key-theorems package

version $0.0.2\gamma$

github.com/mbertucci47/key-theorems

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Abstract

An expl3-implementation of a key-value interface to amsthm, implementing most of the functionality provided by thmtools. Very much not a finished product. Don't use it for anything important!

1 Load-time Options

overload (initially unset)

Redefines \newtheorem to internally use the key-theorems machinery. The syntax remains the same.

thmtools-compat (initially unset)

For compatibility with thmtools syntax. Currently defines the \declaretheoremstyle, \declaretheorem, and \listoftheorems commands and the restatable environment.

store-all (initially unset)

Tells key-theorems to grab the body of each theorem so it can later be printed with \listofkeytheorems[print-body] Note that this means a theorem body *cannot* contain verbatim material.

2 Global Options

 $\keytheoremset{\langle options \rangle}$

```
restate-counters=\{\langle comma-list\ of\ counters \rangle\}
```

(initially {equation})

Additional counters whose values are preserved when a theorem is restated. This key does not reset the list, so you don't need to include equation in $\langle comma-list \rangle$.

```
continues-code=\langle code \ with \ #1 \rangle
```

(initially continuing from p.\,\pageref{#1})

The code used to typeset the note produced by the continues P. 2 kev.

```
{\tt qed-symbol=} \langle symbol \rangle
```

(initially \openbox)

Redefines \qed{symbol} to be $\langle symbol \rangle$.

3 Declaring Theorems

 $\new keytheorem {\langle env \ name \rangle} [\langle options \rangle]$

Defines a theorem environment $\langle env \; name \rangle$ which itself takes a few options (see subsection 3.1). You can also declare multiple theorems at once by replacing $\langle env \; name \rangle$ with a comma-list of names, e.g. $\mbox{newkeytheorem{theorem,lemma,proposition}[\langle options \rangle]}$.

By default, the theorem's printed name is a title-cased $\langle env \ name \rangle$. This can be changed with the name $^{\rightarrow P.3}$ key. All $\langle options \rangle$ are described in subsections 3.2 and 3.3.

<pre>% preamble \newkeytheorem{theorem}</pre>	
<pre>% document \begin{theorem} Some text \end{theorem}</pre>	Theorem 1. Some text

3.1 Keys available to theorem environments

As in amsthm, theorems can take an optional argument that contains a note or heading.

```
\begin{theorem}[some heading]
Some text
\end{theorem}
Theorem 2 (some heading). Some text
```

Alternatively, the optional argument may contain any of the following keys.

 $note=\langle text \rangle$ (initially unset)

Alias name. This is the key-value equivalent of the optional argument described above. This syntax, however, allows the argument to contain other keys.

```
\begin{theorem} [some heading]
Some text
\end{theorem}
\begin{theorem} [note=another heading]
Some more text
\end{theorem}
Theorem 3 (some heading). Some text

Theorem 4 (another heading). Some
more text
\end{theorem}
```

 $label = \langle label \ name \rangle$ (initially unset)

This is the key-value equivalent of $\lceil \frac{label \ name}{label}$.

```
\begin{theorem}[label=foo]
Some text
\end{theorem}
\ref{foo}
Theorem 5. Some text

5
```

 $continues*=\langle label\ name \rangle$

(initially unset)

Pick up a theorem where you left off. The theorem number remains the same. The printed text can be customized with the continues-code option. The starred version also copies the theorem note, if it exists.

```
\begin{theorem} [continues=foo] \dots and some more text. \end{theorem}

Theorem 5 (continuing from p. 2). ... and some more text.
```

 $store=\langle csname \rangle$ (initially unset)

Alias restate. Defines a command $\c csname$ that can be used to restate the theorem, including the body text, later in the document. This is the local version of the store-all-P.1 load-time option. A theorem given this key *cannot* contain verbatim material.

\begin{theorem} [store=blub] Theorem 6. A theorem worth restating.
A theorem worth restating.
\end{theorem} More brilliant mathematics.
\blub
Theorem 6. A theorem worth restating.

Theorem 6. A theorem worth restating.

3.2 Keys inherited from thmtools

These are the $[\langle options \rangle]$ passed to \newkeytheorem. For more description, see the thmtools package.

 $name = \langle display \ name \rangle$

(initially title-cased $\langle env \ name \rangle$)

Aliases title and heading.

```
% preamble
\newkeytheorem{mythm}[name=Some Name]

% document
\begin{mythm}
Some text
\end{mythm}
Some 1. Some text
```

numbered=true|false

(default true, initially true)

For compatibility with thmtools, also accepts the values yes and no.

```
% preamble
\newkeytheorem{theorem*}[
  name=Theorem, numbered=false
  ]

Theorem. An unnumbered theorem.

% document
\begin{theorem*}
An unnumbered theorem.
\end{theorem*}
```

 $parent=\langle counter \rangle$

(initially unset)

Aliases number within and within.

```
% preamble
\newkeytheorem{conjecture}[parent=section]

% document
\begin{conjecture}
The first number is the section.
\end{conjecture}
Conjecture 3.1. The first number is the section.
```

 $sibling=\langle counter \rangle$

(initially unset)

Aliases numberlike and sharenumber.

```
% preamble
\newkeytheorem{lemma}[sibling=theorem]

% document
\begin{lemma}
This shares its counter with
\texttt{theorem}.
\end{lemma}
Lemma 7. This shares its counter with
theorem.
```

 $style=\langle style \ name \rangle$

(initially unset)

Accepts any $\langle style \ name \rangle$ defined by $\ensuremath{\text{Newkeytheoremstyle}}^{\to P.5}$, as well as any of the predefined amsthm styles: plain, definition, and remark.

```
% preamble
         \newkeytheorem{remark}[style=remark]
        % document
                                                                Remark 1. Some text
        \begin{remark}
        Some text
         \end{remark}
                                                                                                  (initially unset)
preheadhook = \langle code \rangle
postheadhook = \langle code \rangle
                                                                                                  (initially unset)
prefoothook = \langle code \rangle
                                                                                                   (initially unset)
postfoothook = \langle code \rangle
                                                                                                   (initially unset)
     Details in section 6.
         % preamble
         \newkeytheorem{test}[
           preheadhook=PREHEAD,
           postheadhook=POSTHEAD,
                                                                PREHEAD
           prefoothook=PREFOOT,
           postfoothook=POSTFOOT
                                                                Test 1. POSTHEADSome text PREFOOT
                                                                POSTFOOT
        % document
        \begin{test}
        Some text
         \end{test}
refname=\langle refname \rangle or \{\langle singular\ name \rangle, \langle plural\ name \rangle\}
                                                                                       (initially \langle display \ name \rangle)
     If a single string, then the name used by hyperref's \autoref and cleveref's \cref. If two strings
     separated by a comma, then the second string is the plural form used by \cref.
Refname=\langle ref \ name \rangle or \{\langle singular \ name \rangle, \langle plural \ name \rangle\}
                                                                                        (initially \langle display \ name \rangle)
     Same as refname but for \Autoref and \Cref.
         % preamble
         \newkeytheorem{prop}[
           name=Proposition,
           refname={proposition,propositions},
           Refname={Proposition,Propositions}
                                                                Proposition 1. Some text
         % document
```

```
% preamble
\newkeytheorem{prop}[
name=Proposition,
refname={proposition,propositions},
Refname={Proposition,Propositions}
]

% document
\begin{prop}[label=abc]
Some text
\end{prop}
\begin{prop}[label=def]
Some more text
\end{prop}
\begin{theorem}
Consider \cref{abc,def}.
\Autoref{abc} \dots
\end{theorem}
Proposition 1. Some text

Proposition 2. Some more text

Theorem 8. Consider propositions 1
and 2. Proposition 1...
```

 $qed=\langle symbol \rangle$ (default \openbox, initially unset)

Adds $\langle symbol \rangle$ to the end of the theorem body. If no value is given, the symbol \square is used.

```
% preamble
\newkeytheorem{example}[qed]
\newkeytheorem{solution}[qed=$\clubsuit$]

% document
\begin{example}
Some text
\end{example}
\begin{solution}
Some more text
\end{solution}
Example 1. Some text

Solution 1. Some more text

$\delta$
$\de
```

3.3 Keys added by key-theorems

 $tcolorbox = \{\langle tcolorbox \ options \rangle\}$

(initially unset)

This key specifies that the theorem be placed inside a toolorbox environment with *(options)*.

```
% preamble
\tcbset{
  defstyle/.style={
    arc=0mm,
    colback=blue!5!white,
    colframe=blue!75!black
                                                  Corollary 1.
  }
\newkeytheorem{corollary}[tcolorbox]
                                                  Some text
\newkeytheorem{definition}[
  style=definition,
  tcolorbox={defstyle}
                                                  Definition 1.
                                                  Some more text
% document
\begin{corollary}
Some text
\end{corollary}
\begin{definition}
Some more text
\end{definition}
```

4 Theorem Styles

 $\verb|\newkeytheoremstyle|{\langle name \rangle}|{\langle options \rangle}|$

This is key-theorems' version of thmtools' \declaretheoremstyle [$\langle options \rangle$] { $\langle name \rangle$ }. Since it makes little sense to define a style with no keys, we've made the $\langle options \rangle$ argument mandatory.

4.1 Keys inherited from thmtools

The following keys have the same meaning and syntax as the corresponding thmtools keys.

```
 spaceabove = \langle length \rangle \qquad \qquad (initially \topsep) \\  spacebelow = \langle length \rangle \qquad \qquad (initially \topsep) \\  bodyfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headindent = \langle length \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declarations \rangle \qquad \qquad (initially \topsep) \\  headfont = \langle font \ declaratio
```

```
headpunct=\langle code \rangle (initially \{.\})

postheadspace=\langle length \rangle (initially 5pt plus 1pt minus 1pt)

Do not use this with the break key.

break (initially unset)

Do not use this with the postheadspace key.

notefont=\langle font declarations \rangle (initially \fontseries \mddefault \upshape)

notebraces=\langle \langle left brace \rangle \rangle \langle right brace \rangle \rangle (initially \langle (\rangle \langle \rangle \rangle) \rangle (initially \langle (\rangle \langle \rangle \rangl
```

headstyle=margin|swapnumber| $\langle code \ using \ \backslash NAME, \ \backslash NUMBER, \ and \ \backslash NOTE \rangle$

Alias headstyle. Within $\langle code \rangle$, the commands \NAME, \NUMBER, and \NOTE correspond to the formatted parts of the theorem head.

4.2 Keys added by key-theorems

```
inherit-style=\langle style \ name \rangle \qquad \qquad (initially \ unset)
```

Inherit the keys of any style declared with \newkeytheoremstyle \(^{-P.5}\). Additionally, the three styles predefined by amsthm are possible values: plain, definition, and remark.

5 Listing Theorems

 $\label{listofkeytheorems} [\langle options \rangle]$

 $\key theorem list set {\langle options \rangle}$

	List of Theorems	
\listofkeytheorems	1 Theorem 1 2 Theorem (some heading) 2 3 Theorem (some heading) 2 4 Theorem (another heading) 2 5 Theorem 2 5 Theorem (continuing from p. 2) 2 6 Theorem 3 Theorem 3 Theorem 3 Theorem 3 Theorem 3 Temma 3 Test 4 Proposition 4 Proposition 4 Example 4 Solution 4 Definition 5	

5.1 Keys inherited from thmtools

 $numwidth=\langle length\rangle$ (initially 2.3em)

```
ignore = \{\langle comma-list\ of\ env\ names \rangle\}  (initially unset) show = \{\langle comma-list\ of\ env\ names \rangle\}  (initially all theorems) onlynamed = \{\langle comma-list\ of\ env\ names \rangle\}  (initially unset) ignoreall
```

	List of Theorems
<pre>\listofkeytheorems[ignoreall,show=theorem] \listofkeytheorems[ignoreall, show=conjecture, title=List of Conjectures]</pre>	1 Theorem 1 2 Theorem (some heading) 2 3 Theorem (some heading) 2 4 Theorem (another heading) 2 5 Theorem 2 5 Theorem (continuing from p. 2) 2 6 Theorem 2 8 Theorem 4
	List of Conjectures
	3.1 Conjecture

showall (initially set) $title = \langle text \rangle$ (initially List of Theorems) swapnumber = true | false (initially false)

5.2 Keys added by key-theorems

title-code=(code with #1) (initially \section*{#1})

If \chapter is defined, then initially this is instead \chapter*{#1}.

no-title (initially unset)

Suppresses the title of the list of theorems. Useful for custom ordering of the list.

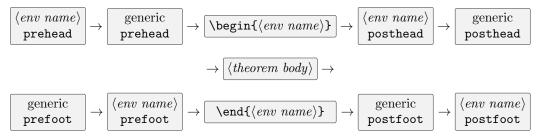
print-body (initially unset)

Instead of listing the theorem headings, the theorems are restated with their body text. Requires the store-all $^{\rightarrow P.1}$ load-time option to be useful.

6 Theorem Hooks

 $\addtotheoremhook[\langle env\ name \rangle] \{\langle hook\ name \rangle\} \{\langle code \rangle\}$

 $\langle hook\ name \rangle$ can be prehead, posthead, prefoot, or postfoot. If no $\langle env\ name \rangle$ is given, the $\langle code \rangle$ is added to the "generic" hook, i.e. applied to all theorems. As in thmtools, the order of hooks is as follows:



In thmtools, the prefoot and postfoot hooks always prepend code, i.e. the code

```
\verb| addtotheorempostfoothook{A}| \\ | addtotheorempostfoothook{B}| \\
```

results in BA after the theorem. With key-theorems, code is added in the order declared, meaning

results in AB after the theorem. This is the behavior of the LATEX kernel hooks that key-theorems uses under the hood.

Right now, code added using the hook keys preheadhook $^{\rightarrow P.4}$, etc. is outermost, meaning executed first in prehead and posthead and last in prefoot and postfoot. This may change if I think of good reasons to do so...

Index

_	_
\addtotheoremhook, 7	${\tt numberwithin},3$
\Autoref, 4	$\mathtt{numwidth},\ 6$
	onlynamed, 7
bodyfont key, 5	$\mathtt{overload},\ 1$
break key, 6	$\mathtt{parent},3$
	${\tt postfoothook},4$
Commands	${ t postheadhook},4$
\addtotheoremhook, 7	postheadspace, 6
$\Autoref, 4$	prefoothook, 4
$\delta = 1$	$\frac{1}{\text{preheadhook}}$, 4
\declaretheoremstyle, 1	print-body, 7
\keytheoremlistset, 6	qed,4
\keytheoremset, 1	qed-symbol, 1
\listofkeytheorems, 6	- · · · · · · · · · · · · · · · · · · ·
\listoftheorems, 1	Refname, 4
NAME, 6	refname, 4
	restate, 2
\newkeytheorem, 1	restate-counters, 1
\newkeytheoremstyle, 5	${\tt sharenumber},3$
NOTE, 6	${ t show},\ 7$
\NUMBER, 6	$\mathtt{showall},\ 7$
continues key, 2	${ t sibling},3$
continues-code key, 1	${ t spaceabove}, 5$
	spacebelow, 5
$\declaretheorem, 1$	store, 2
$\declaretheoremstyle, 1$	$\mathtt{store-all}, 1$
definition value, 3, 6	style, 3
	swapnumber, 7
Environments	tcolorbox, 5
${\tt restatable}, 1$	thmtools-compat, 1
headfont key, 5	title, 3, 7
headindent key, 5	title-code, 7
heading key, 3	within, 3
headpunct key, 6	\keytheoremlistset, 6
headstyle key, 6	\keytheoremset, 1
ignore key, 7	label key, 2
ignoreall key, 7	\listofkeytheorems, 6
inherit-style key, 6	$\$ listoftheorems, 1
imorio bojio koji, o	
Keys	margin value, 6
bodyfont, 5	\
break, 6	NAME, 6
continues, 2	name key, $2, 3$
•	$\new keytheorem, 1$
continues-code, 1	\newkeytheoremstyle, 5
headfont, 5	no-title $\mathrm{key},7$
headindent, 5	\NOTE, 6
heading, 3	note key, 2
headpunct, 6	notebraces key, 6
${\tt headstyle}, 6$	notefont key, 6
ignore, 7	\NUMBER, 6
ignoreall, 7	numbered key, 3
inherit-style, 6	numberlike key, 3
label, 2	numberwithin key, 3
$\mathtt{name},2,3$	numwidth key, 6
no-title, 7	namwiaon ney, o
note, 2	onlynamed key, 7
notebraces, 6	_
notefont, 6	overload key , 1
numbered, 3	parent key 2
numberled, 3	parent key, 3
	plain value, 3, 6

```
{\tt postfoothook}\ key,\ 4
{\tt postheadhook}\ key,\ 4
postheadspace key, 6
{\tt prefoothook}\ key,\ 4
preheadhook key, 4
print-body key, 7
\operatorname{\mathsf{qed}} \ker, 4
\operatorname{\tt qed\text{-}symbol}\ \operatorname{key},\ 1
{\tt Refname}\ key,\ 4
{\tt refname}\ key,\ 4
remark value, 3, 6
\verb"restatable" environment, 1
{\tt restate}\ {\rm key},\ 2
\verb"restate-counters" key, 1
\verb|sharenumber| key, 3
show key, 7
showall key, 7
\verb|sibling| key, 3
spaceabove key, 5
spacebelow key, 5
store key, 2
store-all key, 1
style key, 3
swapnumber key, 7
swapnumber value, 6
tcolorbox key, 5
thmtools-compat \ker, 1
title key, 3, 7
title-code key, 7
Values
      {\tt definition},\,3,\,6
     margin, 6
      plain, 3, 6
      remark, 3, 6
      swapnumber, 6
within key, 3
```