

macrolist – Create lists of macros and manipulate them

Dennis Chen
proofprogram@gmail.com

v1.0.1, 2021/07/16*

Abstract

The **macrolist** package allows you to create lists and manipulate them, with utilities such as `\listforeach` and an implementation of `arr.join()` from Javascript. Contrary to the name of the package, non-macros and groups of macros can be put into an item of the list.

1 Usage

The scope of lists is always global. This seems to provide the most

`\newlist` To create a list, pass in `\newlist{listname}` to create a list with the name `listname`.

The package checks that `listname` is not the name of another list, and will throw an error if another list `listname` has already been defined.

`\listelement` To execute the `i`th element of `listname`, write `\listelement{listname}{i}`. Note that *lists are 1-indexed*, meaning the first element is numbered 1, the second element numbered 2, and so on.

An error will be thrown if `listname` is not a defined list, if `i` is empty, or if `i` is greater than the size of the list.

`\listadd` To add something to the list `listname`, pass in `\listadd{listname}[position]{element}`, where `position` is an optional argument. If nothing is passed in for `position`, then by default `element` will be added to the end of the list.

`\listremove` To remove an element in a list, write `\listremove{listname}{index}`.

`\listremove` To remove the last element in a list, write `\listremove{listname}`. This behaves like C++'s `pop_back`.

`\listclear`

*<https://github.com/chennisden/macrolist>

	To clear a list, write <code>\listclear{listname}</code> .
<code>\listsize</code>	To get the size of a list, write <code>\listsize{listname}</code> .
<code>\listforeach</code>	To write a for each loop, write <code>\begin{listforeach}{listname}{\element}[begin][end]{action}</code>
	Note that <code>begin</code> and <code>end</code> are optional arguments, and by default, they take the values <code>1</code> and <code>\listsize{listname}</code> . If you pass in <code>begin</code> , you must also pass in <code>end</code> .
<code>\listjoin</code>	Executing <code>\listjoin{listname}{joiner}</code> returns all of the elements separated by <code>joiner</code> . This behaves like Javascript's <code>arr.join()</code> .

2 Example

Here is the source code for a small document using `macrolist`.

```

\documentclass{article}
\usepackage{macrolist}

\begin{document}

\newlist{mylist}
\listadd{mylist}{Some text}
% List: Some text

\newcommand\macro{This is a macro}

\listadd{mylist}{\macro}
% List: Some text, \macro

\listelement{mylist}{1}
% Prints out "Some text"

\listadd{mylist}[1]{Element inserted into beginning}
% List: Element inserted into beginning, Some text, \macro

\listremove{mylist}{1}
% List: Some text, \macro

\listforeach{mylist}{\element}{We're printing out \textbf{\element}. }
% We're printing out \textbf{Some text}. We're printing out \textbf{\macro}.

\listjoin{mylist}{, }
% Some text, \macro

```

`\end{document}`

3 Implementation details

All internal macros are namespaced to prevent package conflicts.

`\macrolist@exists` One internal macro we use is `\macrolist@exists{listname}`, which checks that `listname` exists. It throws an error otherwise.

```

1 \newcommand*{\macrolist@exists}[1]{%
2   \ifcsname c@macrolist@list@#1\endcsname
3   \else
4     \PackageError{macrolist}
5       {The first argument is not a defined list}
6       {Make sure you have defined the list before trying to operate on it.}
7   \fi
8 }
```

`\macrolist@inbounds` We use `\macrolist@inbounds{listname}{index}` to check that first, `listname` is a defined list using `\macrolist@exists`, and second, that `index` is within bounds. It throws an error otherwise.

```

9 \newcommand*{\macrolist@inbounds}[2]{%
10   \macrolist@exists{#1}%
11   %
12   \if\relax\detokenize{#2}
13     \PackageError{macrolist}
14       {No number has been passed into the second argument of your command
15       }{Pass in a number to the second argument of your command.}
16   \fi
17   %
18   \ifnum\numexpr#2 \relax>\listsize{#1}
19     \PackageError{macrolist}
20       {Index out of bounds}
21       {The number you have passed in to the second argument of your command\MessageBreak
22       is out of the bounds of list '#1'.}
23   \fi
24 }
```

Change History

v1.0.0	changes entry 1
General: Initial version 1	
v1.0.1	Fix v. appearing in front of date in document title 1
General: Add “scope is always global” to documentation 1	
Fix date in initial version	Make a couple of defs and lets global to prevent scoping issues 1

v1.0.2	in listforeach	1
General: Added comment markers to remove pars and fix spacing	Print changelog in documentation	1