

# CNTFORMATS

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part of the **ExSHEETS** bundle

a different way to read counters

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## 1 Motivation

**CNTFORMATS** provides a way to format counters with what I will call patterns. This does not in any way effect the usual  $\text{\LaTeX}_{2\epsilon}$  way of treating counters and does not use `\the<counter>` nor is it affected by the redefinition of them.

This package is aimed at package or class authors and probably not very useful for document authors.

When I first had the idea for this package the idea of what it does already existed as part of the **ExSHEETS** package. I can't recall why I came up with the idea in the first place or why I originally wanted a new syntax for formatting the `question` counter. I am also not convinced any more that it is a good idea. Anyway, here we are.

## 2 License and Requirements

Permission is granted to copy, distribute and/or modify this software under the terms of the  $\text{\LaTeX}$  Project Public License (LPPL), version 1.3 or later (<http://www.latex-project.org/lppl.txt>).

### 3 Example

The software has the status “maintained.”

**CNTFORMATS** requires the etoolbox<sup>1</sup> package [Leh11] and the cnltx-base<sup>2</sup> package [Nie13].

### 3 Example

A use case typically looks as follows:

```
1 \ReadCounterPattern{se.sse} 3.0
```

where the key `se` stands for the current value of the section counter and `sse` for subsection, respectively. `se.sse` is an example for what will be called *pattern*. The keys for the counters can have optional arguments that specify the format:

```
1 \stepcounter{subsection} C(i)
2 \ReadCounterPattern{se[A](sse[r])}
```

A stands for `\Alph` and `r` for `\roman`. A complete list can be found in table 1b on page 5. As you can see you can insert arbitrary other tokens in a pattern that won't be changed. It is important to notice, though, that the patterns are only replaced if they're *not* placed in a braced group!

```
1 \ReadCounterPattern{{se[A](sse[r])}} se[A](sse[r])
```

I would imagine that the argument to `\ReadCounterPattern` is usually supplied by a user setting an option ...

```
1 \somesetupcommand{
2   counter-format = se[A](sse[r])
3 }
```

... and then internally used by the corresponding package or class.

### 4 Usage

In the following description of the available commands the symbol `*` means that the command is expandable.

In order to make counters known to **CNTFORMATS** the following commands are used:

`\AddCounterPattern*[\langle module \rangle]{\langle counter \rangle}{\langle pattern \rangle}`

This command will make the (existing) counter `\langle counter \rangle` known to **CNTFORMATS** and assign the pattern `\langle pattern \rangle` to it.

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1. on CTAN as etoolbox: <http://mirrors.ctan.org/macros/latex/contrib/etoolbox/>  
2. on CTAN as cnltx: <http://mirrors.ctan.org/macros/latex/contrib/cnltx/>

`\NewCounterPattern*[\langle module \rangle]{\langle counter \rangle}{\langle pattern \rangle}`

This command will create a new counter `\langle counter \rangle`, make it known to `CNTFORMATS` and assign the pattern `\langle pattern \rangle` to it.

`\ReadCounterFrom[\langle module \rangle]{\langle counter \rangle}{\langle internal cmd \rangle}`

If you use one of the commands above with the starred version the number for the pattern is not automatically fetched from the internal `\c@{\langle counter \rangle}`. This can now be assigned with `\ReadCounterFrom` where `\langle internal cmd \rangle` is the macro that holds the number.

The commands above can only be used in the document preamble.

After the creation of these pattern markers one wants to be able to use them. There are a number of macros that allow different aspects of usage.

`\ReadCounterPattern[\langle module \rangle]{\langle pattern \rangle}`

Reads, interprets and prints a pattern.

`*\@cntfmts@parsed@pattern`

After `\ReadCounterPattern` has been used the current pattern interpretation is stored in this macro. The *interpretation* is *not* what is printed. See the examples below for details.

`\ReadCounterPatternFrom[\langle module \rangle]{\langle macro that holds pattern \rangle}`

Reads, interprets and prints a pattern that's stored in a macro.

Otherwise the same as `\ReadCounterPattern`.

`\SaveCounterPattern{\langle cmd a \rangle}{\langle cmd b \rangle}{\langle pattern \rangle}`

Saves the `\langle pattern \rangle` in `\langle cmd a \rangle` and the interpreted pattern in `\langle cmd b \rangle`.

`\eSaveCounterPattern[\langle module \rangle]{\langle cmd a \rangle}{\langle cmd b \rangle}{\langle pattern \rangle}`

Saves the `\langle pattern \rangle` in `\langle cmd a \rangle` and the expanded pattern in `\langle cmd b \rangle`.

`\SaveCounterPatternFrom[\langle module \rangle]{\langle cmd a \rangle}{\langle cmd b \rangle}{\langle macro that holds pattern \rangle}`

Like `\SaveCounterPattern` but reads the pattern from a macro.

`\eSaveCounterPatternFrom[\langle module \rangle]{\langle cmd a \rangle}{\langle cmd b \rangle}{\langle macro that holds pattern \rangle}`

Like `\eSaveCounterPattern` but reads the pattern from a macro.

The optional argument `\langle module \rangle` should be specific for a package, say, so that different patterns for the section for example don't interfere with each other. If you leave the argument the default module `cntfmts` is used.

The `EXSHEETS` package uses the commands with the module `exsheets`. You can find the following lines in `EXSHEETS`' code:

```
1 \AddCounterPattern*[exsheets]{section}{se}
2 \ReadCounterFrom[exsheets]{section} \l__exsheets_counter_sec_int
3 \NewCounterPattern*[exsheets]{question}{qu}
4 \ReadCounterFrom[exsheets]{question} \l__exsheets_counter_qu_int
```

Now let's see a short example that hopefully explains what the macros do:

```

1 % preamble
2 % \NewCounterPattern{testa}{ta}
3 \setcounter{testa}{11}
4 \ReadCounterPattern{ta}
5 \ReadCounterPattern{ta[a]} \
6 \ttfamily\makeatletter
7 \meaning\@cntfmts@parsed@pattern
8
9 \bigskip
10 \SaveCounterPattern\tmpa\tmpb{ta[a]}
11 \meaning\tmpa \
12 \meaning\tmpb
13
14 \bigskip
15 \eSaveCounterPattern\tmpa\tmpb{ta[a]}
16 \meaning\tmpa \
17 \meaning\tmpb

```

---

```

11 k
macro:->\csuse {@cntfmts@read@ta@counter}[a]\@empty

macro:->ta[a]
macro:->\csuse {@cntfmts@read@ta@counter}[a]\@empty

macro:->ta[a]
macro:->k

```

You can see that somehow an additional `\@empty` found its way into the interpreted pattern. This is due to the fact that reading optional arguments expandably isn't easy and must have some safety net.

## 5 Predefined and New Patterns and Format Keys

### 5.1 Predefined Patterns and Format Keys

`CNTFORMATS` predefines a number of pattern keys. These are listed in table 1a.

### 5.2 New Patterns and Format Keys

Table 1b lists the predefined formats. If you want you can add own formats.

`\NewPatternFormat{<pattern>}{<format>}`

`<format>` is a number presentation command like `\@alph`, *i. e.*, it needs a mandatory argument that takes a number. It is used in `<format>` *without* its argument. This command can only be used in the preamble.

TABLE 1: Predefined Patterns and Format Keys.

(A) Predefined Patterns for the module cntfmts.

counter	pattern
chapter	ch
section	se
subsection	sse
subsubsection	ssse
paragraph	pg

(B) Predefined Format Keys

key	format
1	\arabic
a	\alph
A	\Alph
r	\roman
R	\Roman

Here are now a few examples of possible new patterns. Suppose the following code in the preamble:

```

1 \usepackage{alphalph,fmtcount}
2 \newcommand*{\myodddnumber[1]}{\the\numexpr2*(#1)-1\relax}
3
4 \NewPatternFormat{aa}{\alphalph}
5 \NewPatternFormat{o}{\ordinalnum}
6 \NewPatternFormat{x}{\myodddnumber}
7
8 \newcounter{testa}
9 \NewCounterPattern{testa}{ta}
10 \setcounter{testa}{4}

```

Then we can use the new pattern and the new formats as follows:

```

1 \ReadCounterPattern{ta[aa]}
2 \ReadCounterPattern{ta[o]}
3 \ReadCounterPattern{ta[x]}

```

---

d 4<sup>th</sup> 7

## Bibliography

- [Leh11] Philipp Lehman. etoolbox. version 2.1, Jan. 3, 2011.  
URL: <http://mirror.ctan.org/macros/latex/contrib/etoolbox/>.
- [Nie13] Clemens Niederberger. cnltx. version 0.7a, Oct. 4, 2013.  
URL: <http://mirror.ctan.org/macros/latex/contrib/cnltx/>.

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