commands are prefixed. Both the prefix and the family name for the defined keys can be configured by \SetupKeyvalOptions.

2.2.1 \DeclareStringOption

\DeclareStringOption[⟨init⟩] {⟨key⟩} [⟨default⟩]

A macro is created that remembers the value of the key ⟨key⟩. The name of the macro consists of the option name ⟨key⟩ that is prefixed by the prefix (see 2.1.3). The initial contents of the macro can be given by the first optional argument ⟨init⟩. The default is empty.

The option ⟨key⟩ is defined. The option code just stores its value in the macro. If the optional argument at the end of \DeclareStringOption is given, then option ⟨key⟩ is defined with the default ⟨default⟩.

Example for a package with the following two lines:

\ProvidesPackage{foobar}
\DeclareStringOption{me}{name}

Then \DeclareStringOption defines the macro with content me, note \LaTeXX complains if the name of the macro already exists:

newcommand*{\foobarnamemel}{me}

The option definition is similar to:

\define@key{foobar}{name}{%
  \renewcommand*{\foobarnamel}{#1}%
  %}

2.2.2 \DeclareBoolOption

\DeclareBoolOption[⟨init⟩] {⟨key⟩}

A boolean switch is generated, initialized by value ⟨init⟩ and the corresponding key ⟨key⟩ is defined. If the initialization value is not given, false is used as default.

The internal actions of \DeclareBoolOption are shown below. The example is given for a package author who has the following two lines in his package/class:

\ProvidesPackage{foobar}
\DeclareBoolOption{verbose}

First a new switch is created:

newif\iffoobar@verbose

and initialized:

\foobar@verbosefalse

Finally the key is defined:

\define@key{foobar}{verbose}{true}{...}
The option code configures the boolean option in the following way: If the author specifies `true` or `false` then the switch is turned on or off respectively. Also the option can be given without explicit value. Then the switch is enabled. Other values are reported as errors.

Now the switch is ready to use in the package/class, e.g.:

```latex
\iffoobar@verbose
  % print verbose message
\else
  % be quiet
\fi
```

Users of package \ifthen can use the switch as boolean:

```latex
boolean{foobar@verbose}
```

### 2.2.3 \DeclareComplementaryOption

\DeclareComplementaryOption{⟨key⟩}{⟨parent⟩}

Sometimes contrasting names are used to characterize the two states of a boolean switch, for example `draft` vs. `final`. Both options behave like boolean options but they do not need two different switches, they should share one. \DeclareComplementaryOption allows this. The option `⟨key⟩` shares the switch of option `⟨parent⟩`. Example:

```latex
\DeclareBoolOption{draft}
\DeclareComplementaryOption{final}{draft}
```

Then `final` sets the switch of `draft` to `false`, and `final=false` enables the `draft` switch.

### 2.2.4 \DeclareVoidOption

\DeclareVoidOption{⟨key⟩}{⟨code⟩}

\ProcessKeyvalOptions can be extended to recognize options that are declared in traditional way by \DeclareOption. But in case of the error that the user specifies a value, then this option would not recognized as key value option because of \DeclareOption and not detected as traditional option because of the value part. The user would get an unknown option error, difficult to understand.

\DeclareVoidOption solves this problem. It defines the option `⟨key⟩` as key value option. If the user specifies a value, a warning is given and the value is ignored.

The code part `⟨code⟩` is stored in a macro. The name of the macro consists of the option name `⟨key⟩` that is prefixed by the prefix (see 2.1.3). If the option is set, the macro will be executed. During the execution \CurrentOption is available with the current key name.

### 2.2.5 \DeclareDefaultOption

\DeclareDefaultOption{⟨code⟩}

This command does not define a specific key, it is the equivalent to \LaTeX’s \DeclareOption*. It allows the specification of a default action `⟨code⟩` that is invoked if an unknown option is found. While `⟨code⟩` is called, macro \CurrentOption contains the current option string. In addition \CurrentOptionValue contains the value part if the option string is parsable as key value pair, otherwise
it is \relax. \CurrentOptionKey contains the key of the key value pair, or the whole option string, if it misses the equal sign.

Inside packages typical default actions are to pass unknown options to another package. Or an error message can be thrown by \@unknownoptionerror. This is the original error message that \LaTeX{} gives for unknown package options. This error message is easier to understand for the user as the error message from package keyval that is given otherwise.

A Class ignores unknown options and puts them on the unused option list. Let \LaTeX{} do the job and just call \OptionNotUsed. Or the options can be passed to another class that is later loaded.

### 2.2.6 Local options

\begin{code}
\begin{align*}
&\DeclareLocalOption \{ ⟨option⟩ \} \\
&\DeclareLocalOptions \{ ⟨option list⟩ \}
\end{align*}
\end{code}

Both macros mark package options as local options. That means that they are ignored by \ProcessKeyvalOptions if they are given as global options. \DeclareLocalOptions takes one option, \DeclareLocalOptions expects a comma separated list of options.

### 2.2.7 Dynamic options

Options of \LaTeX{}’s package/class system are cleared in \ProcessOptions. They modify the static model of a package. For example, depending on option bookmarks package hyperref loads differently.

Options, however, defined by keyval’s \define@key remain defined, if the options are processed by \setkeys. Therefore these options can also be used to model the dynamic behaviour of a package. For example, in hyperref the link colors can be changed everywhere until the end in \end{document}.

However package color that adds color support is necessary and it cannot be loaded after \begin{document}. Option colorlinks that loads color should be active until \begin{document} and die in some way if it is too late for loading packages. With \DisableKeyvalOption the package/class author can specify and configure the death of an option and controls the life period of the option.

### 2.2.8 \DisableKeyvalOption

\begin{code}
\begin{align*}
&\DisableKeyvalOption \{ ⟨options⟩ \} \{ ⟨family⟩ \} \{ ⟨key⟩ \} \\
&⟨options⟩: \\
&\text{action} = \text{undef}, \text{warning}, \text{error}, \text{or ignore} \quad \text{default: undef} \\
&\text{global or local} \quad \text{default: global} \\
&\text{package or class} = ⟨name⟩
\end{align*}
\end{code}

\DisableKeyvalOption can be called to mark the end when the option ⟨key⟩ is no longer useful. The behaviour of an option after its death can be configured by action:

- **undef**: The option will be undefined, If it is called, \setkeys reports an error because of unknown key.

- **error or warning**: Use of the option will cause an error or warning message. Also these actions require that exclusively either the package or class name is given in options package or class.

- **ignore**: The use of the option will silently be ignored.
The option’s death can be limited to the end of the current group, if option local
is given. Default is global.

The package/class author can wish the end of the option already during the
package loading, then he will have static behaviour. In case of dynamic options
\DisableKeyvalOption can be executed everywhere, also outside the package.
Therefore the family name and the package/class name is usually unknown for
\DisableKeyvalOption. Therefore the argument for the family name is mandatory
and for some actions the package/class name must be provided.

Usually a macro would configure the option death, Example:

```latex
\ProvidesPackage{foobar}
\DeclareBoolOption{color}
\DeclareStringOption[red]{emphcolor}
\ProcessKeyvalOptions*
\newcommand*{\foobar@DisableOption}[2]{\DisableKeyvalueOption[
  action={#1}, package=foobar ]{foobar}{#2}}
\iffoobar@color
  \RequirePackage{color}
  \renewcommand*{\emph}{\textcolor{\foobar@emphcolor}{#1}}
\else
  % Option emphcolor is not wrong, if we have color support.
  % otherwise the option has no effect, but we don’t want to
  % remove it. Therefore action ‘ignore’ is the best choice:
  \foobar@DisableOption{ignore}{emphcolor}
\fi
% No we don’t need the option ‘color’.
\foobar@DisableOption{warning}{color}
% With color support option ‘emphcolor’ will dynamically
% change the color of \emph statements.
```

2.2.9 \AddToKeyvalOption

The code for an existing key `⟨key⟩` of family `⟨family⟩` is extended by code `⟨code⟩`. In
the starred form the current family setting is used, see \ProcessKeyvalOptions*.

2.3 Global vs. local options

Options that are given for \documentclass are called global options. They are
known to the class and all packages. A package may make use of a global option
and marks it as used. The advantage for the user is the freedom to specify options
both in the \documentclass or \usepackage commands.

However global options are shared with the class options and options of all
other packages. Thus there can be the same option with different semantics for
different packages and classes. As example, package bookmark knows option open
that specifies whether the bookmarks are opened or closed initially. It’s values are
ture or false. Since KOMA-Script version 3.00 the KOMA classes also introduces
option open with values right and any and a complete different meaning.

Such conflicts can be resolved by marking all or part of options as local by \DeclareLocalOption or \DeclareLocalOptions. Then the packages ignores global
occurences of these options. Package kvoptions provides two methods:
• \ProcessLocalKeyvalOptions automatically uses all options as local options. It ignores all global options.

• \DeclareLocalOption or \DeclareLocalOptions marks options as local options. \ProcessKeyvalOptions will then ignore global occurrences for these local options.

Since version 1.5 package bookmark uses the latter method. It checks global and local option places for driver options and limits all other options as local options. Thus the class option open of KOMA-Script is not misread as option for package bookmark.

2.4 Summary of internal macros

The \Declare...Option commands define macros, additionally to the macros generated by the key definition. These macros can be used by the package/class author. The name of the macros starts with the prefix ⟨prefix⟩ that can be configured by \SetupKeyvalOptions.

<table>
<thead>
<tr>
<th>Declare ⟨key⟩</th>
<th>Defined macro</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>\DeclareStringOption ⟨prefix⟩⟨key⟩</td>
<td>\⟨prefix⟩⟨key⟩</td>
<td>holds the string</td>
</tr>
<tr>
<td>\DeclareBoolOption ⟨prefix⟩⟨key⟩false</td>
<td>\if⟨prefix⟩⟨key⟩</td>
<td>boolean switch</td>
</tr>
<tr>
<td>\DeclareBoolOption ⟨prefix⟩⟨key⟩true</td>
<td>\⟨prefix⟩⟨key⟩</td>
<td>disable switch</td>
</tr>
<tr>
<td>\DeclareComplementaryOption ⟨prefix⟩⟨key⟩false</td>
<td>\⟨prefix⟩⟨key⟩false</td>
<td>enable parent switch</td>
</tr>
<tr>
<td>\DeclareComplementaryOption ⟨prefix⟩⟨key⟩true</td>
<td>\⟨prefix⟩⟨key⟩true</td>
<td>disable parent switch</td>
</tr>
<tr>
<td>\DeclareVoidOption ⟨prefix⟩⟨key⟩</td>
<td>\⟨prefix⟩⟨key⟩</td>
<td>holds the action</td>
</tr>
</tbody>
</table>

2.5 plain \TeX

Package keyval is also usable in plain \TeX with the help of file miniltx.tex. Some features of this package kvoptions might also be useful for plain \TeX. If \LaTeX is not found, \ProcessKeyvalOptions and option patch are disabled. Before using the option declaration commands \Declare...Option, \SetupKeyvalOptions must be used.

3 Example

The following example defined a package that serves some private color management. A boolean option print enables print mode without colors. An option emph redefines \texttt{\textbf{emph}} to print in the given color. And the driver can be specified by option driver.

```latex
\begin{verbatim}
\langle*{example}\rangle

% Package identification
% -----------------------
\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage{example-mycolorsetup}[2016/05/16 Managing my colors]

% Option declarations
% -------------------
\RequirePackage{ifpdf}
\RequirePackage{kvoptions}
\SetupKeyvalOptions{
  family=MCS,
  prefix=MCS@
}

% Use a shorter family name and prefix
\end{verbatim}
```
\newcommand*{\SetupDriver}{\setkeys{MCS}{driver={#1}}}
4 Package options

The package \texttt{kvoptions} knows two package options \texttt{patch} and \texttt{debugshow}. The options of package \texttt{kvoptions} are intended for authors, not for package/class writers. Inside a package it is too late for option \texttt{patch} and \texttt{debugshow} enables some messages that are perhaps useful for the debugging phase. Also \LaTeX{} is unhappy if a package is loaded later again with options that are previously not given. Thus package and class authors, stay with \texttt{\RequirePackage{kvoptions}} without options.

Option \texttt{patch} loads package \texttt{kvoptions-patch}.

4.1 Package \texttt{kvoptions-patch}

\LaTeX{}’s system of package/class options has some severe limitations that especially affects the value part if options are used as pair of key and value.

- Spaces are removed, regardless where:

  \begin{verbatim}
  \documentclass[box=0 0 400 600]{article}
  \end{verbatim}

  Now each package will see \texttt{box=00400600} as global option.

- In the previous case also braces would not help:

  \begin{verbatim}
  \documentclass[box={(0 0 400 600)}]{article}
  \end{verbatim}

  The result is an error message:

  \begin{verbatim}
  ! \LaTeX{} Error: Missing \begin{document}.
  \end{verbatim}

  As local option, however, it works if the package knows about key value options (By using this package, for example).

- The requirements on robustness are extremely high. \LaTeX{} expands the option. All that will not work as environment name will break also as option. Even a \texttt{\relax} will generate an error message:

  \begin{verbatim}
  ! Missing \texttt{\relax} inserted.
  \end{verbatim}

  Of course, \LaTeX{} does not use its protecting mechanisms. On contrary \texttt{\protect} itself will cause errors.

- The options are expanded. But perhaps the package will do that, because it has to setup some things before? Example \texttt{hyperref}: 

\end{verbatim}
\texttt{\usepackage[pdfauthor=\textbackslash M\textasciitilde uller]{hyperref}}

Package \texttt{hyperref} does not see \texttt{M\~uller} but its expansion and it does not like it, you get many warnings

\texttt{Token not allowed in a PDFDocEncoded string}

And the title becomes: \texttt{Mu127uller}. Therefore such options must usually be given after package \texttt{hyperref} is loaded:

\texttt{\usepackage\texttt{hyperref}}
\texttt{\hypersetup[pdfauthor=Fran\textasciicircum c\ coise M\textasciitilde uller]}

As package option it will even break with \texttt{Fran\textasciicircum c\ coise} because of the cedilla \texttt{\textbackslash c\ c}, it is not robust enough.

For users that do not want with this limitations the package offers package \texttt{kvoptions-patch}. It patches $\LaTeX$'s option system and tries to teach it also to handle options that are given as pairs of key and value and to prevent expansion. It can already be used at the very beginning, before \texttt{\documentclass}:  

\texttt{\RequirePackage[kvoptions-patch]}  
\texttt{\documentclass[pdfauthor=Fran\textasciicircum c\ coise M\textasciitilde uller]{article}}  
\texttt{\usepackage\texttt{hyperref}}

The latest time is before the package where you want to use problematic values:  

\texttt{\usepackage[kvoptions-patch]}  
\texttt{\usepackage[Fran\textasciicircum c\ coise M\~uller]{hyperref}}

Some remarks:

- The patch requires $\varepsilon$-\texttt{\LaTeX}, its \texttt{\unexpanded} feature is much too nice. It is possible to work around using token registers. But the code becomes longer, slower, more difficult to read and maintain. The package without option \texttt{patch} works and will work without $\varepsilon$-\texttt{\LaTeX}.

- The code for the patch is quite long, there are many test cases. Thus the probability for bugs is probably not too small.

- Since 2008/10/18 v3.0 package \texttt{kvoptions-patch} is available. Before option \texttt{patch} of package \texttt{kvoptions} must be used instead. I think, the solution as standalone package \texttt{kvoptions-patch} is cleaner and avoids option clashes.

\section*{4.2 Option \texttt{debugshow}}

The name of this option follows the convention of packages \texttt{multicol}, \texttt{tabularx}, and \texttt{tracefnt}. Currently it prints the setting of boolean options, declared by \texttt{\DeclareBoolOption} in the \texttt{.log} file, if that boolean option is used. You can activate the option by

- \texttt{\PassOptionsToPackage{debugshow}{kvoptions}}
  Put this somewhere before package \texttt{kvoptions} is loaded first, e.g. before \texttt{\documentclass}.

- \texttt{\RequirePackage{debugshow}{kvoptions}}
  Before \texttt{\documentclass} even an author has to use \texttt{\RequirePackage. \usepackage} only works after \texttt{\documentclass}.

The preferred method is \texttt{\PassOptionsToPackage}, because it does not force the package loading and does not disturb, if the package is not loaded later at all.
5 Limitations

5.1 Compatibility

5.1.1 Package kvoptions-patch vs. package xkvltxp

Package xkvltxp from the xkeyval project has the same goal as package kvoptions-patch and to patch \LaTeX's kernel commands in order to get better support for key value options. Of course they cannot be used both. The user must decide, which method he prefers. Package kvoptions-patch aborts itself, if it detects that xkvltxp is already loaded.

However package xkvltxp and kvoptions can be used together, example:

```
\usepackage{xkvltxp}
\usepackage{...}{foobar} % foobar using kvoptions
```

The other way should work, too.

Package kvoptions-patch tries to catch more situations and to be more robust. For example, during the comparison of options it normalizes them by removing spaces around \texttt{=} and the value. Thus the following is not reported as option clash:

```
\RequirePackage{kvoptions-patch}
\documentclass{article}
\usepackage[scaled=0.7]{helvet}
\usepackage[scaled = 0.7]{helvet}
\begin{document}
\end{document}
```

5.2 Limitations

5.2.1 Option comparisons

In some situations \LaTeX compares option lists, e.g. option clash check, \texttt{\@ifpackage}, or \texttt{\@ifclasswith}. Apart from catcode and sanitizing problems of option patch, there is another problem. \LaTeX does not know about the type and default values of options in key value style. Thus an option clash is reported, even if the key value has the same meaning:

```
\usepackage[scaled]{helvet} % default is .95
\usepackage[.95]{helvet}
\usepackage[0.95]{helvet}
```

5.2.2 Option list parsing with package kvoptions-patch

With package kvoptions-patch the range of possible values in key value specifications is much large, for example the comma can be used, if enclosed in curly braces.

Other packages, especially the packages that uses their own process option code can be surprised to find tokens inside options that they do not expect and errors would be the consequence. To avoid errors the options, especially the unused option list is sanitized. That means the list will only contain tokens with catcode 12 (other) and perhaps spaces (catcode 10). This allows a safe parsing for other packages. But a comma in the value part is no longer protected by curly braces because they have lost their special meaning. This is the price for compatibility.

Example:

```
\RequirePackage{kvoptions-patch}
\documentclass[a={a,b,c},b]{article}
\begin{document}
\end{document}
```
6 Implementation

6.1 Preamble

Reload check and identification. Reload check, especially if the package is not used with \LaTeX.

\begin{verbatim}
\begingroup\catcode61\catcode48\catcode32=10\relax%
\catcode13=5 \^^M
\endlinechar=13 %
\catcode35=6 % #
\catcode39=12 % '
\catcode44=12 % ,
\catcode45=12 % -
\catcode46=12 % .
\catcode58=12 % :
\catcode64=11 % @
\catcode123=1 % {
\catcode125=2 % }
\expandafter\let\expandafter\x\csname ver@kvoptions.sty\endcsname
\ifx\x\relax % plain-\TeX, first loading
\else
\def\empty{}
\ifx\x\empty % \LaTeX, first loading, \ProvidesPackage not yet seen
\else
\expandafter\ifx\csname PackageInfo\endcsname\relax
\def\x#1#2{%
\immediate\write-1{Package #1 Info: #2.}%
}
\else
\def\x#1#2{\PackageInfo{#1}{#2, stopped}}%
\fi
\x{kvoptions}{The package is already loaded}%
\aftergroup\endinput
\fi
\fi
\endgroup%
\end{verbatim}

Package identification:

\begin{verbatim}
\begingroup\catcode61\catcode48\catcode32=10\relax%
\catcode13=5 \^^M
\endlinechar=13 %
\catcode35=6 % #
\catcode39=12 % '
\catcode44=12 % ,
\catcode45=12 % -
\catcode46=12 % .
\catcode58=12 % :
\catcode64=11 % @
\catcode91=12 % [
\catcode93=12 % ]
\catcode123=1 % {
\catcode125=2 % }
\end{verbatim}
\expandafter\ifx\csname ProvidesPackage\endcsname\relax
\def\x#1#2#3[#4]{\endgroup
  \immediate\write-1{Package: #3 #4}\
  \xdef#1{#4}\
}\else
\def\x#1#2[#3]{\endgroup
  #2[#3]\
  \ifx#1\@undefined
    \xdef#1{#3}\
  \fi
  \ifx#1\relax
    \xdef#1{#3}\
  \fi
}\fi
\expandafter\x\csname ver@kvoptions.sty\endcsname
\ProvidesPackage{kvoptions}\
[2016/05/16 v3.12 Key value format for package options (HO)]
\catcode61\catcode48\catcode32=10\relax\
\catcode13=5 % ^^M
\endlinechar=13 %
\catcode123=1 % {
\catcode125=2 % }
\catcode64=11 % @
\def\x{
\expandafter\edef\csname KVO@AtEnd\endcsname{\endlinechar=\the\endlinechar\relax
  \catcode13=\the\catcode13\relax
  \catcode32=\the\catcode32\relax
  \catcode35=\the\catcode35\relax
  \catcode61=\the\catcode61\relax
  \catcode64=\the\catcode64\relax
  \catcode123=\the\catcode123\relax
  \catcode125=\the\catcode125\relax
}\
\x\catcode61\catcode48\catcode32=10\relax%
\catcode13=5 % ^^M
\endlinechar=13 %
\catcode123=1 % {
\catcode125=2 % }
\def\x{
\expandafter\edef\csname KVO@AtEnd\endcsname{\endlinechar=\the\endlinechar\relax
  \catcode13=\the\catcode13\relax
  \catcode32=\the\catcode32\relax
  \catcode35=\the\catcode35\relax
  \catcode61=\the\catcode61\relax
  \catcode64=\the\catcode64\relax
  \catcode123=\the\catcode123\relax
  \catcode125=\the\catcode125\relax
}\
\x\catcode61\catcode48\catcode32=10\relax%
\catcode35=6 % #
\catcode64=11 % @
\catcode123=1 % {
\catcode125=2 % }
\def\x{
\edef\KVO@AtEnd{\KVO@AtEnd
  \catcode1=\the\catcode1\relax
  \catcode2=\the\catcode2\relax
  \catcode3=\the\catcode3\relax
  \catcode4=\the\catcode4\relax
  \catcode5=\the\catcode5\relax
  \catcode6=\the\catcode6\relax
  \catcode7=\the\catcode7\relax
  \catcode8=\the\catcode8\relax
  \catcode9=\the\catcode9\relax
  \catcode10=\the\catcode10\relax
  \catcode11=\the\catcode11\relax
  \catcode12=\the\catcode12\relax
  \catcode13=\the\catcode13\relax
  \catcode14=\the\catcode14\relax
  \catcode15=\the\catcode15\relax
  \catcode\@=\the\catcode\@elax
  \catcode\^=\the\catcode\^elax
  \catcode\_=\the\catcode\_=\relax
  \catcode\+=\the\catcode\+=\relax
  \catcode\-=\the\catcode\-=\relax
  \catcode\*=\the\catcode\*=\relax
  \catcode\,=\the\catcode\,=\relax
  \catcode\%=\the\catcode\%=\relax
  \catcode\?=\the\catcode\?=\relax
  \catcode\|=\the\catcode\|=\relax
  \catcode\<@=\the\catcode\<@=\relax
  \catcode\>=\the\catcode\>=\relax
  \catcode\!@=\the\catcode\!@=\relax
  \catcode\#{\the\catcode\#{\relax
  \catcode\%=\the\catcode\%=\relax
  \catcode\{}=\the\catcode\{}=\relax
  \catcode\}=\the\catcode\}=\relax
  \catcode\64=\the\catcode\64=\relax
  \catcode\123=\the\catcode\123=\relax
  \catcode\125=\the\catcode\125=\relax
  \catcode\147=\the\catcode\147=\relax
  \catcode\148=\the\catcode\148=\relax
  \catcode\149=\the\catcode\149=\relax
  \catcode\150=\the\catcode\150=\relax
  \catcode\151=\the\catcode\151=\relax
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  \catcode\168=\the\catcode\168=\relax
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  \catcode\170=\the\catcode\170=\relax
  \catcode\171=\the\catcode\171=\relax
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  \catcode\182=\the\catcode\182=\relax
  \catcode\183=\the\catcode\183=\relax
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  \catcode\186=\the\catcode\186=\relax
  \catcode\187=\the\catcode\187=\relax
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  \catcode\189=\the\catcode\189=\relax
  \catcode\190=\the\catcode\190=\relax
  \catcode\191=\the\catcode\191=\relax
  \catcode\192=\the\catcode\192=\relax
  \catcode\193=\the\catcode\193=\relax
  \catcode\194=\the\catcode\194=\relax
  \catcode\195=\the\catcode\195=\relax
  \catcode\196=\the\catcode\196=\relax
  \catcode\197=\the\catcode\197=\relax
  \catcode\198=\the\catcode\198=\relax
  \catcode\199=\the\catcode\199=\relax
  \catcode\200=\the\catcode\200=\relax
  \catcode\201=\the\catcode\201=\relax
  \catcode\202=\the\catcode\202=\relax
  \catcode\203=\the\catcode\203=\relax
  \catcode\204=\the\catcode\204=\relax
  \catcode\205=\the\catcode\205=\relax
  \catcode\206=\the\catcode\206=\relax
\TMP@EnsureCode{1}{14} \relax % ^A (comment)
\TMP@EnsureCode{2}{14} \relax % ^A (comment)
\TMP@EnsureCode{3}{12} \relax !
\TMP@EnsureCode{39}{12} \relax '
\TMP@EnsureCode{40}{12} \relax (}
\TMP@EnsureCode{41}{12} \relax )
\TMP@EnsureCode{42}{12} \relax *
\TMP@EnsureCode{44}{12} \relax ,
\TMP@EnsureCode{45}{12} \relax -
External resources. The package extends the support for key value pairs of package \keyval to package options. Thus the package needs to be loaded anyway and we use it for \SetupKeyvalOptions. AFAIK this does not disturb users of xkeyval.

\@ifundefined{define@key}{%\RequirePackage{keyval}\relax%}
\DefineLocalOptions parses a comma separated key list and uses \comma@parse of package kvsetkeys, version 1.3.
\RequirePackage{ltxcmds}[2010/12/02]
\RequirePackage{kvsetkeys}[2007/09/29]

Provide macros for plain \TeX.
\@ifundefined{@x@protect}{%\def\@x@protect#1\fi#2#3{%\fi\protect#1%}
\let\@typeset@protect\relax%}
\@ifundefined{@currname}{%\def\@currname{}%}
\@ifundefined{@currext}{%\def\@currext{}%}
\Option{debugshow}{\catcode\@ne=9}
\Option{patch}{%\AtEndOfPackage{\RequirePackage{kvoptions-patch}[2016/05/16]%}
\ProcessOptions\relax

\section{Option declaration macros}
\subsection{\SetupKeyvalOptions}
The family for the key value pairs can be setup once and is remembered later. The package name seems a reasonable default for the family key, if it is not set by the package author.
\KVO@family We cannot store the family setting in one macro, because the package should be usable for many other packages, too. Thus we remember the family setting in a
macro, whose name contains the package name with extension, a key in \LaTeX’s class/package system.

240 \define@key{KVO}{family}{%
241 \expandafter\edef\csname KVO@family@\@currname.\@currext\endcsname{#1}%
242 }
243 \def\KVO@family{%
244 \@ifundefined{KVO@family@\@currname.\@currext}{%
245 \@currname
246 \}(%
247 \csname KVO@family@\@currname.\@currext\endcsname
248 )%
249 }
250 }

\KVO@prefix The value settings of options that are declared by \DeclareBoolOption and \DeclareStringOption need to be saved in macros. in the first case this is a switch \if⟨prefix⟩⟨key⟩, in the latter case a macro \langleprefix⟩⟨key⟩. The prefix can be configured, by prefix that is declared here. The default is the package name with @ appended.

251 \define@key{KVO}{prefix}{%
252 \expandafter\edef\csname KVO@prefix@\@currname.\@currext\endcsname{#1}%
253 }
254 \def\KVO@prefix{%
255 \ltx@ifundefined{KVO@prefix@\@currname.\@currext}{%
256 \@currname @%
257 \}(%
258 \csname KVO@prefix@\@currname.\@currext\endcsname
259 )%
260 }
261 }

\KVO@setkeys

262 \define@key{KVO}{setkeys}{%
263 \expandafter\edef\csname KVO@setkeys@\@currname.\@currext\endcsname{#1}%
264 }
265 \def\KVO@setkeys{%
266 \ltx@ifundefined{KVO@setkeys@\@currname.\@currext}{%
267 \setkeys
268 \}(%
269 \csname KVO@setkeys@\@currname.\@currext\endcsname
270 )%
271 }
272 }

\SetupKeyvalOptions The argument of \SetupKeyvalOptions expects a key value list, known keys are family and prefix.

273 \newcommand*{\SetupKeyvalOptions}{%
274 \kvsetkeys{KVO}%
275 }

6.2.2 \DeclareBoolOption

\DeclareBoolOption Usually options of boolean type can be given by the user without value and this means a setting to true. We follow this convention here. Also it simplifies the user interface.

The switch is created and initialized with false. The default setting can be overwritten by the optional argument.

\LaTeX’s \newif does not check for already defined macros, therefore we add this check here to prevent the user from accidently redefining \TeX’s primitives and other macros.
\newcommand*{\DeclareBoolOption}[2][false]{%
  \KVO@ifdefinable{if\KVO@prefix#2}{%
    \KVO@ifdefinable{\KVO@prefix#2true}{%
      \csname newif\expandafter\endcsname
      \csname if\KVO@prefix#2\endcsname
      \ifundefined{\KVO@prefix#2#1}{{%}
        \PackageWarning{kvoptions}{%
          Initialization of option `#2' failed,\MessageBreak
          cannot set boolean option to `#1',\MessageBreak
          use `true' or `false', now using `false'%
        }}{%}
      \csname\KVO@prefix#2#1\endcsname
    }{%}
    \begingroup
      \edef\x{\endgroup
        \noexpand\define@key{\KVO@family}{#2}[true]{%}
        \noexpand\KVO@boolkey{\@currname}%
        \ifx\@currext\@clsextension
          \noexpand\@clsextension
        \else
          \noexpand\@pkgextension
        \fi
        {\KVO@prefix}{#2}{####1}%
    }%
  }{%}
  \begingroup
  \edef\x{\endgroup
    \noexpand\define@key{\KVO@family}{#2}[true]{%}
    \noexpand\KVO@boolkey{\@currname}%
    \ifx\@currext\@clsextension
      \noexpand\@clsextension
    \else
      \noexpand\@pkgextension
    \fi
    {\KVO@prefix}{#2}{####1}%
  }%
  }%
  }%
}

\newcommand*{\DeclareComplementaryOption}[2]{%
  \@ifundefined{if\KVO@prefix#2}{%
    \PackageError{kvoptions}{%
      Cannot generate option code for `#1',\MessageBreak
      parent switch `#2' does not exist%
    }}{%}
  \KVO@ifdefinable{if\KVO@prefix#1}{%
    \KVO@ifdefinable{\KVO@prefix#1true}{%
      \expandafter\let\csname\KVO@prefix#1false\expandafter\endcsname
      \csname\KVO@prefix#2true\endcsname
      \expandafter\let\csname\KVO@prefix#1true\expandafter\endcsname
      \csname\KVO@prefix#2false\endcsname
    }{%}
    \begingroup
  \endgroup
  \edef\x{\endgroup
    \noexpand\define@key{\KVO@family}{#2}[true]{%}
    \noexpand\KVO@boolkey{\@currname}%
    \ifx\@currext\@clsextension
      \noexpand\@clsextension
    \else
      \noexpand\@pkgextension
    \fi
    {\KVO@prefix}{#2}{####1}%
  }%
  }%
  }%
}

\DeclareComplementaryOption

The first argument is the key name, the second the key that must be a boolean option with the same current family and prefix. A new switch is not created for the new key, we have already a switch. Instead we define switch setting commands to work on the parent switch.

\newcommand*{\DeclareComplementaryOption}[2]{%
  \@ifundefined{if\KVO@prefix#2}{%
    \PackageError{kvoptions}{%
      Cannot generate option code for `#1',\MessageBreak
      parent switch `#2' does not exist%
    }}{%}
  \KVO@ifdefinable{if\KVO@prefix#1}{%
    \KVO@ifdefinable{\KVO@prefix#1true}{%
      \expandafter\let\csname\KVO@prefix#1false\expandafter\endcsname
      \csname\KVO@prefix#2true\endcsname
      \expandafter\let\csname\KVO@prefix#1true\expandafter\endcsname
      \csname\KVO@prefix#2false\endcsname
    }{%}
    \begingroup
  \endgroup
  \edef\x{\endgroup
    \noexpand\define@key{\KVO@family}{#2}[true]{%}
    \noexpand\KVO@boolkey{\@currname}%
    \ifx\@currext\@clsextension
      \noexpand\@clsextension
    \else
      \noexpand\@pkgextension
    \fi
    {\KVO@prefix}{#2}{####1}%
  }%
  }%
  }%
}

The same code part as in \DeclareBoolOption can now be used.
\edef\x{\endgroup}
\noexpand\define@key{\KVO@family}{#1}{\true}{%
\noexpand\KVO@boolkey{\currname}{% 
\if\current\@clsextension 
\noexpand\@clsextension 
\else 
\noexpand\@pkgextension 
\fi 
\KVO@prefix{#1}{####1}{% 
\x 
\}% 
\}% 
\}% 
}
\x

\KVO@ifdefinable Generate the command token LaTeX’s \@ifdefinable expects.
\def\KVO@ifdefinable#1{%
\expandafter\@ifdefinable\csname #1\endcsname
}

\KVO@boolkey We check explicitly for \texttt{true} and \texttt{false} to prevent the user from accidently calling other macros.
\begin{verbatim}
#1 package/class name
#2 \@pkgextension/\@clsextension
#3 prefix
#4 key name
#5 new value
\end{verbatim}
\def\KVO@boolkey#1#2#3#4#5{%
\edef\KVO@param{#5}%
\ltx@onelevel@sanitize\KVO@param
\ifx\KVO@param\KVO@true
\expandafter\@firstofone
\else
\ifx\KVO@param\KVO@false
\expandafter\expandafter\expandafter\@firstofone
\else
\ifx#2\@clsextension
\expandafter\PackageWarning
\else
\expandafter\PackageWarning
\fi
\expandafter\expandafter\expandafter\@gobble
\fi
\fi
\fi
\expandafter\expandafter\expandafter\@gobble
\fi
\expandafter\expandafter\expandafter\@gobble
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\expandafter\expandafter\expandafter\@gobble
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\expandafter\expandafter\expandafter\@gobble
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\expandafter\expandafter\expandafter\@gobble
\fi
\expandafter\expandafter\expandafter\@gobble
\fi
\KVO@true and \KVO@false are used for string comparisons. After \lt@onelevel@sanitize we have only tokens with catcode 12 (other).

\begin{verbatim}
def\KVO@true{true}
def\KVO@false{false}
\end{verbatim}

6.2.3 \texttt{\DeclareStringOption}

\begin{verbatim}
def\KVO@DeclareStringOption#1#2#3#4
def\KVO@DeclareStringOption#1#2#3[@]{\begingroup\toks@{}\else\toks@{[\#3]}\fi\edef\x{\endgroup\noexpand\define@key{\KVO@family}{#2}\the\toks@{\^^A\begingroup\^^A \toks@{####1}\ifx\@currext\@clsextension\noexpand\ClassInfo\else\noexpand\PackageInfo\fi{\@currname}{\[option\] #2={\noexpand\the\toks@}}\endgroup\noexpand\def\expandafter\noexpand\csname\KVO@prefix#2\endcsname{####1}}\x}
\end{verbatim}

6.2.4 \texttt{\DeclareVoidOption}

\begin{verbatim}
def\KVO@DeclareVoidOption#1#2#3[#4]{\begingroup\let\next\@gobbletwo\if\ifdefinable{\KVO@prefix#2}{\let\next\@firstofone}\expandafter\endgroup\next{\begingroup\edef\x{\endgroup\noexpand\define@key{\KVO@family}{#2}\the\toks@{\^^A\begingroup\^^A \toks@{####1}\ifx\@currext\@clsextension\noexpand\ClassInfo\else\noexpand\PackageInfo\fi{\@currname}{\[option\] #2={\noexpand\the\toks@}}\endgroup\noexpand\def\expandafter\noexpand\csname\KVO@prefix#2\endcsname{####1}}\x}}
\end{verbatim}
\KVO@voidkey \#1\package/class name \#2\@pkgextension/\@clsextension \#3key name \#4default (@VOID@) \#5macro with option code \def\KVO@voidkey\#1\#2\#3\#4{\%\def\CurrentOption{\#3\%\begingroup\def\x{\#4}\expandafter\endgroup\if\x\KVO@VOID@\else\if\#2\@clsextension\expandafter\ClassWarning\else\expandafter\PackageWarning\fi\fi\expandafter\noexpand\csname KVO@prefix\#1\endcsname\}%\}%%
\x\begingroup\toks\{\#2\}%\expandafter\endgroup\expandafter\def\csname KVO@prefix\#1\expandafter\endcsname\expandafter{\the\toks\}%\}%\}
def\KVO@VOID@{VOID@}
\newcommand*{\DeclareDefaultOption}{%\@namedef{KVO@default@\@currname.\@currext}}

6.2.5 \DeclareDefaultOption
\DeclareDefaultOption
6.2.6 \texttt{\textbackslash DeclareLocalOptions}

\texttt{\textbackslash DeclareLocalOptions}

\begin{verbatim}
481 \newcommand\{\DeclareLocalOptions\}[1]{{% \comma@parse{\#1}\KVO@DeclareLocalOption 
482 }}
\end{verbatim}

6.3 Dynamic options

6.3.1 \texttt{\textbackslash DisableKeyvalOption}

\begin{verbatim}
487 \SetupKeyvalOptions{% 
488 family=KVOdyn,% 
489 prefix=KVOdyn@% 
490 }
\DeclareBoolOption[true]{global}
\DeclareComplementaryOption{local}{global}
\DeclareStringOption[undef]{action}
\let\KVOdyn@name\relax
\let\KVOdyn@ext\@empty
\define@key{KVOdyn}{class}{% 
\def\KVOdyn@name{#1}% 
\let\KVOdyn@ext\@clsextension
\}
\define@key{KVOdyn}{package}{% 
\def\KVOdyn@name{#1}% 
\let\KVOdyn@ext\@pkgextension
\}
\newcommand\{\DisableKeyvalOption\}[3]{{% 
\begin{group}
\kvsetkeys{KVOdyn}{#1}% 
\def\x{\endgroup}%
\@ifundefined{KVO@action@\KVOdyn@action}{% 
\PackageError{kvoptions}{% 
Unknown disable action \expandafter\strip@prefix\meaning\KVOdyn@action'\MessageBreak 
for option `#3' in keyval family `#2'\MessageBreak 
\}@ehc
}{% 
\csname KVO@action@\KVOdyn@action\endcsname{#2}{#3}%
\x%
}
\edef\x{\endgroup 
\ifKVOdyn@global\global\fi 
\let \expandafter\noexpand\csname KV@#1@#2\endcsname 
\relax 
\ifKVOdyn@global\global\fi 
\let \expandafter\noexpand\csname KV@#1@#2@default\endcsname 
\relax 
\}
\PackageInfo{kvoptions}{% 
\[option\] key `#2' of family `#1'\MessageBreak 
\}%
\x%
\end{group}
\def\KVOdyn@action@undef#1#2{% 
\edef\x{\endgroup 
\ifKVOdyn@global\global\fi 
\let \expandafter\noexpand\csname KV@#1@#2\endcsname 
\relax 
\ifKVOdyn@global\global\fi 
\let \expandafter\noexpand\csname KV@#1@#2@default\endcsname 
\relax 
\}
\PackageInfo{kvoptions}{% 
\[option\] key `#2' of family `#1'\MessageBreak 
\}%
\x%
\end{verbatim}

22
\def\KVO@action@ignore#1#2{%  \edef\x{\endgroup\ifKVOdyn@global\global\fi}
  \let\expandafter\noexpand\csname KV@#1@#2\endcsname\noexpand\@gobble
  \ifKVOdyn@global\global\fi\let\expandafter\noexpand\csname KV@#1@#2@default\endcsname\noexpand\@empty
}%
\PackageInfo{kvoptions}{% A [option] key `#2' of family `#1'
  \if\ifKVOdyn@global global\else local\fi\MessageBreak A\%}
\def\KVO@action@error{%\KVO@do@action{error}{}
\def\KVO@action@warning{%\KVO@do@action{warning}{}
\#1 error or warning
\#2 \langle family \rangle
\#3 \langle key \rangle
\def\KVO@do@action#1#2#3{\ifx\KVOdyn@name\relax
  \PackageError{kvoptions}{% Action type `#1' needs package/class name for key `#3' in family `#2'
\else\edef\x{\endgroup\noexpand\define@key{#2}{#3}{%\expandafter\noexpand\csname KVO@disable@#1\endcsname{\KVOdyn@name}\noexpand\KVOdyn@ext{#3}}%\ifKVOdyn@global
  \global\let\expandafter\noexpand\csname KV@#2@#3\endcsname\expandafter\noexpand\csname KV@#2@#3\endcsname
  \global\let\expandafter\noexpand\csname KV@#2@#3@default\endcsname\expandafter\noexpand\csname KV@#2@#3@default\endcsname
  \fi\fi\ifx\KVOdyn@ext\@clsextension
  \expandafter\ClassError
  \else\expandafter\PackageInfo\fi\KVOdyn@name{% A [option] key `#3' of family `#2'
  \if\ifKVOdyn@global global\else local\fi\MessageBreak A\%}
\fi\fi%
\def\KVO@disable@error#1#2#3{\ifx#2\@clsextension
  \expandafter\ClassError
  \else\expandafter\PackageInfo\fi\KVOdyn@name{%
  \MessageBreak \if\ifKVOdyn@global global\else local\fi\MessageBreak}
\else\edef\x{\endgroup\ifKVOdyn@name\relax
  \PackageError{kvoptions}{% Action type `#1' needs package/class name
\else\edef\x{\endgroup\noexpand\define@key{#2}{#3}{%\expandafter\noexpand\csname KVO@disable@#1\endcsname{\KVOdyn@name}\noexpand\KVOdyn@ext{#3}}%\ifKVOdyn@global
  \global\let\expandafter\noexpand\csname KV@#2@#3\endcsname\expandafter\noexpand\csname KV@#2@#3\endcsname
  \global\let\expandafter\noexpand\csname KV@#2@#3@default\endcsname\expandafter\noexpand\csname KV@#2@#3@default\endcsname
  \fi\fi\ifx\KVOdyn@ext\@clsextension
  \expandafter\ClassError
  \else\expandafter\PackageInfo\fi\KVOdyn@name{%
  \MessageBreak \if\ifKVOdyn@global global\else local\fi\MessageBreak}
\fi\fi%
\def\KVO@do@disable{%\expandafter\PackageWarning
  \PackageWarning{kvoptions}{% A [option] key `#3' of family `#2'
  \if\ifKVOdyn@global global\else local\fi\MessageBreak A\%}
\def\KVO@do@disable{%\expandafter\PackageWarning
  \PackageWarning{kvoptions}{% A [option] key `#3' of family `#2'
  \if\ifKVOdyn@global global\else local\fi\MessageBreak A\%}
\fi\fi%
\iffalse\KVOdyn@name\relax
  \PackageError{kvoptions}{% A [option] key `#3' of family `#2'
\else\edef\x{\endgroup\noexpand\define@key{#2}{#3}{%\expandafter\noexpand\csname KVO@disable@#1\endcsname{\KVOdyn@name}\noexpand\KVOdyn@ext{#3}}%\ifKVOdyn@global
  \global\let\expandafter\noexpand\csname KV@#2@#3\endcsname\expandafter\noexpand\csname KV@#2@#3\endcsname
  \global\let\expandafter\noexpand\csname KV@#2@#3@default\endcsname\expandafter\noexpand\csname KV@#2@#3@default\endcsname
  \fi\fi\ifx\KVOdyn@ext\@clsextension
  \expandafter\ClassError
  \else\expandafter\PackageInfo\fi\KVOdyn@name{%
  \MessageBreak \if\ifKVOdyn@global global\else local\fi\MessageBreak}
\fi\fi%
\def\KVO@do@disable{%\expandafter\PackageWarning
  \PackageWarning{kvoptions}{% A [option] key `#3' of family `#2'
  \if\ifKVOdyn@global global\else local\fi\MessageBreak A\%}
\def\KVO@do@disable{%\expandafter\PackageWarning
  \PackageWarning{kvoptions}{% A [option] key `#3' of family `#2'
  \if\ifKVOdyn@global global\else local\fi\MessageBreak A\%}
\fi\fi%
\iffalse\KVOdyn@name\relax
  \PackageError{kvoptions}{% A [option] key `#3' of family `#2'
\else\edef\x{\endgroup\noexpand\define@key{#2}{#3}{%\expandafter\noexpand\csname KVO@disable@#1\endcsname{\KVOdyn@name}\noexpand\KVOdyn@ext{#3}}%\ifKVOdyn@global
  \global\let\expandafter\noexpand\csname KV@#2@#3\endcsname\expandafter\noexpand\csname KV@#2@#3\endcsname
  \global\let\expandafter\noexpand\csname KV@#2@#3@default\endcsname\expandafter\noexpand\csname KV@#2@#3@default\endcsname
  \fi\fi\ifx\KVOdyn@ext\@clsextension
  \expandafter\ClassError
  \else\expandafter\PackageInfo\fi\KVOdyn@name{%
  \MessageBreak \if\ifKVOdyn@global global\else local\fi\MessageBreak}
\fi\fi%
\iffalse\KVOdyn@name\relax
  \PackageError{kvoptions}{% A [option] key `#3' of family `#2'
\else\edef\x{\endgroup\noexpand\define@key{#2}{#3}{%\expandafter\noexpand\csname KVO@disable@#1\endcsname{\KVOdyn@name}\noexpand\KVOdyn@ext{#3}}%\ifKVOdyn@global
  \global\let\expandafter\noexpand\csname KV@#2@#3\endcsname\expandafter\noexpand\csname KV@#2@#3\endcsname
  \global\let\expandafter\noexpand\csname KV@#2@#3@default\endcsname\expandafter\noexpand\csname KV@#2@#3@default\endcsname
  \fi\fi\ifx\KVOdyn@ext\@clsextension
  \expandafter\ClassError
  \else\expandafter\PackageInfo\fi\KVOdyn@name{%
  \MessageBreak \if\ifKVOdyn@global global\else local\fi\MessageBreak}
\fi\fi%
\iffalse\KVOdyn@name\relax
  \PackageError{kvoptions}{% A [option] key `#3' of family `#2'
\else\edef\x{\endgroup\noexpand\define@key{#2}{#3}{%\expandafter\noexpand\csname KVO@disable@#1\endcsname{\KVOdyn@name}\noexpand\KVOdyn@ext{#3}}%\ifKVOdyn@global
  \global\let\expandafter\noexpand\csname KV@#2@#3\endcsname\expandafter\noexpand\csname KV@#2@#3\endcsname
  \global\let\expandafter\noexpand\csname KV@#2@#3@default\endcsname\expandafter\noexpand\csname KV@#2@#3@default\endcsname
  \fi\fi\ifx\KVOdyn@ext\@clsextension
  \expandafter\ClassError
  \else\expandafter\PackageInfo\fi\KVOdyn@name{%
  \MessageBreak \if\ifKVOdyn@global global\else local\fi\MessageBreak}
\fi\fi%
\expandafter\PackageError\fi\{#1\}{%
\PackageWarning{\string\AddToKeyvalOption}{Option `#3' is already consumed\MessageBreak
and has no effect%}
\@ifstar{\begingroup\edef\x{\endgroup\noexpand\KVO@AddToKeyvalOption{\KVO@family}}\x}{\KVO@AddToKeyvalOption}

6.4 Change option code
6.4.1 \AddToKeyvalOption

\AddToKeyvalOption\newcommand*{\AddToKeyvalOption}{%\@ifstar{\begingroup\edef\x{\endgroup\noexpand\KVO@AddToKeyvalOption{\KVO@family}}\x}{\KVO@AddToKeyvalOption}
\def\KVO@AddToKeyvalOption#1#2{\@ifundefined{KV@#1@#2}{\PackageWarning{kvoptions}{\string\AddToKeyvalOption}{\string\AddToKeyvalOption}{Key `#2' of family `#1' does not exist.\MessageBreak
Ignoring \string\AddToKeyvalOption%}
\@gobble}{\edef\KVO@next{\noexpand\KVO@@AddToKeyvalOption\expandafter\noexpand\csname KV@#1@#2\endcsname}\afterassignment\KVO@next\def\KVO@temp##1{}}}
\KVO@@AddToKeyvalOption\def\KVO@@AddToKeyvalOption#1{\begingroup\toks@\expandafter{#1{##1}}\toks@\expandafter{\the\expandafter\toks@\KVO@temp{##1}}\edef\x{\endgroup\noexpand#1####1{\the\toks@}%%%}%}
\x}
6.5 Process options
6.5.1 Get global options
Package xkeyval removes options with equal signs from the global options \(\@classoptionslist\). The effect is that other packages and classes will not see these global options anymore. A bug-report was answered that this behaviour is “by design”. Thus I call it a design bug. Now getting the global options require an algorithm instead of a simple macro call.

\KVO@GetClassOptionsList

6.5.2 \ProcessKeyvalOptions
If the optional star is given, we get the family name and expand it for safety.

\ProcessKeyvalOptions
Add any global options that are known to KV to the start of the list being built in \texttt{KV@temp} and mark them used (by removing them from the unused option list).

\begin{verbatim}
688 \ifx\@currext\@clsextension
689 \else
690 \KVO@GetClassOptionsList
691 \fi
692 \KVO@classoptionslist\relax
693 \else
694 \@for\KVO@CurrentOption:=\KVO@classoptionslist\do{\% 
695 \ifundefined{KV@\#1@\expandafter\KVO@getkey
696 \KVO@CurrentOption=}{@nil}{\% 
697 \ifundefined{KVO@local@\#1@\expandafter\KVO@getkey
698 \KVO@CurrentOption=}{@nil}{\% 
699 \ifx\@currext\@clsextension
700 \edef\KVO@temp{\% 
701 \etex@unexpanded\expandafter{\% 
702 \KVO@CurrentOption 
703 \}\% 
704 \etex@unexpanded\expandafter{\% 
705 \KVO@CurrentOption 
706 \}\% 
707 \etex@unexpanded\expandafter{\% 
708 \KVO@CurrentOption 
709 \}\% 
710 \etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@un expanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded\etex@unexpanded
711 \else
712 \edef\KVO@temp{\% 
713 \KVO@temp 
714 ,\% 
715 \KVO@CurrentOption 
716 ,\% 
717 )\% 
718 \fi
719 \@expandtwoargs\@removeelement\KVO@CurrentOption
720 \@unusedoptionlist\@unusedoptionlist
721 )\% 
722 )\% 
723 )\% 
724 \fi
725 \fi
\end{verbatim}

Now stick the package options at the end of the list and wrap in a call to \texttt{\setkeys}. A class ignores unknown global options, we must remove them to prevent error messages from \texttt{\setkeys}.

\begin{verbatim}
726 \begingroup
727 \toks\tw@{}\% 
728 \@ifundefined{opt\@\@currname.\@currext}{\% 
729 \toks\@expandafter{\KVO@temp}\% 
730 )\% 
731 \toks\@expandafter{\expandafter\expandafter{\% 
732 \csname opt\@\@currname.\@currext\endcsname 
733 )\% 
734 \ifx\@currext\@clsextension
735 \edef\CurrentOption{\the\toks}\% 
736 \toks\@expandafter{\KVO@temp}\% 
737 \@for\CurrentOption:=\CurrentOption\do{\% 
738 \@ifundefined{\% 
739 \KVO@\#1@\expandafter\KVO@getkey\CurrentOption=}{@nil 
740 )\% 
\end{verbatim}

A class puts not used options in the unused option list unless there is a default handler.
Without default action we pass all options to \setkeys. Otherwise we have to check which options are known. These are passed to \setkeys. For the others the default action is performed.

Some cleanup of \ProcessOptions.
6.5.3 \ProcessLocalKeyvalOptions

\ProcessLocalKeyvalOptions

If the optional star is given, we get the family name and expand it for safety.

\newcommand*{\ProcessLocalKeyvalOptions}{%  
\@ifstar{%  
\begingroup  
\edef\x{\endgroup
\noexpand\KVO@ProcessLocalKeyvalOptions{\KVO@family}}%  
\x  
\}%  
\KVO@ProcessLocalKeyvalOptions
\}  

\def\KVO@ProcessLocalKeyvalOptions#1{%  
\let\@tempc\relax  
\let\KVO@temp\@empty  
\Check if \ProcessLocalKeyvalOptions is called inside a package.  
\ifx\@currext\@pkgextension  
\else  
\PackageError{kvoptions}{\string\ProcessLocalKeyvalOptions space is intended for packages only}%  
\fi  
The package options are put into toks register \toks@.  
\begingroup  
\toks\tw@{}%  
\@ifundefined{opt@\@currname.\@currext}{%  
\toks@\expandafter{\KVO@temp}%  
\}  
\toks@\expandafter\expandafter\expandafter{\csname opt@\@currname.\@currext\endcsname}  
Without default action we pass all options to \setkeys. Otherwise we have to  
check which options are known. These are passed to \setkeys. For the others the  
default action is performed.  
\@ifundefined{KVO@default@\@currname.\@currext}{%  
\toks@\expandafter\expandafter\expandafter{\expandafter\KVO@temp\the\toks@}%  
\CurrentOption{\the\toks@}  
\toks@\expandafter{\KVO@temp}\the\toks@  
\}  
\}  
\toks@\expandafter\expandafter\expandafter{\expandafter\KVO@temp\the\toks@}%  
\CurrentOption\tw@\expandafter\expandafter\expandafter{\expandafter\KVO@getkey\CurrentOption=\@nil}%  
\toks@\expandafter\expandafter\expandafter{\expandafter\the\toks@\expandafter,\CurrentOption}%  
\toks@\expandafter{\expandafter\the\toks@\expandafter,\CurrentOption}%  
\}  
\}  
\toks@\expandafter\expandafter\expandafter{\expandafter\the\toks@\expandafter,\CurrentOption}%  
\}  
\}  
\}  
\edef\KVO@temp{\endgroup
\noexpand\KVO@calldefault{\the\toks\tw@}%  
\noexpand\KVO@setkeys{#1}{\the\toks@}%
Some cleanup of \ProcessOptions.
\let\CurrentOption@empty
\AtEndOfPackage{\let@unprocessedoptions\relax}\
\}

6.5.4 Helper macros

\KVO@getkey Extract the key part of a key=value pair.
\def\KVO@getkey#1=#2@nil{#1}

\KVO@calldefault
\def\KVO@calldefault#1{\
\begingroup\
\def\x{#1}\
\expandafter\endgroup\
\ifx\x\@empty\
\else\
\@for\CurrentOption:=#1\do{\
\ifx\CurrentOption\@empty\
\else\
\expandafter\KVO@setcurrents\CurrentOption=\@nil\
\@nameuse{KVO@default@\@currname.@\@currext}\fi\fi\fi\fi\fi\fi\fi\fi\fi

\KVO@setcurrents Extract the key part of a key=value pair.
\def\KVO@setcurrents#1=#2@nil{\def\CurrentOptionValue{#2}\
\ifx\CurrentOptionValue\@empty\
\let\CurrentOptionKey\CurrentOption\
\let\CurrentOptionValue\relax\else\edef\CurrentOptionKey{\zap@space#1\@empty}\
\expandafter\KVO@setcurrentvalue\CurrentOption@nil\fi\fi\fi\fi\fi\fi\fi

\KVO@setcurrentvalue Here the value part is parsed. Package keyval's \KV@@sp@def helps in removing spaces at the begin and end of the value.
\def\KVO@setcurrentvalue#1=#2@nil{\KV@@sp@def\CurrentOptionValue{#2}\

6.6 plain TpX

Disable \LaTeX\ stuff.
\begingroup\expandafter\expandafter\expandafter\endgroup\expandafter\ifx\csname documentclass\endcsname\relax\def\ProcessKeyvalOptions{\@ifstar\@gobble\fi\kv@AtEnd}{\@nameuse{KVO@process@keyval}\@currname.@\@currext}\fi\fi\fi\fi\fi\fi\fi\fi
6.7 Package \texttt{kvoptions-patch}

\begin{verbatim}
\NeedsTeXFormat{LaTeX2e}
\begingroup\catcode61\catcode48\catcode32=10\relax%
\catcode13=5 % ^^M
\endlinechar=13 %
\catcode123=1 % {
\catcode125=2 % }
\catcode64=11 % @
\def\x{\endgroup
\expandafter\edef\csname KVO@AtEnd\endcsname{%
\endlinechar=\the\endlinechar\relax
\catcode13=\the\catcode13\relax
\catcode32=\the\catcode32\relax
\catcode35=\the\catcode35\relax
\catcode61=\the\catcode61\relax
\catcode64=\the\catcode64\relax
\catcode123=\the\catcode123\relax
\catcode125=\the\catcode125\relax
}%
}\x\catcode61\catcode48\catcode32=10\relax%
\catcode13=5 % ^^M
\endlinechar=13 %
\catcode35=6 % #
\catcode64=11 % @
\catcode123=1 % {
\catcode125=2 % }
\def\TMP@EnsureCode#1#2{%
\edef\KVO@AtEnd{%
\KVO@AtEnd\catcode#1=\the\catcode#1\relax
}%
\catcode#1=#2\relax}
\TMP@EnsureCode{39}{12}% ' 
\TMP@EnsureCode{40}{12}% ( 
\TMP@EnsureCode{41}{12}% ) 
\TMP@EnsureCode{43}{12}% + 
\TMP@EnsureCode{44}{12}% , 
\TMP@EnsureCode{45}{12}% - 
\TMP@EnsureCode{46}{12}% . 
\TMP@EnsureCode{47}{12}% / 
\TMP@EnsureCode{58}{12}% : 
\TMP@EnsureCode{60}{12}% < 
\TMP@EnsureCode{62}{12}% > 
\TMP@EnsureCode{91}{12}% [ 
\TMP@EnsureCode{93}{12}% ] 
\TMP@EnsureCode{96}{12}% \ 
\TMP@EnsureCode{124}{12}% ] 
\edef\KVO@AtEnd{\KVO@AtEnd\noexpand\endinput}
\ProvidesPackage{kvoptions-patch}
[2016/05/16 v3.12 LaTeX patch for keyval options (HO)]%
\end{verbatim}

Check for \texttt{\textasciitilde\TeX}.

\begin{verbatim}
\begingroup\expandafter\expandafter\expandafter\endgroup
\expandafter{\ifx\csname e\TeXversion\endcsname\relax
\PackageWarningNoLine{kvoptions-patch}{%
\PackageLoadingIsAborted, because e-\TeX\ is missing%
}%
\expandafter\KVO@AtEnd
\fi
\end{verbatim}
Package \texttt{etexcmds} for \texttt{\textbackslash etex@unexpanded}. \hfill \texttt{\textbackslash RequirePackage{etexcmds}[2007/09/09]} \hfill \texttt{\textbackslash ifetex@unexpanded} \hfill \texttt{else} \hfill \texttt{PackageError{kvoptions-patch}{\%} \hfill \texttt{Could not find e\TeX's \string\unexpanded.\MessageBreak} \hfill \texttt{Try adding \string\RequirePackage\string{etexcmds}\string{\%} before \string\documentclass}\hfill \texttt{}} \hfill \texttt{\textbackslash ehd} \hfill \texttt{\expandafter\KVO@AtEnd} \hfill \texttt{fi\%} \hfill \texttt{Check for package \texttt{xkvltxp}.} \hfill \texttt{\@ifpackageloaded{xkvltxp}{\%} \hfill \texttt{Option `patch' cannot be used together with\MessageBreak} \hfill \texttt{package `xkvltxp' that is already loaded.\MessageBreak} \hfill \texttt{Therefore package loading is aborted\%} \hfill \texttt{}} \hfill \texttt{\KVO@AtEnd} \hfill \texttt{\{\%} \hfill \texttt{\def\ATE{options\#1\#2\#3\{\%} \hfill \texttt{\begingroup} \hfill \texttt{\KVO@normalize\KVO@temp\{\#3\%} \hfill \texttt{\edef\x{\endgroup\noexpand\@if@ptions{\%} \hfill \texttt{\detokenize\expandafter{\csname opt@#2.#1\endcsname\%} \hfill \texttt{}}{\%} \hfill \texttt{\expandafter\gdef\csname opt@#3.#1\expandafter\expandafter\expandafter\endcsname\expandafter{\%} \hfill \texttt{\KVO@temp\%} \hfill \texttt{\x\%} \hfill \texttt{\}}} \hfill \texttt{\}} \hfill \texttt{\def\AP{options\#1\#2\#3\{\%} \hfill \texttt{\begingroup} \hfill \texttt{\KVO@normalize\KVO@temp\{\#2\%} \hfill \texttt{\edef\x{\endgroup\noexpand\@if@ptions\{\%} \hfill \texttt{\detokenize\expandafter{\csname opt@#3.#1\endcsname\expandafter{\%} \hfill \texttt{\expandafter\gdef\csname opt@#3.#1\expandafter\expandafter\expandafter{\endcsname\expandafter{\%} \hfill \texttt{\KVO@temp\%} \hfill \texttt{\}}} \hfill \texttt{\expandafter\gdef\csname opt@#3.#1\expandafter\expandafter\expandafter{\endcsname\expandafter{\%} \hfill \texttt{\KVO@temp\%} \hfill \texttt{\}}} \hfill \texttt{\expandafter\gdef\csname opt@#3.#1\expandafter\expandafter\expandafter{\endcsname\expandafter{\%} \hfill \texttt{\KVO@temp\%} \hfill \texttt{\}}} \hfill \texttt{\expandafter\gdef\csname opt@#3.#1\expandafter\expandafter\expandafter{\endcsname\expandafter{\%} \hfill \texttt{\KVO@temp\%} \hfill \texttt{\}}} \hfill \texttt{\expandafter\gdef\csname opt@#3.#1\expandafter\expandafter\expandafter{\endcsname\expandafter{\%} \hfill \texttt{\KVO@temp\%} \hfill \texttt{\}}} \hfill \texttt{\expandafter\gdef\csname opt@#3.#1\expandafter\expandafter\expandafter{\endcsname\expandafter{\%} \hfill \texttt{\KVO@temp\%} \hfill \texttt{\}}} \hfill \texttt{\expandafter\gdef\csname opt@#3.#1\expandafter\expandafter\expandafter{\endcsname\expandafter{\%} \hfill \texttt{\KVO@temp\%} \hfill \texttt{\}}}
\def\KVO@process@ptions{%
\ifx\CurrentOption\@empty
\else
\begingroup
\ifx\@currext\@clsextension
\toks@{}%
\else
\KVO@GetClassOptionsList
\toks@{\expandafter{\KVO@classoptionslist,}}%
\toks@{\expandafter{\@curroptions}}%
\edef\x{\endgroup}
\x
\ifin@
\KVO@use@ption
\expandafter\let\csname ds@\CurrentOption\endcsname\@empty
\fi
\fi
\fi
\fi
\KVO@process@ptions
}\fi
\begingroup
\@for\CurrentOption:=\@declaredoptions\do{%
\ifx\CurrentOption\@empty
\else
\KVO@GetClassOptionsList
\@for\CurrentOption:=\KVO@classoptionslist\do{%
\ifx\CurrentOption\@empty
\else
\KVO@in@\CurrentOption\@declaredoptions
\ifin@
\KVO@use@ption
\expandafter\let\csname ds@\CurrentOption\endcsname\@empty
\fi
\fi
\fi
\fi
\KVO@process@ptions
}\fi
\@for\CurrentOption:=\@curroptions\do{%
\@ifundefined{ds@\KVO@SanitizedCurrentOption}{\KVO@use@ption}{%
\edef\x{\endgroup}
\x
\ifin@
\noexpand\in@true
\fi
\fi
\KVO@process@ptions
}\fi
\fi
\def\KVO@in@#1#2{%
\in@false
\begingroup
\@for\x:=#2\do{%
\ifx\x#1\relax
\in@true
\fi
}\edef\x{\endgroup}
\ifin@
\noexpand\in@true
\fi
\}%
\KVO@process@ptions
}%
\def\KVO@process@ptions{%
\@for\CurrentOption:=\@curroptions\do{%
\@ifundefined{ds@\KVO@SanitizedCurrentOption}{\KVO@use@ption}{%
\edef\x{\endgroup}
\x
\ifin@
\noexpand\in@true
\fi
\fi
\KVO@process@ptions
}%

Variant of \ExecuteOptions that better protects \CurrentOption.

\def\CurrentOption@SaveLevel{0}
\def\ExecuteOptions{\expandafter\KVO@ExecuteOptions\csname CurrentOption@CurrentOption@SaveLevel@endcsname}
\def\KVO@ExecuteOptions#1#2{\let#1\CurrentOption\edef\CurrentOption@SaveLevel{\the\numexpr\CurrentOption@SaveLevel+1\relax}%
@for\CurrentOption:=#2\do{\csname ds@\CurrentOption@endcsname}
\edef\CurrentOption@SaveLevel{\the\numexpr\CurrentOption@SaveLevel-1\relax}%
\let\CurrentOption#1%}
def\KVO@fileswith@pti@ns#1[#2]#3[#4]{\ifx#1\@clsextension
\ifx\@classoptionslist\relax
\KVO@normalize\KVO@temp{#2}\expandafter\gdef\expandafter\@classoptionslist\expandafter{\KVO@temp}%
def\reserved@a{\else
\detokenize\expandafter{\@unusedoptionlist,}%\fi
\detokenize\expandafter{\CurrentOption}%\fi
\fi
\fi}
Adding the global options:\MessageBreak
\space\space\x,\y\MessageBreak
to your \noexpand\documentclass declaration may fix this.%
\MessageBreak
Try typing \space <return> \space to proceed %
\MessageBreak
\endgroup
\space
\@pass@ptions\@currext{#2}{#1}%
\global\expandafter
\let\csname ver@\@currname.\@currext\endcsname\@empty
\InputIfFileExists
{\@currname.\@currext}{}
{\@missingfileerror\@currname\@currext}%
\let\@unprocessedoptions\@@unprocessedoptions
\csname\@currname.\@currext-h@@k\endcsname
\expandafter\let\csname\@currname.\@currext-h@@k\endcsname\@undefined
\@ifl@ter\@currext{#1}{#3}{}%\MessageBreak
\ifx\@currext\@clsextension\let\LoadClass\@twoloadclasserror\fi
\@popfilename
\@reset@ptions\reserved@a
\def\@unknownoptionerror{%
\@latex@error{Unknown option `\KVO@SanitizedCurrentOption' for \@cls@pkg\space `\@currname', perhaps you\MessageBreak
misspelled its name. %
Try typing \space <return> \space to proceed. %
\MessageBreak
\def\@unprocessedoptions{%
\ifx\@currext\@pkgextension\@undefined\@for\CurrentOption:=\@curroptions\do{\MessageBreak
\ifx\CurrentOption\@empty\else\@unknownoptionerror\fi\MessageBreak
\@latex@warning@no@line{You have requested,\on@line, version\MessageBreak
#3' of \@cls@pkg\space #1,\MessageBreak
but only version \csname ver@#1.\@currext\endcsname' is available%}
\@latex@warning@no@line{The option \KVO@SanitizedCurrentOption' was not declared in %\@cls@pkg\space `\@currname', perhaps you\MessageBreak
misspelled its name. %
Try typing \space <return> \space to proceed. %
}\MessageBreak
\@for\CurrentOption:=\@curroptions\do{\MessageBreak
\ifx\CurrentOption\@empty\else\@unknownoptionerror\fi\MessageBreak
\@latex@error{Unknown option `\KVO@SanitizedCurrentOption' for \@cls@pkg\space `\@currname',%
\def\KVO@SanitizedCurrentOption{%
\expandafter\strip@prefix\meaning\CurrentOption
}

Normalize option list.
\def\KVO@normalize#1#2{%\let\KVO@result\@empty
\KVO@splitcomma#2,\@nil\let#1\KVO@result\}
\def\KVO@splitcomma#1,#2\@nil{%\KVO@ifempty{#1}{}{%\KVO@checkkv#1=\@nil}%
\KVO@ifempty{#2}{}{\KVO@splitcomma#2\@nil}%
}\def\KVO@ifempty#1{%\expandafter\ifx\expandafter\\detokenize{#1}\%
\expandafter\@firstoftwo\else\expandafter\@secondoftwo\fi\}
\def\KVO@checkkv#1=#2\@nil{%\KVO@ifempty{#2}{%\% option without value
\edef\KVO@x{\zap@space#1 \@empty}%
\ifx\KVO@x\@empty%\% ignore empty option
\else\% append to list
\edef\KVO@result{\etex@unexpanded\expandafter{\KVO@result},\KVO@x
\}%\fi\}
\futurelet\@let@token\KVO@checkfirsttok\@nil| = \@nil|\KVO@nil
\}%\fi{%\def\KVO@checkfirsttok{\%\% #1: "key", #2: "value=
\% add key part
\edef\KVO@result{%\etex@unexpanded\expandafter{\KVO@result},%\KVO@x
\}%\fi{%\def\KVO@checkfirstA%\% no space at start
\expandafter\KVO@removelastspace\expandafter=%\% "<value><spaceopt>=" \@nil"
\else\% else
\expandafter\KVO@checkfirstA\fi}
\fi{%\def\KVO@checkfirstA#1 \@nil{\%\}%\fi
\KVO@removelastspace{} = \@nil | \#2 | \KVO@nil{\%}
\KVO@isempty{\#2}{\%}
\edef\KVO@result{\%}
\etex@unexpanded\expandafter{\KVO@result}{\%}
\etex@unexpanded\expandafter{\KVO@removegarbage\#1 | \KVO@nil}{\%}
\} \% \%
\edef\KVO@result{\%}
\etex@unexpanded\expandafter{\KVO@result}{\%}
\etex@unexpanded{\#1}{\%} \%
\} \%
\def\KVO@removegarbage\#1 = \@nil \#2 | \KVO@nil{\%}
\def\KVO@removeelement\#1 \#2 {\%}
\begingroup \toks@ = {} \%
\@for\x := \#2 \do{ \%
\ifx \x \@empty \else \ifx \x \#1 \relax \else \edef \t { \the \toks@ } \%
\ifx \t \@empty \else \toks@ \expandafter { \the \expandafter \toks@ \x } \%
\fi \fi \fi \fi \)
\edef \x \endgroup \def \noexpand \#2 { \the \toks@ } \%
\x \%
\} \%
\edef \x \{ \endgroup \%
\def \noexpand \#2 { \the \toks@ } \%
\} \%
\x \%
\} \%
\edef \x \{ \endgroup
\def \noexpand \#2 { \the \toks@ } \%
\} \%
\x \%
\} \%
\let \@@fileswith@pt@ns \KVO@fileswith@pt@ns
\ifx \@fileswith@pt@ns \@badrequireerror \else \let \@fileswith@pt@ns \KVO@fileswith@pt@ns \fi
\KVO@Patch \KVO@Patch = Y
\KVO@AtEnd{%}
{/patch}

7 Test

7.1 Preface for standard catcode check

(*test1)
\input miniltx.tex\relax
{/test1}
7.2 Catcode checks for loading

\catcode`\{=1 \%
\catcode`\}=2 \%
\catcode`#=6 \%
\catcode`@=11 \%
\expandafter\ifx\csname count@\endcsname\relax
\countdef\count@=255 \%
\fi
\expandafter\ifx\csname @gobble\endcsname\relax
\long\def\@gobble#1{}\%
\fi
\expandafter\ifx\csname @firstofone\endcsname\relax
\long\def\@firstofone#1{#1}\%
\fi
\expandafter\ifx\csname loop\endcsname\relax
\else
\expandafter\@gobble
\fi
{\
\def\loop#1\repeat{\
\def\body{#1}\
\iterate
}\def\iterate{\
\body
\let\next\iterate
\else
\let\next\relax
\fi
\next
\}
\let\repeat=\fi
\def\RestoreCatcodes{}
\count@=0 \%
\loop
\edef\RestoreCatcodes{\RestoreCatcodes\catcode\the\count@=\the\catcode\count@\relax}
\ifnum\count@<255 \%
\advance\count@ 1 \%
\repeat
\def\RangeCatcodeInvalid#1#2{\
\count@=#1\relax
\loop
\catcode\count@=15 \%
\ifnum\count@<#2\relax
\advance\count@ 1 \%
\repeat
\def\RangeCatcodeCheck#1#2#3{\
\count@=#1\relax
\loop
\ifnum#3=\catcode\count@ \else
\errmessage{Character \the\count@ with wrong catcode \the\catcode\count@ space
\}}}
instead of \number\textbf{#3}
\)
\fi
\ifnum\count@<#2\relax
\advance\count@ 1 \%
\repeat
\def\space{ }
\expandafter\ifx\csname LoadCommand\endcsname\relax
\def\LoadCommand{\input kvoptions.sty\relax}\fi
\def\Test{\RangeCatcodeInvalid{0}{47}\%
\RangeCatcodeInvalid{58}{64}\%
\RangeCatcodeInvalid{91}{96}\%
\RangeCatcodeInvalid{123}{255}\%
\catcode`\@=12 \%
\catcode`\=0 \%
\catcode`%=14 \%
\LoadCommand
\RangeCatcodeCheck{0}{36}{15}\%
\RangeCatcodeCheck{37}{37}{14}\%
\RangeCatcodeCheck{38}{47}{15}\%
\RangeCatcodeCheck{48}{57}{12}\%
\RangeCatcodeCheck{58}{63}{15}\%
\RangeCatcodeCheck{64}{64}{12}\%
\RangeCatcodeCheck{65}{90}{11}\%
\RangeCatcodeCheck{91}{91}{15}\%
\RangeCatcodeCheck{92}{92}{0}\%
\RangeCatcodeCheck{93}{96}{15}\%
\RangeCatcodeCheck{97}{122}{11}\%
\RangeCatcodeCheck{123}{255}{15}\%
\RestoreCatcodes
\}
\Test
\csname @@end\endcsname
\end
⟨/test1⟩
⟨*test2⟩
\NeedsTeXFormat{LaTeX2e}
\makeatletter
\catcode`\@=11 \%
\def\RestoreCatcodes{}
\count@=0 \%
\loop
\edef\RestoreCatcodes{%
\RestoreCatcodes
\catcode\the\count@=\the\catcode\count@\relax
}\repeat
\ifnum\count@<255 \%
\advance\count@\@ne \ne
\repeat
\def\RangeCatcodeInvalid#1#2{%
\count@=#1\relax
\loop
\catcode\count@=15 \%
\ifnum\count@<#2\relax
\advance\count@\@ne \ne
\repeat
\def\Test#1{%
\RangeCatcodeInvalid{0}{47}\% 
\RangeCatcodeInvalid{58}{64}\% 
\RangeCatcodeInvalid{91}{96}\% 
\RangeCatcodeInvalid{123}{255}\% 
catcode \@=12 \% 
catcode \=0 \% 
catcode \{}=1 \% 
catcode \}=2 \% 
catcode \#=6 \% 
catcode \[=12 \% 
catcode \]=12 \% 
catcode \%=14 \% 
catcode \s=10 \% 
code13=5 \% 
#1\relax
\RestoreCatcodes
\Test{\RequirePackage{kvoptions-patch}}\% 
\Test{\RequirePackage{kvoptions}}\% 
\csname @@end\endcsname
⟨/test2⟩
(*test3)
\NeedsTeXFormat{LaTeX2e}
\makeatletter
\RequirePackage{kvoptions}[2016/05/16]
\def\msg#1{\immediate\write16{#1}}
\define@key{testfamily}{testkey}{\msg{[testfamily/testkey/#1]}}
\define@key{testfamily}{testdefaultkey}[testdefault]{\msg{[testfamily/testdefaultkey/#1]}}
\AddToKeyvalOption{testfamily}{testkey}{\msg{[addition/#1]}}
\AddToKeyvalOption{testfamily}{testdefaultkey}{\msg{[addition/#1]}}
\setkeys{testfamily}{testkey=testA, testdefaultkey=testB, testdefaultkey,}
\SetupKeyvalOptions{family=testfamily}
\AddToKeyvalOption*{testkey}{\msg{[star addition/#1]}}
\AddToKeyvalOption*{testdefaultkey}{\msg{[star addition/#1]}}
\setkeys{testfamily}{testkey=testA, testdefaultkey=testB, testdefaultkey,}
\@@end
⟨/test3⟩
(*test4pkg)
\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage{kvoptions-test4}[2016/05/16 package for testing]
\RequirePackage{kvoptions}[2016/05/16]
\SetupKeyvalOptions{%
  family=FOO,%
  prefix=foo,%
  setkeys=\kvsetkeys,%
}
\DeclareStringOption{str}
\define@key{FOO}{set}{%
  \setkeys{BAR}{strbar={#1}}%
}
\define@key{BAR}{strbar}{%
  \def\foostr{[BAR:#1]}%
}
\ProcessKeyvalOptions*
\NeedsTeXFormat{LaTeX2e}
\ProvidesFile{kvoptions-test4.tex}[2016/05/16 test file]
\RequirePackage[%
  str=A,set=B,str=C,%
]{kvoptions-test4}[2016/05/16]
\def\TestExpected{C}
\ifx\foostr\TestExpected
  \typeout{* Test ok.}%
\else
  \typeout{* Result: \[
  \foostr\]
  \typeout{* Expected: \[
  \TestExpected\]}%
  \errmessage{Test failed!}%
\fi
\csname @@end\endcsname\end

8 Installation

8.1 Download

Package. This package is available on CTAN:\footnote{\url{http://ctan.org/pkg/kvoptions}}:

\texttt{CTAN:macros/latex/contrib/oberdiek/kvoptions.dtx} The source file.

Bundle. All the packages of the bundle ‘oberdiek’ are also available in a TDS compliant ZIP archive. There the packages are already unpacked and the documentation files are generated. The files and directories obey the TDS standard.

\texttt{CTAN:install/macos/latex/contrib/oberdiek.tds.zip}

\textit{TDS} refers to the standard “A Directory Structure for \TeX Files” (\texttt{CTAN:tds/tds.pdf}). Directories with \texttt{texmf} in their name are usually organized this way.

8.2 Bundle installation

Unpacking. Unpack the \texttt{oberdiek.tds.zip} in the TDS tree (also known as \texttt{texmf} tree) of your choice. Example (linux):

\begin{verbatim}
    unzip oberdiek.tds.zip -d -/texmf
\end{verbatim}
Script installation. Check the directory TDS:scripts/oberdiek/ for scripts that need further installation steps. Package attachfile2 comes with the Perl script pdfatfi.pl that should be installed in such a way that it can be called as `pdfatfi`. Example (linux):

```bash
chmod +x scripts/oberdiek/pdfatfi.pl
cp scripts/oberdiek/pdfatfi.pl /usr/local/bin/
```

8.3 Package installation

Unpacking. The `.dtx` file is a self-extracting docstrip archive. The files are extracted by running the `.dtx` through plain TeX:

```latex
tex kvoptions.dtx
```

TDS. Now the different files must be moved into the different directories in your installation TDS tree (also known as `texmf` tree):

```plaintext
kvoptions.sty → tex/latex/oberdiek/kvoptions.sty
kvoptions-patch.sty → tex/latex/oberdiek/kvoptions-patch.sty
kvoptions.pdf → doc/latex/oberdiek/kvoptions.pdf
dexample-mycolorsetup.sty → doc/latex/oberdiek/example-mycolorsetup.sty
test/kvoptions-test1.tex → doc/latex/oberdiek/test/kvoptions-test1.tex
test/kvoptions-test2.tex → doc/latex/oberdiek/test/kvoptions-test2.tex
test/kvoptions-test3.tex → doc/latex/oberdiek/test/kvoptions-test3.tex
test/kvoptions-test5.tex → doc/latex/oberdiek/test/kvoptions-test5.tex
test/kvoptions-test4.sty → doc/latex/oberdiek/test/kvoptions-test4.sty
kvoptions.dtx → source/latex/oberdiek/kvoptions.dtx
```

If you have a `docstrip.cfg` that configures and enables docstrip’s TDS installing feature, then some files can already be in the right place, see the documentation of docstrip.

8.4 Refresh file name databases

If your TeX distribution (t经济技术, mikTeX, ...) relies on file name databases, you must refresh these. For example, tec TikZ users run `texhash` or `mktexlsr`.

8.5 Some details for the interested

Unpacking with LaTeX. The `.dtx` chooses its action depending on the format:

plain TeX: Run docstrip and extract the files.

LaTeX: Generate the documentation.

If you insist on using LaTeX for docstrip (really, docstrip does not need LaTeX), then inform the autodetect routine about your intention:

```latex
\let\install=y\input{kvoptions.dtx}
```

Do not forget to quote the argument according to the demands of your shell.

Generating the documentation. You can use both the `.dtx` or the `.drv` to generate the documentation. The process can be configured by the configuration file `ltxdoc.cfg`. For instance, put this line into this file, if you want to have A4 as paper format:

```latex
\PassOptionsToClass{a4paper}{article}
```

An example follows how to generate the documentation with pdfLaTeX:
9 Catalogue

The following XML file can be used as source for the TeX Catalogue. The elements caption and description are imported from the original XML file from the Catalogue. The name of the XML file in the Catalogue is kvoptions.xml.

```xml
<entry datestamp='$Date$' modifier='$Author$' id='kvoptions'>
  <name>kvoptions</name>
  <caption>Key value format for package options.</caption>
  <authorref id='auth:oberdiek'/>
  <license type='lppl1.3'/>
  <version number='3.12'/>
  <description>
    This package offers support for package authors who want to use options in key-value format for their package options.
  </description>
  <documentation details='Package documentation' href='ctan:/macros/latex/contrib/oberdiek/kvoptions.pdf'/>
  <ctan file='true' path='/macros/latex/contrib/oberdiek/kvoptions.dtx'/>
  <miktex location='oberdiek'/>
  <texlive location='oberdiek'/>
  <install path='/macros/latex/contrib/oberdiek/oberdiek.tds.zip'/>
</entry>
```

10 References


11 History

[0000/00/00 v0.0]

• Probably David Carlisle’s code in hyperref was the start.

[2004/02/22 v1.0]

• The first version was never published. It also has offered a patch to get rid of \LaTeX’s option expansion.

[2006/02/16 v2.0]

• Now the package is redesigned with an easier user interface.

• \texttt{\ProcessKeyvalOptions} remains the central service, inherited from hyperref’s \texttt{\ProcessOptionsWithKV}. Now the use inside classes is also supported.

• Provides help macros for boolean and simple string options.

• Fixes for the patch of \LaTeX. The patch is only enabled, if the user requests it.

[2006/02/20 v2.1]

• Unused option list is sanitized to prevent problems with other packages that uses own processing methods for key value options. Disadvantage: the unused global option detection is weakened.

• New option type by \texttt{\DeclareVoidOption} for options without value.

• Default rule by \texttt{\DeclareDefaultOption}.

• Dynamic options: \texttt{\DisableKeyvalOption}.

[2006/06/01 v2.2]

• Fixes for option patch.

[2006/08/17 v2.3]

• \texttt{\DeclareBooleanOption} renamed to \texttt{\DeclareBoolOption} to avoid a name clash with package \texttt{\ifoption}.

[2006/08/22 v2.4]

• Option patch: \texttt{\ExecuteOptions} does not change the meaning of macro \texttt{\CurrentOption} at all.
[2007/04/11 v2.5]
  • Line ends sanitized.

[2007/05/06 v2.6]
  • Uses package etexcmds.

[2007/06/11 v2.7]
  • The patch part fixes LaTeX bug latex/3965.

[2007/10/02 v2.8]
  • Compatibility for plain TeX added.
  • Typos in documentation fixed (Axel Sommerfeldt).

[2007/10/11 v2.9]
  • Bug fix for option patch.

[2007/10/18 v3.0]
  • New package kvoptions-patch.

[2009/04/10 v3.1]
  • Space by line end removed in definition of internal macro.

[2009/07/17 v3.2]
  • \ProcessLocalKeyvalOptions added.
  • \DisableKeyvalOption with the action=ignore option fixed (Joseph Wright).

[2009/07/21 v3.3]
  • \DeclareLocalOption, \DeclareLocalOptions added.

[2009/08/13 v3.4]
  • Documentation addition: recommendation for Joseph Wright’s review article.
  • Documentation addition: local/global options.

[2009/12/04 v3.5]
  • \AddToKeyvalOption added.

[2009/12/08 v3.6]
  • Fix: If a default handler is configured, it is now also called for classes.

[2010/02/22 v3.7]
  • Missing space in error message added.
[2010/07/23 v3.8]
  • Documentation for package \texttt{kvoptions-patch} improved. No code changes.

[2010/12/02 v3.9]
  • Key \texttt{setkeys} added for \texttt{\SetupKeyvalOptions}.

[2010/12/23 v3.10]
  • \texttt{\textbackslash DeclareVoidOption} also parses the second parameter as \LaTeX\ argument to improve compatibility with \texttt{\textbackslash DeclareOption}.

[2011/06/30 v3.11]
  • Fix because of design bug in package \texttt{xkeyval} that removes global options with equal signs.

[2016/05/16 v3.12]
  • Documentation updates.

12 Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; plain numbers refer to the code lines where the entry is used.

Symbols

\# ........................................ 1371, 1409
\% ........................................ 1447, 1502
\@ ........................................ 1372, 1445, 1470, 1495
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