The refcard class

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1 Introduction

According to Wikipedia, a cheat sheet is a concise set of notes used for quick reference. Some might even call it a reference sheet, hence the name. In lieu of a proper documentation, we provide herewith a reference sheet for the document class `refcard`.

This small class is aimed to make the typesetting of reference sheets a bit less tedious, so you can focus on using them. The class is inspired from the question and answer Document Class for Reference Cards.

Since `refcard` is based on `article` most options can be passed on (see further below).

2 Usage

After you have obtained and installed the class file you can load the class directly:

```
\documentclass{refcard}
[...]
\begin{document}
[...]
\end{document}
```

2.1 Class Option and disabled options

There are currently two options provided for this class:

Key [class] `columns` The columns option specifies the number of columns which sshall be used. For this purpose the `multicol` package is loaded, and the begin and end document hooks are ammended. If not specified, it defaults to three columns.

Key [class] `margin` The margin option lets you specify a uniform margin used for the reference card. This length will be passed on to the `geometry` package. If not specified, it defaults to 1 cm.

There are three options disabled, as they might clash with this class:

Key [disabled] `portrait` Reference cards are usually set in landscape format; therefore this option is ignored and

will produce a warning.

Key [disabled] `titlepage` Since the reference card should consist of two pages at most, there is no titlepage provided. This option is ignored and will result in a warning.

Key [disabled] `twocolumn` The class uses the `multicol` package as described above. If this option is specified, an error will result. To achieve the same effect, specify `columns=2` while loading the class.

2.2 Redefinitions

`\maketitle` The class redefines itemise environments to reduce the spacing around them. It also removes page numbers and numbers from sections. The `\maketitle` command has also been modified to produce a dense header.

2.3 New Environments

The environments accept optional arguments in the form of key-value pairs.

Key [Env] `labelfont` In description based environments the label font can be adjusted with e.g. `labelfont =\ttfamily`.

Key [Env] `envcolumns` In column based environments the number of columns can be set with e.g. `envcolumns =2`.

Key [Env] `cellalign` In table based environments the alignment of the cells can be adjusted with e.g. `cellalign=c`. The last column of a table is always fixed, see the environment descriptions below.

2.3.1 Description-based Environments

Env `refcardlist` The environment `refcardlist` is a description based list, which means that the item is a string, for example to use as a command. It automatically adjusts the width of the label to the longest one. The label can be formatted by specifying `labelfont=<command>`.

```
\begin{refcardlist}[labelfont=\ttfamily]
  \item[Short]         text text text
  \item[A long label]  text text text
  \item[Shorter]       text text text
\end{refcardlist}
```

Env `refcardinline` With the environment `refcardinline` the list will be set as a single paragraph. The label can be formatted by specifying `labelfont=<command>`. Items are joined by a semicolon (;) and the list is closed with a full stop (.).

```
\begin{refcardinline}[labelfont=\itshape]
  \item[Short]         text text text
```

```
  \item[A long label]  text text text
  \item[Shorter]       text text text
\end{refcardinline}
```

Env `refcardcolumnlist` The environment `refcardcolumnlist` provides access to a list, which is set in multiple columns. The number of columns can be given as an optional argument, in the form `envcolumns=<INT>`

```
\begin{refcardcolumnlist}
\begin{rscolslist}[envcolumns=5]
  \item text
  \item text
  \item text
  \item text
  \item text
  \item text
  \item text
  \item text
  \item text
\end{refcardcolumnlist}
```

Env `refcardverblist` While it is often desired for these cheat sheets, it is not easily implemented. For the time being, there is an environment which accepts "code": `refcardverblist`.

```
\begin{refcardverblist}[envcolumns=3]
  \item[\( \times   \)] \lstinline|\times|
  \item[\( \infty   \)] \lstinline|\infty|
  \item[\( \supset  \)] \lstinline|\supset|
  \item[\( \alpha   \)] \lstinline|\alpha|
  \item[\( \epsilon \)] \lstinline|\epsilon|
\end{refcardverblist}
```

It is (currently) not possible to use the verbatim string as a label. If this is desired, switch to a tabular based environment, which is described below.

2.3.2 Table based environments

The table based environments use the `tabularx` package, where the row of the table will fill the whole line.

Env `refcardtable` The first one is `refcardtable`. The number of columns can be changed in the optional argument, but defaults to two, e.g. `envcolumns=<INT>`. The alignment of the columns can be changed with `cellalign=<r|l|c|X>`. The last column, however, is special, because it is used to balance the table and therefore the column type is fixed as `X`.

As mentioned before, strings to be handled verbatim can be placed in this environment, see row 3.

```
\begin{refcardtable}[envcolumns=3,cellalign=c]
  \hline
  Short               & 1 & text text text\\
```

```
  A long label        & 2 & text text text\\
  \lstinline|Shorter| & 3 & text \lstinline|text| text\\
  \hline
\end{refcardtable}
```

Env `refcardmathtable` The second one is meant to be used for maths notation, called `refcardmathtable`, which has no argument. The first column is set in display style maths mode and will be fitted to the widest entry. The second column is meant for the description and like the table before, the type is fixed as X.

```
\begin{refcardmathtable}
  pV = nRT                      &  Ideal gas law \\
  0 = e^{i\pi} + 1              & Euler's identity \\
  \log(MN) = \log(M) + \log(N)  & Logarithm addition rule\\
\end{refcardmathtable}
```

3 Example Files

A documentation in reference card style can be found as an example in the GitHub repository in the demo directory.

4 Contributing and Issues

If you find something not working, or are missing features, you are welcome to raise an issue on GitHub/polyluxus/refcard or send a pull request.

5 License

The full repository is located at

https://github.com/polyluxus/refcard.

The current Maintainer is Martin C Schwarzer (polyluxus@gmail.com).

This class is mainly based on the Tex - Latex Stack Exchange question and answer:

Document Class for Reference Cards (https://tex.stackexchange.com/q/99765/33413).

It contains contributions from:

- Mike Renfro https://tex.stackexchange.com/users/3345 https://github.com/mikerenfro
- Sean Allred https://tex.stackexchange.com/users/17423 https://github.com/vermiculus
- Eric Berquist https://github.com/berquist

Other code has also been imported into this repository. This is highlighted in the commented source code.

See also https://github.com/polyluxus/refcard/CONTRIBUTORS

6 Implementation

6.1 Option definitions

These simple definitions for key-value pairs as class options are done with kvoptions as described in TUGBoat.[1] Using the prefix `rcopt@` as an inbetween to distinguish values set from class options in the document.

```
\RequirePackage{kvoptions}
\SetupKeyvalOptions{
  family=refcard,
  prefix=rcopt@
}
```

Defining how many columns shall be used. The initial value is to use three, This can and should be set as `columns=`$\{\langle int \rangle\}$ in the preamble. This option is disabled for the body of the document.

```
\DeclareStringOption[3]{columns}
\AtBeginDocument{%
  \DisableKeyvalOption[action=error,package=refcard]{refcard}{columns}}
```

Allow an option to set the standard margin via `geometry`.

```
\DeclareStringOption[1cm]{margin}
```

Before inheriting the standard class `article`, some options should be disabled to avoid potential clashes. Using these will result in warnings, or even errors.

```
\DeclareVoidOption{portrait}{%
  \PackageWarning{refcard}{Incompatible with portrait mode, setting will be ig
\DeclareVoidOption{twocolumn}{%
  \PackageError{refcard}{Using 'multicol' for columns, use columns=2 instead.}
\DeclareVoidOption{titlepage}{%
  \PackageWarning{refcard}{Incompatible with a title page, setting will be ign
```

Pass all other options to the `article` class and then process all options. Finally load the most current version of the standard class to inherit.

```
\DeclareDefaultOption{%
  \PassOptionsToClass{\CurrentOptionKey}{article}}

\ProcessKeyvalOptions{refcard}

\LoadClass{article}[2014/09/29]
```

[1] J. Wright, C. Feuersänger, TUGBoat, Vol. 30 (2009), No. 1, p. 110-122.

6.2 Additional Packages

Package `etoolbox` provides additional hooks like `\AtEndPreamble`.

```
\RequirePackage{etoolbox}
```

The page layout will be done with the package `geometry`. First define a new length, which will be set to the key-value pair set via the class options. Then load the package with landscape mode and setting the margin.

```
\RequirePackage{geometry}[2018/04/16]
\newlength\refcard@margin
\setlength\refcard@margin\rcopt@margin
\AtEndPreamble{%
  \geometry{landscape,margin=\refcard@margin}}
```

The page will be split in columns, therefore load `multicol`. The begin and end document hooks will be ammended to automatically load a multicolumn environment. The number of columns is set via the `columns=`{⟨*number*⟩} key in the class options.

```
\RequirePackage{multicol}[2018/04/20]
\AfterEndPreamble{%
  \begin{multicols}{\rcopt@columns}}
\AtEndDocument{%
  \end{multicols}}
```

6.3 Redifinition of the title

`\maketitle` The title should be set quite dense and centered.

```
\renewcommand{\maketitle}{%
  {%
   \begin{center}%
     \Large \@title \\%
     \vspace{0.1ex}%
     \small \@author, \@date%
   \end{center}%
  }%
}
```

6.4 Redefine document divisions

The `titlesec` package is used for manipulating the spacing around sections and subsections.

```
\RequirePackage{titlesec}
\titlespacing{\section}{0.05ex}{0.05ex}{0.05ex}
\titlespacing{\subsection}{0.05ex}{0.05ex}{0.05ex}
```

The `parskip` package is used to set indentation and paragraph separation spacing.

```
\RequirePackage[indent=0pt,skip=0.05ex]{parskip}
```

Since a reference card usually only consits of one or two pages, page numbers are unnecessary. This loads the package `nopageno` to supress them. This package redefines the definition of the pagestyle plain.

```
\RequirePackage{nopageno}
```

Section numbering is also superfluous for these document types, so it can be turned off.

```
\setcounter{secnumdepth}{0}
```

6.5 Redefinition and new environments

Load the package `enumitem` for more control and extensions of itemise, enumeration, and description environments. This class supports inline lists, so it seeds to be loaded with the appropriate option.

```
\RequirePackage[inline]{enumitem}[2019/06/20]
```

To generate denser lists, reduce spacing for items and above the environments globally. Redefine the `itemize` environment do use dashes, and to calculate the left margin automatically.

```
\setlist{noitemsep,topsep=0.05ex}
\setlist[itemize]{label=\textendash,leftmargin=*}
```

The package `environ` provides a more convinient interface for environment definitions.

```
\RequirePackage{environ}
```

For more convenient customisation of the environments, provide a key-value interface for the environments. These will control the font of the label, the number of columns used in the environments, and the alignment of some of the table columns.[2]

[2]Part of the following code is adapted from the answer of Werner (https://tex.stackexchange.com/users/5764) on How to create a command with key values? (https://tex.stackexchange.com/a/34314/33413) Note that the package `keyval` gets automatically loaded by `kvoptions`.

```
\define@key{rclist}{labelfont}{\def\refcard@labelfont{#1}}
\define@key{rclist}{envcolumns}{\def\refcard@envcolumns{#1}}
\define@key{rclist}{cellalign}{\def\refcard@cellalign{#1}}
```

Set some standard values to the above defined keys. The label should be set in bold, to match the standard of decription environments. Tables and column lists start with only two columns, the default alignment of the table columns is set to left.

```
\setkeys{rclist}{%
  labelfont=\bfseries,%
  envcolumns=2,%
  cellalign=l}%
```

6.5.1 Description like environments

Env `refcardlist` The most basic environment is of description type. The label of widest argument will be used throughout the entire list. This is determined automatically.[3]

First, define a length/ variable to hold the currently widest label.

```
\newlength\refcardlist@widestitem
```

The content of the environment is grouped to only affect the current definition. Apply the keys to the current environment.

```
\NewEnviron{refcardlist}[1][]{%
  \begingroup%
  \setkeys{rclist}{#1}%
```

The vbox is necessary to avoid missing item warnings.

```
  \vbox{%
    \global\refcardlist@widestitem=0pt%
    \def\item[##1]{%
      \settowidth\@tempdima{{\refcard@labelfont##1}}%
      \ifdim\@tempdima>\refcardlist@widestitem\relax
      \global\refcardlist@widestitem=\@tempdima\fi%
    }%
```

The \BODY is set in a box that is never used. It is only parsed to determine the widest item.

[3] The automatically adjusting label width is based on the answers by user121799 (no profile page) and Gonzalo Medina (https://tex.stackexchange.com/users/3954). Why conflict between mathtools and Gonzalo's solution for auto-adjusting description environment? (https://tex.stackexchange.com/q/461056/33413) Automatically set description list `labelwidth` based on widest label? (https://tex.stackexchange.com/q/130097/33413)

```
    \setbox0=\hbox{\BODY}%
  }
```

The actual definition of the environment. The font has to be reset as mentioned in the `enumitem` package manual.

```
  \begin{description}[%
    font=\normalfont\refcard@labelfont,%
    labelindent=0pt,%
    labelwidth=\refcardlist@widestitem]%
  \BODY
  \end{description}%
  \endgroup%
}
```

Env `refcardinline` The inline environment is used in unboxed mode to avoid awful spacing.[4] Items are joined with a semicolon, the label shall not devided from the following content, the list is terminated by a full stop.

```
%
\NewEnviron{refcardinline}[1][]{%
  \begingroup%
  \setkeys{rclist}{#1}
  \begin{description*}[%
    mode=unboxed,%
    font=\normalfont\refcard@labelfont,%
    itemjoin={{; }},%
    afterlabel={{\nobreakspace}},%
    after={{.}}]%
  \BODY
  \end{description*}%
  \endgroup%
}
```

Env `refcardcolumnlist` A list type environment that can be set in multiple columns. This is controlled via the key-values in the optional argument. The `itemize` environment is redefined to start a new line after each item, the label should also not be separated from its content. The number of columns is controlled with the `multicol` package, which is inthis case nested inside the main documents use.

```
\NewEnviron{refcardcolumnlist}[1][]{%
  \begingroup%
  \setkeys{rclist}{#1}
  \begin{multicols*}{\refcard@envcolumns}
    \begin{itemize*}[%
```

[4] See How can I fix the spacing in enumitem inline lists?

```
      itemjoin={{\newline}},%
      afterlabel={{\nobreakspace}}]
    \BODY
    \end{itemize*}%
  \end{multicols*}
  \endgroup%
}
```

Env `refcardverblist` The environments created with the `environ` package behave more like commands, than actual environments. Therefore they cannot handle verbatim input. Since this type of environment will probably be necessary, it needs to be defined differently, i.e. the standard way. The actual definition matches the above environment.

```
\newenvironment{refcardverblist}[1][]
{
  \begingroup
  \setkeys{rclist}{#1}
  \begin{multicols*}{\refcard@envcolumns}
    \begin{itemize*}[%
      itemjoin={{\newline}},%
      afterlabel={{\nobreakspace}}]
}{
    \end{itemize*}
  \end{multicols*}
  \endgroup
}
```

6.5.2 Table environments

Env `refcardtable` This environment provides an easier interface to create a full witdh table with one automagic column width. This is achieved by loading the `tabularx` package.

```
\RequirePackage{tabularx}
```

Define a new counter for the number of columns to be used. It has to be a counter, because it is used to do arithmetic evaluations.

```
\newcounter{refcard@tablecolumns@count}
```

The `array` package, which is loaded by `tabularx`, does not expand commands in the column definition. Tthis leads to an error where it does not recognise the token for the column alignment. With a bit of trickery, it is still possible[5] First define a new columntype, which will then be recognised, but actually will be used to expand the supplied

[5] This is based on the code provided by Bruno Le Floch (https://tex.stackexchange.com/users/2707) on the answer for How do I expand a macro into a tabular head? (https://tex.stackexchange.com/a/14460/33413)

input. This is achieved by redefining `\NC@rewrite@\expand` to use `\expandafter` to expand the next token.

```
\newcolumntype{\refcard@expandcoltype}{}
\long\@namedef{%
  NC@rewrite@\string\refcard@expandcoltype}{%
  \expandafter\NC@find}
```

Next the table is set up. The last column is used to balance the table, therefore it is fixed to be X. This is also the reason why the number of columns is reduced by one.

```
\NewEnviron{refcardtable}[1][]{%
  \begingroup%
  \setkeys{rclist}{#1}
  \setcounter{refcard@tablecolumns@count}{\refcard@envcolumns}
  \addtocounter{refcard@tablecolumns@count}{-1}
  \begin{tabularx}{\linewidth}{%
    *{\value{refcard@tablecolumns@count}}{%
      \refcard@expandcoltype\refcard@cellalign}%
    X}
    \BODY
  \end{tabularx}
  \endgroup%
}
```

Env `refcardtable` This environment provides an easier interface to create a full witdh table where the first column accepts math input. The last column is again used to balance the table and therefore is set to X package.

```
\NewEnviron{refcardmathtable}[1][]{%
  \begingroup%
  \setkeys{rclist}{#1}
  \setcounter{refcard@tablecolumns@count}{\refcard@envcolumns}
  \addtocounter{refcard@tablecolumns@count}{-2}
  \begin{tabularx}{\linewidth}{%
    >{\(\displaystyle}\refcard@expandcoltype\refcard@cellalign<{\)}%
    *{\value{refcard@tablecolumns@count}}{%
      \refcard@expandcoltype\refcard@cellalign}%
    X }
    \BODY
  \end{tabularx}
  \endgroup%
  }
```

That's it.