`smglom.cls/sty`: Semantic Multilingual Glossary for Math

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Abstract

The `smglom` package is part of the SᴛᴇX collection, a version of TᴇX/LᴬTᴇX that allows to markup TᴇX/LᴬTᴇX documents semantically without leaving the document format, essentially turning TᴇX/LᴬTᴇX into a document format for mathematical knowledge management (MKM).

This package supplies an infrastructure for writing OMDoc glossary entries.

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2.1 Package and Class Options

`smglom.cls` accepts all options of the `omdoc.cls` and `article.cls` and just passes them on to these.

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[1]

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[2]

2.4 Namespaces and Alignments

[3] In SMGloM, we often want to align the content of glossary modules to formalizations, e.g. to take advantage of type declarations there. The `\symalign` macro takes two regular arguments: the first is the name symbol declared in the current module (e.g. by a `\symi`), and the second the URI name of a symbol in an external theory in the form $\langle theory \rangle ? \langle name \rangle$.

As full MMT URIs are of the form $\langle URI \rangle ? \langle theory \rangle ? \langle name \rangle$, we need a way to specify the $\langle URI \rangle$. We adopt the system of **namespaces** of in MMT: the `\namespace` macro declares a namespace URI. If the optional argument is given, then this is a namespace abbreviation declaration, which can be used later, for instance in `\symalign` that takes an optional first argument: the namespace of the external theory.

The situation below is typical. We first declare the namespace abbreviation `sets` and then use the `\modalign` macro to specify that the external theory `sets:?ESet` is the default alignment target, i.e. any symbol that in the local `emptyset` module is aligned by default to the symbol with the same name in the external `sets:?ESet` theory.

```
\begin{modsig}[creators=miko]{emptyset}
  \gimport{set}
  \namespace[sets]{http://mathhub.info/MitM/smglom/sets}
  \modalign[sets]{ESet}

  \symdef{eset}{\emptyset}
```

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[1] EDNOTE: document them
[2] EDNOTE: document them
[3] EDNOTE: MK: maybe this should go into some other module; it seems awfully foundational.

```
 \symi{non-empty}
 \symalign{non-empty}{ESet?non_empty}
\end{modsig}
```

The default alignment breaks down for the symbol `non-empty`, so we specify an alignment to the symbol `Eset?non_empty` via `\symalign`.

3 Implementation: The SMGloM Class

3.1 Class Options

To initialize the `smglom` class, we pass on all options to `omdoc.cls` as well as the `stex` and `smglom` packages.

```
 1 ⟨∗cls⟩
 2 \DeclareOption*{\PassOptionsToClass{\CurrentOption}{omdoc}
 3                                   \PassOptionsToPackage{\CurrentOption}{stex}
 4                                   \PassOptionsToPackage{\CurrentOption}{smglom}}
 5 \ProcessOptions
```

We load `omdoc.cls`, the `smglom` package that provides the SMGloM-specific functionality[4], and the `stex` package to allow OMDoc compatibility.

```
 6 \LoadClass{omdoc}
 7 \RequirePackage{smglom}
 8 \RequirePackage{stex}
 9 \RequirePackage{amstext}
10 \RequirePackage{amsfonts}
11 ⟨/cls⟩
```

Now we do the same thing for the package; first the options, which we just pass on to the `stex` package.

```
12 ⟨∗sty⟩
13 \DeclareOption*{\PassOptionsToPackage{\CurrentOption}{statements}
14                                   \PassOptionsToPackage{\CurrentOption}{structview}
15                                   \PassOptionsToPackage{\CurrentOption}{smultiling}}
16 \ProcessOptions
```

We load `omdoc.cls`, and the desired packages. For the LaTeXML bindings, we make sure the right packages are loaded.

```
17 \RequirePackage{statements}
18 \RequirePackage[langfiles]{smultiling}
19 \RequirePackage{structview}
```

3.2 Convenience Macros for SMGloM Modules

\gimport   Just a shortcut, we have a starred and unstarred version, the first one is conservative. For example, if we execute:

$$\gimport[smglom/numberfields]{naturalnumbers}$$

First we are redirected to `\@gimport@nostar`, we store the `smglom/numberfields`⟨*the repo's path*⟩ in `\@test`, then store `\mh@currentrepos`⟨*current directory*⟩ in `\mh@repos`. If no repo's path is offered, that means the module to import is

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[4]EDNOTE: MK:describe that above

under the same directory, so we let `repos=\mh@repos` and pass bunch of parameters to `\importmhmodule`, which is defined in `module.sty`. If there's a repo's path, then we let repos=⟨*the repo's path*⟩. Finally we use `\mhcurrentrepos`(defined in `module.sty`) to change the `\mh@currentrepos`.

```
20 \def\gimport{\@ifstar\@gimport@star\@gimport@nostar}%
21 \newrobustcmd\@gimport@star[2][]{%
22    \def\@test{#1}%
23    \edef\mh@@repos{\mh@currentrepos}%
24    \ifx\@test\@empty%
25      \importmhmodule[conservative,repos=\mh@@repos,ext=tex,path=#2]{#2}%
26    \else%
27      \importmhmodule[conservative,repos=#1,ext=tex,path=#2]{#2}%
28    \fi%
29    \mhcurrentrepos{\mh@@repos}%
30    \ignorespacesandpars%
31 }%
32 \newrobustcmd\@gimport@nostar[2][]{%
33    \def\@test{#1}%
34    \edef\mh@@repos{\mh@currentrepos}%
35    \ifx\@test\@empty%
36      \importmhmodule[repos=\mh@@repos,ext=tex,path=#2]{#2}%
37    \else%
38      \importmhmodule[repos=#1,ext=tex,path=#2]{#2}%
39    \fi%
40    \mhcurrentrepos{\mh@@repos}%
41    \ignorespacesandpars%
42 }%
```

guse   just a shortcut

```
43 \newrobustcmd\guse[2][]{\def\@test{#1}%
44    \edef\mh@@repos{\mh@currentrepos}%
45    \ifx\@test\@empty%
46      \usemhmodule[repos=\mh@@repos,ext=tex,path=#2]{#2}%
47    \else%
48      \usemhmodule[repos=#1,ext=tex,path=#2]{#2}%
49    \fi%
50    \mhcurrentrepos{\mh@@repos}%
51    \ignorespacesandpars%
52 }%
```

gstructure   we essentially copy over the definition of `mhstructure`, but adapt it to the SM-GloM situation.

```
53 \newenvironment{gstructure}[3][]{\def\@test{#1}%
54    \xdef\mh@@@repos{\mh@currentrepos}%
55    \ifx\@test\@empty%
56      \gdef\@@doit{\importmhmodule[repos=\mh@@@repos,path=#3,ext=tex]{#3}}%
57    \else%
58      \gdef\@@doit{\importmhmodule[repos=#1,path=#3,ext=tex]{#3}}%
59    \fi%
```

```
60    \ifmod@show\par\noindent structure import "#2" from module #3 \@@doit\fi%
61    \ignorespacesandpars}
62 {\aftergroup\@@doit\ifmod@show end import\fi%
63    \ignorespacesandparsafterend}
```

3.3   Terminological Relations

```
64 \newrobustcmd\hypernym[3][]{\if@importing\else\par\noindent #2 is a hypernym of #3\fi}%
65 \newrobustcmd\hyponym[3][]{\if@importing\else\par\noindent #2 is a hyponym of  #3\fi}%
66 \newrobustcmd\meronym[3][]{\if@importing\else\par\noindent #2 is a meronym of #3\fi}%
```

EdN:5   \MSC   to define the Math Subject Classification, [5]

```
67 \newrobustcmd\MSC[1]{\if@importing\else MSC: #1\fi\ignorespacesandpars}%
```

3.4   Namespaces and Alignments

\namespace

```
68 \newcommand\namespace[2][]{\ignorespaces}
```

\modalign

```
69 \newcommand\modalign[2][]{\ignorespaces}
```

\symalign

```
70 \newcommand\symalign[3][]{\ignorespaces}
```

3.5   For Language Bindings

Here we adapt the smultiling functionality to the special situation, where the module and file names are identical by design.

gviewsig   The gviewsig environment is just a layer over the mhviewsig environment with the keys suitably adapted.

```
71 \newenvironment{gviewsig}[4][]{% keys, id, from, to
72    \def\test{#1}%
73    \ifx\@test\@empty%
74       \begin{mhviewsig}[frompath=#3,topath=#4]{#2}{#3}{#4}%
75    \else%
76       \begin{mhviewsig}[frompath=#3,topath=#4,#1]{#2}{#3}{#4}%
77    \fi%
78    \ignorespacesandpars%
79 }{%
80    \end{mhviewsig}%
81    \ignorespacesandparsafterend%
82 }%
```

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[5]EdNote: MK: what to do for the LaTeXML side?

gviewnl   The `gviewnl` environment is just a layer over the `mhviewnl` environment with the keys suitably adapted.

```
83 \newenvironment{gviewnl}[5][]{% keys, id, lang, from, to
84   \def\@test{#1}\ifx\@test\@empty%
85     \begin{mhviewnl}[frompath=#4,topath=#5]{#2}{#3}{#4}{#5}%
86   \else%
87     \begin{mhviewnl}[frompath=#4,topath=#5,#1]{#2}{#3}{#4}{#5}%
88   \fi%
89 \ignorespacesandpars%
90 }{%
91   \end{mhviewnl}%
92   \ignorespacesandparsafterend%
93 }%
```

EdN:6   \gincludeview   [6]

```
94 \newcommand\gincludeview[2][]{\ignorespacesandpars}%
```

3.6   Authoring States, etc

We add a key to the module environment.

```
95 \addmetakey{module}{state}%
```

3.7   Shadowing of repositories

\repos@macro   `\repos@macro` parses a GitLab repository name $\langle group\rangle/\langle name\rangle$ and creates an internal macro name from that, which will be used

```
96 \def\repos@macro#1/#2;{#1@shadows@#2}%
```

\shadow   `\shadow{`$\langle orig\rangle$`}{`$\langle fork\rangle$`}` declares a that the private repository $\langle fork\rangle$ shadows the MathHub repository $\langle orig\rangle$. Internally, it simply defines an internal macro with the shadowing information.

```
97 \def\shadow#1#2{\@namedef{\repos@macro#1;}{#2}}%
```

\MathHubPath   `\MathHubPath{`$\langle repos\rangle$`}` computes the path of the fork that shadows the MathHub repository $\langle repos\rangle$ according to the current `\shadow` specification. The computed path can be used for loading modules from the private version of $\langle repos\rangle$.

```
98 \def\MathHubPath#1{\@ifundefined{\repos@macro#1;}{#1}{\@nameuse{\repos@macro#1;}}}%
99 ⟨/sty⟩
```

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[6]EDNOTE: This is fake for now, needs to be implemented and documented