Package nomencl.
Version 2.1

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1 Introduction

Some journals (e. g. *AIChE Journal*) require the authors to include lists of the used symbols in their articles. It seems that some universities require such lists in the theses.

Of course one can make such lists by hand. However it is tedious and error-prone. The package nomencl uses the powerful capabilities of the *MakeIndex* program to create these lists automatically. It provides versatile and easily customizable tools for creating nomenclatures in LaTeX 2ε documents.

While the package was written mainly for creating nomenclatures, it can be also used for creating and customizing glossaries.

2 Installation

Before you install... You need TeX, LaTeX 2ε (June 1995 release or later) and *MakeIndex* to use the package `nomencl`.

The installation is very simple. Put the file `nomencl.sty` where your store TeX-inputs files, and the file `nomencl.ist` where you store *MakeIndex* style files (`.ist` files). This file (`nomencl.tex`) provides the documentation.

3 Usage

3.1 The basics

The creation of the nomenclature list is very similar to the creation of an index [Lam94, Appendix A]. You need to:

- Put `\usepackage[`⟨*options*⟩`]{`*nomencl*`}` in the preamble of your document.
- Put `\makeglossary` in the preamble of your document.
- Issue the `\nomenclature` command (see Section 3.2) for each symbol you want to be included in the nomenclature list. The best place for this command is immediately after you introduce the symbol for the first time.
- Put `\printglossary` in the place you want to have your nomenclature list.

Now put your file through LaTeX. The command `\makeglossary` will instruct LaTeX to open the glossary file ⟨*filename*⟩`.glo`, where ⟨*filename*⟩ is the name of your TeX file (⟨*filename*⟩`.tex`) and to write there the information from your `\nomenclature` command.

On the next step you must invoke *MakeIndex*. You should instruct *MakeIndex* to:

- use ⟨*filename*⟩`.glo` as your input file,
- use `nomencl.ist` as your "style" file,
- write output to the file ⟨*filename*⟩`.gls`.

How to do this depends on your implementation of *MakeIndex*. For most UNIX implementations you write something like

```
makeindex ⟨filename⟩.glo -s nomencl.ist -o ⟨filename⟩.gls
```

For DOS you use the same command line, with `makeidx` instead of `makeindex`. The situation for Macintosh is more complex because at the moment there exist two different implementation of *MakeIndex* with different interfaces. It is discussed in more detail in Section 5.

Now you have the file ⟨*filename*⟩`.gls` that contains your nomenclature list properly ordered. On the last step you invoke LaTeX on your master file (⟨*filename*⟩`.tex`) once more. It will input your `.gls` file and process it accordingly to the current options. That's all!

3.2 The main command

```
\nomenclature[⟨prefix⟩]{var}{description}
```

⟨***prefix***⟩ is used for fine tuning the ordering (see below)

⟨***var***⟩ is the variable you want to describe

⟨***description***⟩ is the actual description

Put this command immediately after the equation or text that introduces ⟨*var*⟩. Don't forget to enclose math in ⟨*var*⟩ in `$` signs.[1] An example of the usage of the package is shown on Fig. 1 and Fig. 2.

[1] I considered including $...$ in the definition of the `nomenclature` command, but then decided against it. In the way it is now you can use this package for producing glossaries of non-math terminology. Besides, you can use regular expression search for math in a more consistent way

```
\documentclass{article}
\usepackage{nomencl}
\makeglossary

\begin{document}
\section*{Main equations}
\begin{equation}
        a=\frac{N}{A}
\end{equation}%
\nomenclature{$a$}{The number of angels per unit area}%
\nomenclature{$N$}{The number of angels per needle point}%
\nomenclature{$A$}{The area of the needle point}%
\begin{equation}
        \sigma = m a
\end{equation}%
\nomenclature{$\sigma$}{The total mass of angels per unit area}%
\nomenclature{$m$}{The mass of one angel}%

\printglossary

\end{document}
```

Figure 1: A simple input

Main equations

$$a = \frac{N}{A} \tag{1}$$

$$\sigma = ma \tag{2}$$

Nomenclature

σ The total mass of angels per unit area

A The area of the needle point

a The number of angels per unit area

m The mass of one angel

N The number of angels per needle point

Figure 2: The output of Fig. 1

3.3 Ordering of entries

The Greek letter σ turned out to be first in the nomenclature list on Fig.2 because the backslash in `\sigma` precedes any alphabetical character. Sometimes it is not what you want. Then you can use $\langle prefix \rangle$ to fine tune the ordering. The entries are ordered by *MakeIndex* according to the string $\langle prefix \rangle\langle var \rangle$.[2] By default the prefix is the letter 'a'.[3] To put the definition of σ at the end of the nomenclature list let us change the definiton of *sigma* on Fig. 1 to

```
\nomenclature[g]{$\sigma$}{The total mass...}%
```

('g' is from 'Greek'). Since the letter 'a' precedes the letter 'g', the entry for σ will be put last. Note that *MakeIndex* will insert an extra amount of space (`\indexspace`) between the Roman and Greek letters (see Fig. 5). The more sophisticated use of $\langle prefix \rangle$ for customization of the output is described in Section 4 and illustrated by Fig. 6 and Fig. 7.

3.4 Referencing

Sometimes a reference to the equation or page where the symbol was introduced gives more information than the long definition. You can insert references manually using something like `see equation (\protect\ref{MyEq})` in the $\langle description \rangle$. However, the package `nomencl` has various means to make this task easier.

First, you can use package options:

Package Options `refeq`, `refpage`, `norefeq`, `norefpage`

The option `refeq` appends to the description the phrase ", see equation ($\langle eq \rangle$)", where $\langle eq \rangle$ is the number of the last equation before the command `\nomenclature`. Analoguously the option `refpage` inserts the reference to the number of the page corresponding to the command `\nomenclature`. The options `norefeq` and `norefpage` are default. They do not produce the corresponding reference. Fig. 3 shows how the options `refeq` and `refpage` influence the output.

It seems that the package options `refeq` and `refpage` are useful while preparing the manuscript. They allow you to quickly find the `\nomenclature` command in the text. However in the final version you may want to reference only *some* entries. This can be done using a number of commands.

[2] For TEXperts: the command `nomenclature` writes $\langle prefix \rangle\langle var \rangle$`@[`$\langle var \rangle$`]` $\langle description \rangle$ to the glossary file

[3] It is neccessary to precede the 'symbol' \$ in $\langle var \rangle$ by an alphabetic letter because *MakeIndex* processes strings that begin with symbols in a special way, see [CH].

Main equations

$$a = \frac{N}{A} \tag{1}$$

$$\sigma = ma \tag{2}$$

Nomenclature

σ The total mass of angels per unit area, see equation (2), page 1

A The area of the needle point, see equation (1), page 1

a The number of angels per unit area, see equation (1), page 1

m The mass of one angel, see equation (2), page 1

N The number of angels per needle point, see equation (1), page 1

Figure 3: The output of Fig. 1 if the options `refeq` and `refpage` are used

Mask	Meaning
Y	The reference is included
N	The reference is suppressed
O	Determined by the package option

Table 1: Arguments of the `nomref` command

`\refeq`, `\refpage`, `\refeqpage`

If any of these commands is included at the end of ⟨*description*⟩, the correponding reference is included in the nomenclature. *Warning:* dont't use both commands `\refeq` and `refpage` in the same description—use `\refeqpage` instead!

Even more powerful command is

`\nomref{`*EqMask*`}{`*PageMask*`}`

Each of the arguments can have one of the values (case-sensitive!) `Y`, `N`, `O` with obvious meanings (see Table 1).

For example, the commands `\refeq`, `\refpage` and `\refeqpage` are defined as `\nomref{Y}{O}`, `\nomref{O}{Y}` and `\nomref{Y}{Y}` correspondingly.

An example of using these commands is shown on Fig. 4 and Fig. 5.

```
\documentclass{article}
\usepackage{nomencl}
\makeglossary

\begin{document}
\section*{Main equations}
\begin{equation}
        a=\frac{N}{A}
\end{equation}%
\nomenclature{$a$}{The number of angels per unit area\refeq}%
\nomenclature{$N$}{The number of angels per needle point\refpage}%
\nomenclature{$A$}{The area of the needle point\refeqpage}%
\begin{equation}
        \sigma = m a
\end{equation}%
\nomenclature[g]{$\sigma$}{The total mass of angels per unit area}%
\nomenclature{$m$}{The mass of one angel\nomref{N}{Y}}%

\printglossary

\end{document}
```

Figure 4: Referencing Commands

Main equations

$$a = \frac{N}{A} \tag{1}$$

$$\sigma = ma \tag{2}$$

Nomenclature

A The area of the needle point, see equation (1), page 1

a The number of angels per unit area, see equation (1)

m The mass of one angel, page 1

N The number of angels per needle point, page 1

σ The total mass of angels per unit area

Figure 5: The output of Fig. 4

4 Customization

To customize the package you can redefine its commands and environments using `\renewcommand` and `\renewenvironment`. The basic commands are listed here.

The default prefix in the `\nomenclature` command is determined by the `\nomprefix` command.

The phrases that reference equations and pages are determined by the commands `\eqdeclaration` and `\pagedeclaration`. Both these commands have one argument—the number of the equation or the page. For example, if you put in the preamble of your document the following lines:

```
\renewcommand{\eqdeclaration}[1]{%
, as the brilliant equation (#1) states}
```

your document will proudly announce how good you are.

The title of the nomenclature section is determined by the command `\nomname`. By default it is `\section*{Nomenclature}`.

The format of the nomenclature list itself is determined by the environment `theglossary`. By default it is a simple `description` environment with `\nomname` in the beginning. Using the powerful `list` capabilities of LaTeX 2_ε (see [Lam94]) you can format it virtually in any way.

An additional possibility of formatting the output is provided by the grouping feature of *MakeIndex*. *MakeIndex* separates the entries that begin with the same letter into *groups*[4]. At the beginning of each group it inserts the *group header*, and between the groups it inserts the amount of vertical space `\indexspace`. The file `\nomencl.ist` determines the group header as the command `\nomgroup{`*Letter*`}`, where ⟨*Letter*⟩ is the first letter of all the entries of the group (upper case). By default this command produces nothing. However it can be redefined to do something nice. For example, suppose that we precede all Greek letters by the prefix `[g]`. Then we will have two groups: Roman letters that begin with the default prefix 'a' and Greek letters that begin with the prefix 'g'. Now we can request the command `\nomgroup{A}` to produce the subtitle *Roman letters* and the command `\nomgroup{G}` to produce the subtitle *Greek letters*. An example of such grouping is shown on Fig. 6. In the same manner you can group together subscripts, special symbols, etc.

`nomencl.cfg`

If you have some customization commands that you use consistently in many documents, put them in the file `nomencl.cfg`. If this file exists in your search path, it is read by the `nomencl` package.

[4]Non-letter symbols are lumped together in the same group. The grouping is case-insensitive.

```
\documentclass{article}
\usepackage{nomencl}
\usepackage{ifthen}
\makeglossary

\renewcommand{\nomgroup}[1]{
        \ifthenelse{\equal{#1}{A}}{
                \item \emph{Roman letters}
        }{
                \ifthenelse{\equal{#1}{G}}{
                        \item \emph{Greek letters}
                }{
                }
        }{
        }
}

\begin{document}
\section*{Main equations}
\begin{equation}
        a=\frac{N}{A}
\end{equation}%
\nomenclature{$a$}{The number of angels per unit area}%
\nomenclature{$N$}{The number of angels per needle point}%
\nomenclature{$A$}{The area of the needle point}%
\begin{equation}
        \sigma = m a
\end{equation}%
\nomenclature[g]{$\sigma$}{The total mass of angels per unit area}%
\nomenclature{$m$}{The mass of one angel}%

\printglossary

\end{document}
```

Figure 6: Grouping of entries

Main equations

$$a = \frac{N}{A} \tag{1}$$

$$\sigma = ma \tag{2}$$

Nomenclature

Roman letters

A The area of the needle point

a The number of angels per unit area

m The mass of one angel

N The number of angels per needle point

Greek letters

σ The total mass of angels per unit area

Figure 7: The output of Fig. 6

5 Bugs, limitations and notes

I tested the package with LaTeX 2_ε and `amsmath` option on MS-DOS (gTeX), Macintosh (OzTeX) and Unix (Ultrix 4.4, teTeX). Interesting enough, the most trouble-free environment is gTeX—thanks to Dr. Young for a very stable and sound suite of programs. I don't have emTeX on my computers, so I cannot test the package for this environment. Please inform me about any problems here.

On Unix it seems that the search path for `.ist` files is not defined by `kpathsea`. You can define it by the environment variable `INDEXSTYLE`. Issue a command equivalent to

`setenv INDEXSTYLE` ⟨*path*⟩

On Macintosh there are two different implementations of *MakeIndex*. The older one is *MacMakeindex* by Johny Tolliver. For this implementation you choose output and style files from the Config menu and the input file from the File menu. Unfortunately this implementation cannot handle index entries longer than about 80 letters. It makes it almost useless for glossary handling.

A newer implementation is *MakeIndex Fat* by Rick Zaccone. It works for Power

Mac and 680x0 and has no limit for the length of the entries. Unfortunately its interface is very limited:

1. The input file *must* have the extension `.idx`
2. The output file is always called `foo.ind` where `foo` is the filename of the `.idx` file
3. The style file must be called `foo.ist` where `foo` is the filename of the `.idx` file and it must be in the same folder as the `foo.idx` file

Therefore if you use this package and Rick's program on Macintosh, you need to:

1. Copy the file `nomencl.ist` to the folder where your main LaTeX file resides and rename it ⟨*filename*⟩`.ist`, where ⟨*filename*⟩ is the name of your LaTeX file.
2. After LaTeXing rename the file ⟨*filename*⟩`.glo` to ⟨*filename*⟩`.idx` and execute *MakeIndex*.
3. Rename the file ⟨*filename*⟩`.ind` to ⟨*filename*⟩`.gls` and execute LaTeX once more.

Some other limitations:

1. Since the symbol '@' has a special meaning for *MakeIndex*, precede it by the quote character (\ by `nomencl.ist` default). The package does *not* provide pages contracting (see [CH]). If you need such feature, you probably need an index instead of glossary.
2. The arguments of the `\nomenclature` commands are moving. Protect the fragile commands!
3. The handling of Greek letters is far from perfect but can be improved by the judicious use of the optional argument of the `\nomenclature` command.

Feel free to report bugs and suggestions to `bav2@psu.edu`.

6 Legalese

The package `nomencl` is provided "as is" and comes with absolutely no warranty. It is covered by the same license as the current LaTeX 2_ε package (see the files `legal.txt` and `modguide.tex` in the LaTeX 2_ε distribution).

References

[CH] P. Cheng and M. A. Harrison. Index preparation and processing. CTAN, `ind.tex`.

[Lam94] L. Lamport. *LaTeX: a document preparation system.* Addison-Wesley Publishing Company, Reading, Ma; Menlo Park, Ca; New York; Don Mills, Ontario; Workingham, England; Amsterdam; Bonn; Sydney; Syngapore; Tokyo; Madrid; San Juan; Milan; Paris, 2 edition, 1994.