The glossaries package v4.54: a guide for beginners

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The glossaries package is very flexible, but this means that it has a lot of options, and since a user guide is supposed to provide a complete list of all the high-level user commands, the main user manual is quite big. This can be rather daunting for beginners, so this document is a brief introduction just to help get you started. If you find yourself saying, "Yeah, but how can I do…?" then it's time to move on to the main user manual (glossaries-user.pdf).

I've made some statements in this document that don't actually tell you the full truth, but it would clutter the document and cause confusion if I keep writing "except when …" or "but you can also do this, that or the other" or "you can do it this way but you can also do it that way, but that way may cause complications under certain circumstances".

Contents

1 Getting Started

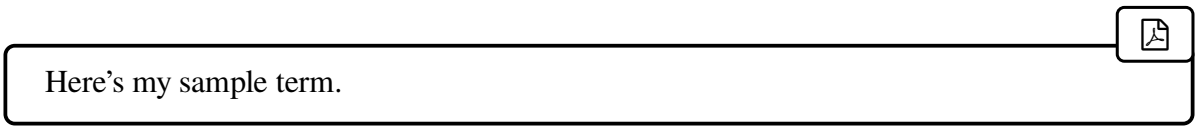
As with all packages, you need to load glossaries with `\usepackage`, but there are certain packages that must be loaded before glossaries, *if* they are required: hyperref, babel, polyglossia, inputenc and fontenc. (You don't have to load these packages, but if you want them, you must load them before glossaries.)

If you require multilingual support you must also install the relevant language module. Each language module is called `glossaries-`⟨*language*⟩, where ⟨*language*⟩ is the root language name. For example, `glossaries-french` or `glossaries-german`. If a language module is required, the glossaries package will automatically try to load it and will give a warning if the module isn't found.

Once you have loaded glossaries, you need to define your terms in the preamble and then you can use them throughout the document. Here's a simple example:

```
\documentclass{article}
\usepackage{glossaries}
% define a term:
\newglossaryentry{ex}{name={sample},description=
{an example}}
\begin{document}
Here's my \gls{ex} term.
\end{document}
```

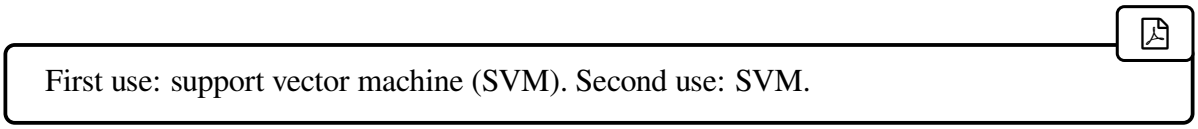
This produces:



Another example:

```
\documentclass{article}
\usepackage{glossaries}
\setacronymstyle{long-short}
\newacronym{svm}{SVM}{support vector machine}
\begin{document}
First use: \gls{svm}. Second use: \gls{svm}.
\end{document}
```

This produces:



In this case, the text (the "link text") produced by `\gls{svm}` changed after the first use. The first use produced the long form followed by the short form in parentheses because I set the acronym style to long-short. The subsequent use just showed the short form.

I suggest you try the above two examples to make sure you have the package correctly installed. If you get an "undefined control sequence" error, check that the version number at the top of this document matches the version you have installed. (Open the `log` file and search for the line that starts with "Package: glossaries" followed by a date and version.)

Be careful of fragile commands. If a command causes a problem when used in one of the `\newglossaryentry` fields, consider adding `\glsnoexpandfields` before you start defining your entries. Where possible use robust semantic commands.

Abbreviations are slightly different if you use the extension package glossaries-extra (which needs to be installed separately):

```
\documentclass{article}
% glossaries.sty is automatically loaded by glossaries-extra.sty
\usepackage{glossaries-extra}
% commands provided by glossaries-extra:
\setabbreviationstyle{long-short}
```

```
\newabbreviation{svm}{SVM}{support vector machine}
\begin{document}
First use: \gls{svm}. Second use: \gls{svm}.
\end{document}
```

Since long−short happens to be the default for \newabbreviation you may omit the \setabbreviationstyle line in this example.

If you still want to use \newacronym (rather than \newabbreviation) then you need the optional argument of \setabbreviationstyle:

```
\documentclass{article}
\usepackage{glossaries-extra}
\setabbreviationstyle[acronym]{long-short}
\newacronym{svm}{SVM}{support vector machine}
\begin{document}
First use: \gls{svm}. Second use: \gls{svm}.
\end{document}
```

In this example, if you omit the \setabbreviationstyle line you will notice a difference because the short−nolong style (not the long−short style) is the default with \newacronym. With the short−nolong style the first use simply shows just the short form.

You can't use \setacronymstyle with glossaries−extra.

If you like, you can put all your definitions in another file (for example, defns.tex) and load that file in the preamble using \loadglsentries with the filename as the argument. For example:

```
\loadglsentries{defns}
```

If you find you have a really large number of definitions that are hard to manage in a tex file, you might want to have a look at bib2gls (installed separately) which requires a bib format instead that can be managed by an application such as JabRef.

Don't try inserting formatting commands into the definitions as they can interfere with the underlying mechanism. Instead, the formatting should be done by the style. For example, suppose I want to replace SVM with \textsc{svm}, then I need to select a style that uses \textsc, like this (for the base glossaries style):

```
\documentclass{article}
\usepackage{glossaries}
\setacronymstyle{long-sc-short}
\newacronym{svm}{svm}{support vector machine}
\begin{document}
First use: \gls{svm}. Second use: \gls{svm}.
\end{document}
```

The abbreviation styles have a different naming scheme with glossaries−extra:

```
\documentclass{article}
\usepackage{glossaries-extra}
\setabbreviationstyle{long-short-sc}
% glossaries-extra.sty
\newabbreviation{svm}{svm}{support vector machine}
\begin{document}
First use: \gls{svm}. Second use: \gls{svm}.
\end{document}
```

With glossaries−extra you can have multiple abbreviation styles for different categories. Many of these styles have their own associated formatting commands that can be redefined for minor adjustments. For example:

```
\documentclass{article}
\usepackage{glossaries-extra}
\setabbreviationstyle[statistical]{long-short-sc}
\setabbreviationstyle[bacteria]{long-only-short
-only}
% Formatting commands used by 'long-only-short-only' style:
\renewcommand*{\glsabbrvonlyfont}[1]{\emph{#1}}
\renewcommand*{\glslongonlyfont}[1]{\emph{#1}}

% Formatting command used by 'long-short-sc' style:
% (the following converts the abbreviation to lowercase)
\renewcommand*{\glsabbrvscfont}[1]{\textsc{\gls-
lowercase{#1}}}

\newabbreviation
 [
```

```
    category={statistical}% glossaries-extra.sty key
  ]
  {svm}{SVM}{support vector machine}

\newabbreviation
  [
    category={bacteria}% glossaries-extra.sty key
  ]
  {cbot}{C.~botulinum}{Clostridium botulinum}

\begin{document}
First use: \gls{svm}, \gls{cbot}.

Next use: \gls{svm}, \gls{cbot}.
\end{document}
```

This produces:

First use: support vector machine (SVM), *Clostridium botulinum*.
Next use: SVM, *C. botulinum*.

As you can hopefully see from the above examples, there are two main ways of defining a term: as a general entry (`\newglossaryentry`) or as an abbreviation (`\newacronym` or, with glossaries-extra, `\newabbreviation`).

Regardless of the method of defining a term, the term is always given a label. In the first example, the label was `ex` and in the other examples the label was `svm` (and `cbot` in the last example). The label is used to uniquely identify the term (like the standard `\label`/`\ref` or `\cite` mechanism). The label may be the same as the text produced with `\gls` (provided it doesn't contain any formatting commands) or may be completely different.

The labels are identified in bold in the following:

```
\newglossaryentry{elite}{name={élite},
 description={select group}}
\newglossaryentry{set}{name={set},
 description={collection of distinct elements}}
\newglossaryentry{sym.set}{
 name={\ensuremath{\mathcal{S}}},
 description={a set}}
\newacronym{tool.cnc}{CNC}
{computer numerical control}
```

```
\newacronym{police.cnc}{CNC}
{civil nuclear constabulary}
\newacronym{miltary.cnc}{CNC}{commander in chief}
```

With modern TEX installations you may now be able to use UTF-8 characters in the label, but beware of active characters. For example, babel makes some punctuation characters, such as : (colon), active. This means that the character behaves like a command, which allows extra spacing to be inserted before or after the punctuation mark or provides a shortcut to apply an accent to a following character.

For example, the following works:

```
\documentclass{article}
\usepackage{glossaries}
\newglossaryentry{sym:set}{name={\ensuremath
{\mathcal{S}}},
 description={a set}}
\begin{document}
\gls{sym:set}
\end{document}
```

However, if babel is loaded with `french` then the : (colon) character becomes active.

```
\documentclass{article}
\usepackage[T1]{fontenc}
\usepackage[french]{babel}
\usepackage{glossaries}

% the colon : is a normal character here
\newglossaryentry{sym:set}{name={\ensuremath
{\mathcal{S}}},
 description={a set}}

\begin{document}
% the colon : is now an active character
\gls{sym:set}
\end{document}
```

You may find that the above example seems to work, but a problem will occur if hyperref and a glossary are added to the document as the active character will interfere with the hyperlink target name.

Don't use \gls in chapter or section headings as it can have some unpleasant side-effects. Instead use \glsentrytext for regular entries and either \glsentryshort or \glsentrylong for acronyms. Alternatively use glossaries-extra which provides special commands for use in section headings and captions, such as \glsfmttext and \glsfmtshort.

The above examples are reasonably straightforward. The difficulty comes if you want to display a *sorted* list of all the entries you have used in the document. The glossaries-extra package provides an easy way of listing all the defined entries:

```
\documentclass{article}

\usepackage[sort=none]{glossaries-extra}

\newglossaryentry{potato}{name={potato},plural=
{potatoes},
 description={starchy tuber}}

\newglossaryentry{cabbage}{name={cabbage},
 description=
{vegetable with thick green or purple leaves}}

\newglossaryentry{turnip}{name={turnip},
  description={round pale root vegetable}}

\newglossaryentry{carrot}{name={carrot},
  description={orange root}}

\begin{document}
Chop the \gls{cabbage}, \glspl{potato} and \glspl
{carrot}.

\printunsrtglossaries % list all entries
\end{document}
```

However this method doesn't sort the entries (they're listed in order of definition) and it will display all the defined entries, regardless of whether or not you've used them all in the document, so "turnip" appears in the glossary even though there's no \gls{turnip} (or similar) in the document.

The sort=none option isn't essential in this case (there's no other sort option available for this document), but it prevents the automatic construction of the sort value and so slightly

improves the document build time.

Note that this example document uses the same command (`\printunsrtglossaries`) that's used with `bib2gls` (Option 4) but with `bib2gls` you instead need to use the `record` package option and one or more instances of `\GlsXtrLoadResources` in the preamble (see below).

Most users prefer to have an automatically sorted list that only contains entries that have been used in the document, optionally with a page list (indexing). The glossaries package provides three options: use TEX to perform the sorting (Option 1); use `makeindex` to perform the sorting (Option 2); use `xindy` to perform the sorting (Option 3). The extension package glossaries−extra provides a fourth method: use `bib2gls` (Option 4).

The first option (using TEX) is the simplest method, as it doesn't require an external tool, but it's very inefficient and the sorting is done according to lower case character code (which matches basic Latin alphabets, such as English, but not extended Latin alphabets, such as Icelandic) or non-Latin alphabets. To use this method, add `\makenoidxglossaries` to the preamble and put `\printnoidxglossaries` at the place where you want your glossary. For example:

```
\documentclass{article}

\usepackage{glossaries}

\makenoidxglossaries % use TeX to sort

\newglossaryentry{potato}{name={potato},plural=
{potatoes},
 description={starchy tuber}}

\newglossaryentry{cabbage}{name={cabbage},
 description=
{vegetable with thick green or purple leaves}}

\newglossaryentry{turnip}{name={turnip},
 description={round pale root vegetable}}

\newglossaryentry{carrot}{name={carrot},
 description={orange root}}

\begin{document}
Chop the \gls{cabbage}, \glspl{potato} and \glspl
{carrot}.

\printnoidxglossaries
```

```
\end{document}
```

The \makenoidxglossaries method is very slow, uses an ASCII comparator and often breaks if there are commands in the name key. See Glossaries Performance for a comparison.

Try this out and run LaTeX (or pdfLaTeX) *twice*. The first run won't show the glossary. It will only appear on the second run. This doesn't include "turnip" in the glossary because that term hasn't been used (with commands like \gls{turnip}) in the document.

The glossary has a vertical gap between the "carrot" term and the "potato" term. This is because the entries in the glossaries are grouped according to their first letter. If you don't want this gap, just add nogroupskip to the package options:

```
\usepackage[nogroupskip]{glossaries}
```

or you may want to try out a style that shows the group headings:

```
\usepackage[style=indexgroup]{glossaries}
```

If you try out this example you may also notice that the description is followed by a full stop (period) and a number. The number is the location in the document where the entry was used (page 1 in this case), so you can lookup the term in the glossary and be directed to the relevant pages. It may be that you don't want this back-reference, in which case you can suppress it using the nonumberlist package option:

```
\usepackage[nonumberlist]{glossaries}
```

If you don't like the terminating full stop, you can suppress that with the nopostdot package option:

```
\usepackage[nopostdot]{glossaries}
```

If you try out the earlier example with glossaries-extra and \printunsrtglossaries you may notice that the terminating full stop is missing and there are no number lists. You can add the full stop back with

```
\usepackage[nopostdot=false]{glossaries-extra}
```

or

```
\usepackage[postdot]{glossaries-extra}
```

If you want the number lists then you need to use an indexing option.

You may have noticed that I've used another command in the above examples: `\glspl`. This displays the plural form. By default, this is just the singular form with the letter "s" appended, but in the case of "potato" I had to specify the correct plural using the `plural` key.

As I mentioned earlier, using TEX to sort the entries is the simplest but least efficient method. If you have a large glossary or if your terms contain non-Latin or extended Latin characters, then you will have a much faster build time if you use `makeindex` (Option 2) or `xindy` (Option 3) or `bib2gls` (Option 4). If you are using extended Latin or non-Latin characters, then `xindy` or `bib2gls` are the recommended methods. These methods are described in more detail in §4.

The rest of this document briefly describes the main commands provided by the glossaries package. (Most of these are also available with glossaries−extra but may behave slightly differently.)

2 Defining Terms

When you use the glossaries package, you need to define glossary entries before you can reference them. This is best done in the document preamble, as shown in the earlier examples, or in a separate file that's input in the preamble.

These entries could be a word, phrase, abbreviation or symbol. They're usually accompanied by a description, which could be a short sentence or an in-depth explanation that spans multiple paragraphs. The simplest method of defining an entry is to use:

```
\newglossaryentry{⟨label⟩}{⟨key=value list⟩}
```

The two most important keys are `name` and `description`:

```
\newglossaryentry{⟨label⟩}
{
  name={⟨name⟩},
  description={⟨description⟩},
  ⟨other options⟩
}
```

where ⟨*label*⟩ is a unique label that identifies this entry. (Don't include the angle brackets ⟨ ⟩. They just indicate the parts of the code that you need to change when you use this command in your document.) The ⟨*name*⟩ is the word, phrase or symbol you are defining, and ⟨*description*⟩ is the description to be displayed in the glossary.

This command is a "short" command, which means that ⟨*description*⟩ can't contain a paragraph break. If you have a long description, you can instead use:

```
\longnewglossaryentry{⟨label⟩}{⟨key=value list⟩}{⟨description⟩}
```

In this case the `name` key is in the second argument but the description is supplied in the third argument instead of via a key.

```
\longnewglossaryentry{⟨label⟩}
{
  name={⟨name⟩},
  ⟨other options⟩
}
{⟨description⟩}
```

Examples:

1. Define the term "set" with the label `set`:

```
\newglossaryentry{set}
{
  name={set},
  description={a collection of objects}
}
```

2. Define the symbol ∅ with the label `emptyset`:

```
\newglossaryentry{emptyset}
{
  name={\ensuremath{\emptyset}},
  description={the empty set}
}
```

(This will also need a `sort` key if you use Options 1 or 3, see below.)

3. Define the phrase "Fish Age" with the label `fishage`:

```
\longnewglossaryentry{fishage}
{name={Fish Age}}
{%
  A common name for the Devonian geologic period
  spanning from the end of the Silurian Period to
  the beginning of the Carboniferous Period.

  This age was known for its remarkable variety of
  fish species.
}
```

(The percent character discards the end of line character that would otherwise cause an unwanted space to appear at the start of the description.)

4. If you are using UTF-8 characters with the inputenc package, make sure you have mfirstuc v2.08+ installed:

```
% mfirstuc v2.08+
\newglossaryentry{elite}
{
  name={élite},
  description={select group or class}
}
```

If you have an older version of mfirstuc then any initial character that is an extended Latin or non-Latin character must be grouped in order to work with sentence-casing commands, such as `\Gls`:

```
% mfirstuc v2.07 or older
\newglossaryentry{elite}
{
  name={{é}lite},
  description={select group or class}
}
```

Or

```
% mfirstuc v2.07 or older
\newglossaryentry{elite}
{
  name={{\'e}lite},
  description={select group or class}
}
```

If you use `bib2gls` with glossaries-extra then the terms must be defined in a `bib` file. For example:

```
% Encoding: UTF-8

@entry{set,
  name={set},
  description={a collection of objects}
}

@entry{emptyset,
  name={\ensuremath{\emptyset}},
  description={the empty set}
}

@entry{fishage,
  name={Fish Age},
  description=
{A common name for the Devonian geologic period
  spanning from the end of the Silurian Period to
  the beginning of the Carboniferous Period.

  This age was known for its remarkable variety of
  fish species.}
}

@entry{elite,
  name={élite},
  description={select group or class}
}
```

(The `bib` format doesn't allow spaces in labels so you can't have `fish age` as the label, but you can have `fish-age`.) This method requires glossaries-extra's `record` package option:

```
\usepackage[record]{glossaries-extra}
```

and the bib file is specified in the resource command. For example, if the bib file is called entries.bib then put the following line in the document preamble:

```
\GlsXtrLoadResources[src={entries}]
```

You can have a comma-separated list. For example, if you also have entries defined in the file entries2.bib:

```
\GlsXtrLoadResources[src={entries,entries2}]
```

There are other keys you can use when you define an entry. For example, the name key indicates how the term should appear in the list of entries (glossary), but if the term should appear differently when you reference it with \gls{⟨*label*⟩} in the document, you need to use the text key as well.

For example:

```
\newglossaryentry{latinalph}
{
  name={Latin Alphabet},
  text={Latin alphabet},
  description={alphabet consisting of the letters
  a, \ldots, z, A, \ldots, Z}
}
```

This will appear in the text as "Latin alphabet" but will be listed in the glossary as "Latin Alphabet". With bib2gls this entry is defined in the bib file as:

```
@entry{latinalph,
  name={Latin Alphabet},
  text={Latin alphabet},
  description={alphabet consisting of the letters
  a, \ldots, z, A, \ldots, Z}
}
```

Another commonly used key is plural for specifying the plural of the term. This defaults to the value of the text key with an "s" appended, but if this is incorrect, just use the plural key to override it:

```
\newglossaryentry{oesophagus}
{
  name={œsophagus},
  plural={œsophagi},
  description={canal from mouth to stomach}
}
```

Abbreviations can be defined using:

```
\newacronym[⟨options⟩]{⟨label⟩}{⟨short⟩}{⟨long⟩}
```

where ⟨*label*⟩ is the label (as per `\newglossaryentry`), ⟨*short*⟩ is the short form and ⟨*long*⟩ is the long form. For example, the following defines an abbreviation:

```
\newacronym{svm}{SVM}{support vector machine}
```

This internally uses `\newglossaryentry` to define an entry with the label `svm`. By default, the `name` key is set to ⟨*short*⟩ ("SVM" in the above example) and the `description` key is set to ⟨*long*⟩ ("support vector machine" in the above example). If, instead, you want to be able to specify your own description you can do this using the optional argument:

```
\newacronym
 [description=
{statistical pattern recognition technique}]
 {svm}{SVM}{support vector machine}
```

Before you define your acronyms, you need to specify which style to use with:

```
\setacronymstyle[⟨glossary-type⟩]{⟨style-name⟩}
```

where ⟨*style-name*⟩ is the name of the style. There are a number of predefined styles, such as: long-short (on first use display the long form with the short form in parentheses); short-long (on first use display the short form with the long form in parentheses); long-short-desc (like long-short but you need to specify the description); or short-long-desc (like short-long but you need to specify the description). There are some other styles as well that use `\textsc` to typeset the acronym in small-caps or that use a footnote on first use. See the main user guide for further details.

The glossaries−extra package provides improved abbreviation handling with a lot more predefined styles.[1] With this extension package, abbreviations are defined using:

```
\newabbreviation[⟨options⟩]{⟨label⟩}{⟨short⟩}{⟨long⟩}
```

You can still use `\newacronym` but it's redefined to use the new abbreviation interface. The style must now be set using:

```
\setabbreviationstyle[⟨category⟩]{⟨style-name⟩}
```

The default ⟨*category*⟩ is `abbreviation`. If you use `\newacronym` the category is `acronym`, which is why you need to use the optional argument if you define abbreviations with `\newacronym` when glossaries−extra has been loaded:

```
\setabbreviationstyle[acronym]{⟨style name⟩}
```

If you use `bib2gls` then abbreviations are defined in the `bib` file in the format:

```
@abbreviation{⟨label⟩,
  long={long form},
  short={short form}
}
```

The plural forms for abbreviations can be specified using the `longplural` and `shortplural` keys. For example:

```
\newacronym
 [longplural={diagonal matrices}]
 {dm}{DM}{diagonal matrix}
```

or (with glossaries−extra):

```
\newabbreviation % glossaries-extra.sty
 [longplural={diagonal matrices}]
 {dm}{DM}{diagonal matrix}
```

If omitted, the defaults are again obtained by appending an "s" to the singular versions. (The glossaries−extra package provides a way of not appending "s" for abbreviation plurals via category attributes.) With `bib2gls`, the definition in the `bib` file is:

[1] `dickimaw-books.com/gallery/sample-abbr-styles.shtml`

```
@abbreviation{dm,
  short={DM},
  long={diagonal matrix},
  longplural={diagonal matrices}
}
```

It's also possible to have both a name and a corresponding symbol. Just use the `name` key for the name and the `symbol` key for the symbol. For example:

```
\newglossaryentry{emptyset}
{
  name={empty set},
  symbol={\ensuremath{\emptyset}},
  description={the set containing no elements}
}
```

or with `bib2gls` the definition in the `bib` file is:

```
@entry{emptyset,
  name={empty set},
  symbol={\ensuremath{\emptyset}},
  description={the set containing no elements}
}
```

If you want the symbol in the `name` field then you must supply a `sort` value with Options 1 and 3 otherwise you'll end up with errors from TEX or `xindy`. With Option 2 (`makeindex`) it's not quite so important but you may find the resulting order is a little odd. For example:

```
\newglossaryentry{emptyset}
{
  name={\ensuremath{\emptyset}},
  sort={empty set},
  description={the set containing no elements}
}
```

This displays the symbol as $\emptyset$ but sorts according to "empty set". You may want to consider using glossaries-extra's `symbols` package option which provides

\glsxtrnewsymbol[⟨key=value list⟩]{⟨label⟩}{⟨sym⟩}
requires \usepackage[symbols]{glossaries-extra}

This internally uses \newglossaryentry but automatically sets the sort key to the ⟨label⟩. For example:

```
\documentclass{article}
\usepackage[symbols]{glossaries-extra}
\makeglossaries
\glsxtrnew-
symbol % requires glossaries-extra.sty 'symbols' option
 [description={the set containing no elements}]
 {emptyset}% label (and sort value)
 {\ensuremath{\emptyset}}% symbol
\begin{document}
\gls{emptyset}
\printglossaries
\end{document}
```

Now the sort value is set to the label "emptyset".

With bib2gls you can define this entry in the bib file as

```
@entry{emptyset,
  name={\ensuremath{\emptyset}},
  description={the set containing no elements}
}
```

in which case bib2gls will try to interpret the name field to determine the sort value. Alternatively you can use:

```
@symbol{emptyset,
  name={\ensuremath{\emptyset}},
  description={the set containing no elements}
}
```

which will use the label (emptyset) as the sort value. (You don't need the symbols package option in this case, unless you want a separate symbols list.) The corresponding document (where the definition is in the file entries.bib) is now:

```
\documentclass{article}
\usepackage[record]{glossaries-extra}
\GlsXtrLoadResources[src={entries}]
\begin{document}
\gls{emptyset}
\printunsrtglossaries
\end{document}
```

Note that while the `sort` key is advised for symbols when using `\makeglossaries` or `\makenoidxglossaries` it shouldn't be used with `bib2gls`. Instead, `bib2gls` has its own algorithm for determining the sort value based on the entry type (`@entry`, `@symbol` etc). See bib2gls gallery: sorting[2] for further details.

3 Using Entries

Once you have defined your entries, as described above, you can reference them in your document. There are a number of commands to do this, but the most common one is:

`\gls[⟨options⟩]{⟨label⟩}[⟨insert⟩]` *modifiers:* * +

where ⟨*label*⟩ is the label you assigned to the entry when you defined it. For example, `\gls{fishage}` will display "Fish Age" in the text (given the definition from the previous section). If you are using `bib2gls` then this will display `??` (like `\ref` and `\cite`) until `bib2gls` has created the relevant files and LaTeX is rerun.

If you are using the hyperref package (remember to load it before glossaries) `\gls` will create a hyperlink to the corresponding entry in the glossary. If you want to suppress the hyperlink for a particular instance, use the starred form `\gls*` for example, `\gls*{fishage}`. The other commands described in this section all have a similar starred form.

If the entry was defined as an acronym (using `\newacronym` with glossaries described above) or an abbreviation (using `\newabbreviation` with glossaries−extra), then `\gls` will display the full form the first time it's used (first use) and just the short form on subsequent use. For example, if the style is set to long−short, then `\gls{svm}` will display "support vector machine (SVM)" the first time it's used, but the next occurrence of `\gls{svm}` will just display "SVM". (If you use `\newacronym` with glossaries−extra the default doesn't show the long form on first use. You'll need to change the style first, as described earlier.)

If you want the plural form, you can use:

`\glspl[⟨options⟩]{⟨label⟩}[⟨insert⟩]` *modifiers:* * +

[2] `dickimaw-books.com/gallery/index.php?label=bib2gls-sorting`

instead of \gls{⟨label⟩}. For example, \glspl{set} displays “sets”.

If the term appears at the start of a sentence, you can convert the first letter to uppercase (sentence case) using:

\Gls[⟨options⟩]{⟨label⟩}[⟨insert⟩] *modifiers:* * +

for the singular form or

\Glspl[⟨options⟩]{⟨label⟩}[⟨insert⟩] *modifiers:* * +

for the plural form. For example:

```
\Glspl{set} are collections.
```

produces “Sets are collections”.

If you’ve specified a symbol using the symbol key, you can display it using:

\glssymbol[⟨options⟩]{⟨label⟩}[⟨insert⟩] *modifiers:* * +

For example

```
\documentclass{article}
\usepackage{glossaries}
\newglossaryentry{emptyset}
{
  name={empty set},
  symbol={\ensuremath{\emptyset}},
  description={the set containing no elements}
}
\begin{document}
The \gls{emptyset} is denoted \glssymbol{emptyset}.
\end{document}
```

The empty set is denoted ∅.

4 Displaying a List of Entries

In §1, I mentioned that there are three options you can choose from to create an automatically sorted glossary with the base glossaries package. These are also available with the extension package glossaries−extra along with a fourth option. These four options are listed below in a little more detail. Table 1 summarises the main advantages and disadvantages. (There's a more detailed summary in the main glossaries user manual.) See also Incorporating makeglossaries or makeglossaries-lite or bib2gls into the document build.[3]

Table 1: Comparison of Glossary Options

	Option 1	**Option 2**	**Option 3**	**Option 4**
Requires glossaries−extra?	✘	✘	✘	✔
Requires an external application?	✘	✔	✔	✔
Requires Perl?	✘	✘	✔	✘
Requires Java?	✘	✘	✘	✔
Can sort extended Latin or non-Latin alphabets?	✘	✘	✔	✔
Efficient sort algorithm?	✘	✔	✔	✔
Can use different sort methods for each glossary?	✔	✘	✘	✔
Any problematic sort values?	✔	✔	✔	✘
Can form ranges in the location lists?	✘	✔	✔	✔
Can have non-standard locations?	✔	✘	✔†	✔

†Requires some setting up.

Option 1 ("noidx")

This is the simplest option but it's slow and if you want a sorted list, it doesn't work for extended or non-Latin alphabets. The `name` mustn't contain commands (or, if it does, the `sort` value must be supplied) unless you have the package option `sanitizesort` or `sort=def` or `sort=use`.

1. Add `\makenoidxglossaries` to your preamble (before you start defining your entries, as described in §2).
2. Put

```
\printnoidxglossary[sort=⟨order⟩,⟨other options⟩]
```

[3] dickimaw-books.com/latex/buildglossaries/

where you want your list of entries to appear. The sort ⟨*order*⟩ may be one of: `word` (word ordering), `letter` (letter ordering), `case` (case-sensitive letter ordering), `def` (in order of definition) or `use` (in order of use). Alternatively, use

```
\printnoidxglossaries
```

to display all your glossaries (if you have more than one). This command doesn't have any arguments.

This option allows you to have different sort methods. For example:

```
\printnoidxglossary[sort=word]% main glossary
\printnoidxglossary[type=
symbols,% symbols glossary
 sort=use]
```

3. Run LaTeX twice on your document. (As you would do to make a table of contents appear.) For example, click twice on the "typeset" or "build" or "PDFLaTeX" button in your editor.

Here's a complete document (`myDoc.tex`):

```
\documentclass{article}

\usepackage{glossaries}

\makenoidxglossaries

\newglossaryentry{sample}{name={sample},
  description={an example}}

\begin{document}
A \gls{sample}.

\printnoidx-
glossaries % iterate over all indexed entries
\end{document}
```

Document build:

```
pdflatex myDoc
pdflatex myDoc
```

Option 2 (`makeindex`)

This option uses an application called `makeindex` to sort the entries. This application comes with all modern TEX distributions, but it's hard-coded for the non-extended Latin alphabet. This process involves making LATEX write the glossary information to a temporary file which `makeindex` reads. Then `makeindex` writes a new file containing the code to typeset the glossary. LATEX then reads this file on the next run. The `makeindex` application is automatically invoked by the helper `makeglossaries` script, which works out all the appropriate settings from the `aux` file.

1. If you are using a package that makes the double-quote character `"` a shorthand (an active character), then use `\GlsSetQuote` to change this to some other character. For example:

   ```
   \GlsSetQuote{+}
   ```

   Use this as soon as possible after you've loaded the glossaries package. (This may not be necessary if you define all your entries in the preamble.)

2. Add `\makeglossaries` to your preamble (before you start defining your entries).

3. Put

   ```
   \printglossary[⟨options⟩]
   ```

   where you want your list of entries (glossary) to appear. (The `sort` key isn't available in ⟨*options*⟩.) Alternatively, use

   ```
   \printglossaries
   ```

   which will display all glossaries (if you have more than one). This command doesn't have any arguments.

   All glossaries are sorted using the same method which may be identified with one of the package options: `sort=standard` (default), `sort=use` or `sort=def`.

4. Run LaTeX on your document. This creates files with the extensions `glo` and `ist` (for example, if your LaTeX document is called `myDoc.tex`, then you'll have two extra files called `myDoc.glo` and `myDoc.ist`). If you look at your document at this point, you won't see the glossary as it hasn't been created yet.

5. Run `makeglossaries` with the base name of your document (without the `tex` extension). If you have access to a terminal or a command prompt then you need to run the command:

```
makeglossaries myDoc
```

(Replace `myDoc` with the base name of your LaTeX document file without the extension. Avoid spaces in the file name.) If you don't have Perl installed use `makeglossaries-lite` instead:

```
makeglossaries-lite myDoc
```

> Some beginners get confused by `makeglossaries` the application (run as a system command) and `\makeglossaries` the LaTeX command which should be typed in the document preamble. These are two different concepts that happen to have similar looking names.

If you don't know how to use the command prompt, then you can probably configure your text editor to add `makeglossaries` (or `makeglossaries-lite`) as a build tool, but each editor has a different method of doing this, so I can't give a general description. However, there are some guidelines in Incorporating makeglossaries or makeglossaries-lite or bib2gls into the document build.[4] If you still have problems, try adding the `automake` package option:

```
\usepackage[automake]{glossaries}
```

The default sort is word order ("sea lion" comes before "seal"). If you want letter ordering you need to add the `order=letter` package option

```
\usepackage[order=letter]{glossaries}
```

6. Once you have successfully completed the previous step, you can now run LaTeX on your document again.

[4] `dickimaw-books.com/latex/buildglossaries/`

Here's a complete document (`myDoc.tex`):

```
\documentclass{article}

\usepackage{glossaries}

\makeglossaries % create makeindex files

\newglossaryentry{sample}{name={sample},
  description={an example}}

\begin{document}
A \gls{sample}.

\print-
glossaries % input files created by makeindex
\end{document}
```

Document build:

```
pdflatex myDoc
makeglossaries myDoc
pdflatex myDoc
```

or

```
pdflatex myDoc
makeglossaries-lite myDoc
pdflatex myDoc
```

Option 3 (`xindy`)

This option uses an application called `xindy` to sort the entries. This application is more flexible than `makeindex` and is able to sort extended Latin or non-Latin alphabets. It comes with both TeX Live and MiKTeX. Since `xindy` is a Perl script, you will also need to ensure that Perl is installed. In a similar way to Option 2, this option involves making LaTeX write the glossary information to a temporary file which `xindy` reads. Then `xindy` writes a new file containing the code to typeset the glossary. LaTeX then reads this file on the next run. The `xindy` application is automatically invoked by the helper `makeglossaries` script, which works out all the appropriate settings from the `aux` file.

1. Add the `xindy` option to the glossaries package option list:

```
\usepackage[xindy]{glossaries}
```

If you aren't using a Latin script, you may need to suppress the default number group:

```
\usepackage[xindy={glsnumbers=false}]
{glossaries}
```

2. Add `\makeglossaries` to your preamble (before you start defining your entries).
3. Put

```
\printglossary[⟨options⟩]
```

where you want your list of entries (glossary) to appear. (The `sort` key isn't available in ⟨*options*⟩.) Alternatively, use

```
\printglossaries
```

All glossaries are sorted using the same method which may be identified with one of the package options: `sort=standard` (default), `sort=use` or `sort=def`.

4. Run LaTeX on your document. This creates files with the extensions `glo` and `xdy` (for example, if your LaTeX document is called `myDoc.tex`, then you'll have two extra files called `myDoc.glo` and `myDoc.xdy`). If you look at your document at this point, you won't see the glossary as it hasn't been created yet.
5. Run `makeglossaries` with the base name of the document (omitting the `tex` extension). If you have access to a terminal or a command prompt then you need to run the command:

```
makeglossaries myDoc
```

(Replace `myDoc` with the base name of your LaTeX document file without the `tex` extension.) Avoid spaces in the file name. If you don't know how to use the command prompt, then as mentioned above, you may be able to configure your text editor to add `makeglossaries` as a build tool. Note that the `automake` option won't work in TeX's restricted mode, as `xindy` isn't on the list of trusted applications.

The default sort is word order ("sea lion" comes before "seal"). If you want letter ordering you need to add the `order=letter` package option:

```
\usepackage[xindy,order=letter]{glossaries}
```

6. Once you have successfully completed the previous step, you can now run LaTeX on your document again.

Here's a complete document (`myDoc.tex`):

```
\documentclass{article}

\usepackage[xindy]{glossaries}

\makeglossaries % create xindy files

\newglossaryentry{sample}{name={sample},
  description={an example}}

\begin{document}
A \gls{sample}.

\printglossaries % input files created by xindy
\end{document}
```

Document build:

```
pdflatex myDoc
makeglossaries myDoc
pdflatex myDoc
```

Option 4 (`bib2gls`)

This requires the extension package glossaries-extra and an application called `bib2gls`. This application is able to sort extended Latin or non-Latin alphabets. It comes with both TeX Live and MiKTeX but requires at least Java 8. This method works differently to Options 2 and 3. Instead of creating a file containing the code to typeset the glossary it creates a `glstex` file containing the entry definitions fetched from the `bib` file (or files), but only those entries that are required in the document are defined and they are defined in the order obtained from the chosen sort method. This means that you can just use `\printunsrtglossary` to display each glossary (or `\printunsrtglossaries` to display them all).

1. Add the `record` option to the glossaries-extra package option list:

```
\usepackage[record]{glossaries-extra}
```

2. Add one or more

```
\GlsXtrLoadResources[src={⟨bib list⟩},⟨options⟩]
```

to your preamble where ⟨*bib list*⟩ is the list of `bib` files containing the entries. You may use different sort methods for each resource set. For example:

```
\usepackage[record,% using bib2gls
 abbreviations,% create abbreviations list
 symbols,% create symbols list
 numbers% create numbers list
]{glossaries-extra}

\GlsXtrLoadResources[
  src={terms},% entries in terms.bib
  % put these entries in the 'main' (default) list:
  type=main,
  sort=de-CH-
1996% sort according to this locale
]
\GlsXtrLoadResources[
  src={abbrvs},% entries in abbrvs.bib
  % put these entries in the 'abbreviations' list:
  type={abbreviations},
  % case-sensitive letter (non-locale) sort:
  sort=letter-case
]
\GlsXtrLoadResources[
  src={syms},% entries in syms.bib
  type=
symbols,% put these entries in the 'symbols' list
  sort=
use% sort according to first use in the document
]
\GlsXtrLoadResources[
  src={constants},% entries in constants.bib
  type=
```

```
numbers,% put these entries in the 'numbers' list
  sort-field=
user1,% sort according to this field
  sort=double% double-precision sort
]
```

The last resource set assumes that the entries defined in the file `constants.bib` have a number stored in the `user1` field. For example:

```
@number{pi,
  name={\ensuremath{\pi}},
  description={pi},
  user1={3.141592654}
}
```

3. Put

```
\printunsrtglossary[type=⟨type⟩,⟨options⟩]
```

where you want your list of entries (glossary) to appear. (The `sort` key isn't available in ⟨*options*⟩. The `sort` setting needs to be used in `\GlsXtrLoadResources` instead.) Alternatively, use

```
\printunsrtglossaries
```

4. Run LaTeX on your document. The `record` option adds information to the `aux` file that provides `bib2gls` with all required details for each resource set. For example, if the file is called `myDoc.tex`:

```
pdflatex myDoc
```

5. Run `bib2gls`

```
bib2gls myDoc
```

or (if you need letter groups)

```
bib2gls --group myDoc
```

6. Run LaTeX again.

Here's a complete document (`myDoc.tex`):

```
\documentclass{article}

\usepackage[record]{glossaries-extra}
% input the glstex file created by bib2gls:
\GlsXtrLoadResources
 [% instructions to bib2gls:
   src={entries}
, % terms are defined in entries.bib
   sort=en-GB% sort according to this locale
 ]

\begin{document}
A \gls{sample}.

\printunsrt-
glossaries % iterate over all defined entries
\end{document}
```

The accompanying `entries.bib` file:

```
@entry{sample,
  name={sample},
  description={an example}
}
```

Document build:

```
pdflatex myDoc
bib2gls myDoc
pdflatex myDoc
```

If you are having difficulty integrating `makeglossaries` (or `makeglossaries-lite`) or `bib2gls` into your document build process, you may want to consider using `arara`, which is a Java application that searches the document for special comment lines that tell `arara` which applications to run. For example, the file `myDoc.tex` might start with:

```
% arara: pdflatex
% arara: makeglossaries
% arara: pdflatex
\documentclass{article}
\usepackage{glossaries}
\makeglossaries
```

then to build the document you just need the single system call:

```
arara myDoc
```

Alternatively, if you want to use `makeglossaries-lite`, change the second line to:

```
% arara: makeglossarieslite
```

There's also a rule for `bib2gls`. For example, the following indicates that letter groups are required:

```
% arara: pdflatex
% arara: bib2gls: { group: on }
% arara: pdflatex
\documentclass{article}
\usepackage[record]{glossaries-extra}
\GlsXtrLoadResources
```

When sorting the entries, the string comparisons are made according to each entry's `sort` key. If this is omitted, the `name` key is used. For example, consider the definition:

```
\newglossaryentry{elite}
{
  name={\'elite},
  description={select group or class}
}
```

The `sort` key isn't present, so it's set to the same as the `name` key: `\'elite`. How this is interpreted depends on which option you have used:

Option 1 By default, the accent command will be stripped so the sort value will be `elite`. This will put the entry in the "E" letter group. However if you use the `sanitizesort=true` package option, the sort value will be interpreted as the sequence of characters:

`\ ' e l i t` and `e`. This will place this entry in the "symbols" group since it starts with a symbol.

Option 2 The sort value will be interpreted as the sequence of characters: `\ ' e l i t` and `e`. The first character is a backslash so `makeindex` will put this entry in the "symbols" group.

Option 3 `xindy` disregards LaTeX commands so it sorts on `elite`, which puts this entry in the "E" group. If stripping all commands leads to an empty string (such as would happen with `\ensuremath{\emptyset}`) then `xindy` will fail, so in those situations you need to provide an appropriate `sort` value that `xindy` will accept.

`xindy` merges entries with duplicate sort values. `xindy` forbids empty sort values. A sort value may degrade into an empty or duplicate value once `xindy` has stripped all commands and braces.

Option 4 `bib2gls` has a primitive LaTeX parser that recognises a limited set of commands, which includes the standard accent commands and some maths commands, so it can convert `\'elite` to `élite`. It disregards unknown commands. This may lead to an empty sort value, but `bib2gls` doesn't mind that. (It has fallbacks, depending on the sort method and various settings, that can be used to determine the order if the sort value is empty or a duplicate.)

Note that even if the name is given as `\'elite`, the letter group heading (if the `--group` switch is used) may end up with the character É depending on the locale used by the sort comparator. In this case you will need to ensure the document can support this character either with inputenc or by switching to a LaTeX engine with native UTF-8 support. (Modern LaTeX kernels default to UTF-8.)

There's more information on how `bib2gls` obtains the sort value in bib2gls gallery: sorting.[5]

If the inputenc package is used:

```
\usepackage[utf8]{inputenc}
```

and the entry is defined as:

[5] `dickimaw-books.com/gallery/index.php?label=label=bib2gls-sorting`

```
\newglossaryentry{elite}
{
  name={élite},
  description={select group or class}
}
```

then:

Option 1: With old LaTeX kernels, this entry was placed in the "E" letter group. With new LaTeX kernels you will have to set the `sort` key to Basic Latin (for example, `sort={elite}`) but, where possible, it's better to use `xindy` or `bib2gls`.

Option 2 `makeindex` sees é as two octets (0xC3 0xA9) rather than a single character so it tries to put `élite` in the 0xC3 ("Ã") letter group (which, in this case, comes after "Z"). You will either have to set the `sort` key to Basic Latin (for example, `sort={elite}`) or switch to `xindy` or `bib2gls`.

Option 3 `xindy` will correctly recognise the sort value `élite` and will place it in whatever letter group is appropriate for the given language setting. (In English, this would just be the "E" letter group, but another language might put it in the "É" letter group.)

Option 4 The inputenc package doesn't affect the encoding used with `bib` entry definitions, since these are dependent on the encoding used to save the `bib` file. The `glstex` file created by `bib2gls` will be written in the encoding required by your document. (In general, it's best to use the same encoding across all files.)

You can help `bib2gls` by putting an encoding comment at the start of the `bib` file:

```
% Encoding: UTF-8
```

With the correct encoding set up, `bib2gls` will determine that the sort value is `élite` and will place it in whatever letter group is appropriate for the given sort rule. For example, `sort=en-GB` (or just `sort=en`) will put `élite` in the "E" letter group, but another language might put it in the "É" letter group.

Therefore if you have extended Latin or non-Latin characters, your best option is to use either `xindy` (Option 3) or `bib2gls` (Option 4). If you use `makeindex` (Option 2) you need to specify the `sort` key like this:

```
\newglossaryentry{elite}
{
  name={élite},
  sort={elite},
```

```
  description={select group or class}
}
```

If you use Option 1, you may or may not need to use the `sort` key, but you will need to be careful about fragile commands in the `name` key if you don't set the `sort` key.

If you use Option 3 and the `name` only contains a command or commands (such as `\P` or `\ensuremath{\pi}`) you must add the `sort` key. This is also advisable for the other options (except Option 4), but is essential for Option 3. For example:

```
\newglossaryentry{P}{name={\P},sort={P},
  description={paragraph symbol}}
```

5 Customising the Glossary

The default glossary style uses the description environment to display the entry list. Each entry name is set in the optional argument of `\item` which means that it will typically be displayed in bold. You can switch to medium weight by redefining `\glsnamefont`:

```
\renewcommand*{\glsnamefont}[1]{\textmd{#1}}
```

Some classes and packages redefine the description environment in such as way that's incompatible with the glossaries package. In which case you'll need to select a different glossary style (see below).

By default, a full stop is appended to the description (unless you use glossaries−extra). To prevent this from happening use the `nopostdot` package option:

```
\usepackage[nopostdot]{glossaries}
```

or to add it with glossaries−extra:

```
\usepackage[postdot]{glossaries-extra}
```

By default, a location list is displayed for each entry (unless you use `\printunsrtglossary` without `bib2gls`). This refers to the document locations (for example, the page number) where the entry has been referenced. If you use Options 2 or 3 described in §4 or Option 4 (with `bib2gls` and glossaries−extra) then location ranges will be compressed. For example, if an entry was used on pages 1, 2 and 3, with Options 2, 3 or 4 the location list will appear as 1–3,

but with Option 1 it will appear as 1, 2, 3. If you don't want the locations displayed you can hide them using the nonumberlist package option:

```
\usepackage[nonumberlist]{glossaries}
```

or with bib2gls use save-locations=false in the optional argument of the appropriate \GlsXtrLoadResources (it's possible to have some resource sets with locations and some without).

Entries are grouped according to the first letter of each entry's sort key. By default a vertical gap is placed between letter groups for most of the predefined styles. You can suppress this with the nogroupskip package option:

```
\usepackage[nogroupskip]{glossaries}
```

If the default style doesn't suit your document, you can change the style using:

```
\setglossarystyle{⟨style name⟩}
```

There are a number of predefined styles.[6] Glossaries can vary from a list of symbols with a terse description to a list of words or phrases with descriptions that span multiple paragraphs, so there's no "one style fits all" solution. You need to choose a style that suits your document. For example:

```
\setglossarystyle{index}
```

You can also use the style package option for the preloaded styles. For example:

```
\usepackage[style=index]{glossaries}
```

Examples:

1. You have entries where the name is a symbol and the description is a brief phrase or short sentence. Try one of the "mcol" styles defined in the glossary−mcols package. For example:

```
\usepackage[nopostdot]{glossaries}
\usepackage{glossary-mcols}
\setglossarystyle{mcolindex}
```

[6] dickimaw-books.com/gallery/glossaries-styles/

or

```
\usepackage[stylemods=mcols,style=mcolindex]
{glossaries-extra}
```

2. You have entries where the name is a word or phrase and the description spans multiple paragraphs. Try one of the "altlist" styles. For example:

```
\usepackage[nopostdot]{glossaries}
\setglossarystyle{altlist}
```

or

```
\usepackage[stylemods,style=altlist]{glossaries-
extra}
```

3. You have entries where the name is a single word, the description is brief, and an associated symbol has been set. Use one of the styles that display the symbol (not all of them do). For example, one of the tabular styles:

```
\usepackage[nopostdot,nonumberlist,style=
long4col]glossaries
```

or one of the "tree" styles:

```
\usepackage[nopostdot,nonumberlist,style=tree]
{glossaries}
```

If your glossary consists of a list of abbreviations and you also want to specify a description as well as the long form, then you need to use an abbreviation style that will suit the glossary style. For example, use the long-short-desc acronym style:

```
\setacronymstyle{long-short-desc}
```

Define the acronyms with a description:

```
\newacronym
 [description=
{statistical pattern recognition technique}]
 {svm}{SVM}{support vector machine}
```

Alternatively with glossaries−extra:

```
\setabbreviationstyle{long-short-desc}

\newabbreviation
 [description=
{statistical pattern recognition technique}]
 {svm}{SVM}{support vector machine}
```

Choose a glossary style that suits wide entry names. For example:

```
\setglossarystyle{altlist}
```

6 Multiple Glossaries

The glossaries package predefines a default `main` glossary. When you define an entry (using one of the commands described in §2), that entry is automatically assigned to the default glossary, unless you indicate otherwise using the `type` key. However you first need to make sure the desired glossary has been defined. This is done using:

\newglossary[⟨*log-ext*⟩]{⟨*glossary-label*⟩}{⟨*out-ext*⟩}{⟨*in-ext*⟩}{⟨*title*⟩}

The ⟨*glossary-label*⟩ is a label that uniquely identifies this new glossary. As with other types of identifying labels, be careful not to use active characters in ⟨*label*⟩. The final argument ⟨*title*⟩ is the section or chapter title used by `\printglossary`, `\printnoidxglossary` or `\printunsrtglossary`. The other arguments indicate the file extensions used by `makeindex` or `xindy` (described in §4). If you're not using either `makeindex` or `xindy`, then the ⟨*log-ext*⟩, ⟨*in-ext*⟩ and ⟨*out-ext*⟩ arguments aren't relevant, in which case you may prefer to use the starred version where those arguments are omitted:

```
\newglossary*{⟨glossary-label⟩}{⟨title⟩}[⟨counter⟩]
```

In the case of Options 2 or 3, all new glossaries must be defined before `\makeglossaries`. (*Entry* definitions should come after `\makeglossaries`.) In the case of Option 4, all new glossaries must be defined before any `\GlsXtrLoadResources` that requires them.

Since it's quite common for documents to have both a list of terms and a list of abbreviations, the glossaries package provides the package option `acronyms` (or `acronym`), which is a convenient shortcut for

```
\newglossary[alg]{acronym}{acr}{acn}{\acronymname}
```

The option also changes the behaviour of `\newacronym` so that acronyms are automatically put in the list of acronyms instead of the main glossary. The glossaries−extra package also supports the `acronyms` option for abbreviations defined using `\newacronym` but additionally has the package option `abbreviations` to create a list of abbreviations for `\newabbreviation`.

There are some other package options for creating commonly used lists: `symbols` (lists of symbols), `numbers` (lists of numbers), `index` (an index). Since indexes don't typically have descriptions, the `index` option also defines:

```
\newterm[⟨key=value list⟩]{⟨entry-label⟩}
                                        requires index package option
```

This is just a shortcut that uses `\newglossaryentry` with the `name` set to ⟨*entry-label*⟩ and the `description` is suppressed.

For example, suppose you want a main glossary for terms, a list of acronyms and a list of notation:

```
\usepackage[acronyms]{glossaries}
\newglossary[nlg]{notation}{not}{ntn}{Notation}
```

After `\makeglossaries` (or `\makenoidxglossaries`) you can define the entries in the preamble. For example:

```
\newglossaryentry{gls:set}
{% This entry goes in the `main' glossary
  name={set},
  description={A collection of distinct objects}
```

```
}

% This entry goes in the `acronym' glossary:
\newacronym{svm}{svm}{support vector machine}

\newglossaryentry{not:set}
{% This entry goes in the `notation' glossary:
  type={notation},
  name={\ensuremath{\mathcal{S}}},
  description={A set},
  sort={S}}
```

or if you don't like using `\ensuremath`:

```
\newglossaryentry{not:set}
{% This entry goes in the `notation' glossary:
  type={notation},
  name={$\mathcal{S}$},
  text={\mathcal{S}},
  description={A set},
  sort={S}
}
```

Each glossary is displayed using:

```
\printnoidxglossary[type=⟨type⟩]
```

(Option 1) or

```
\printglossary[type=⟨type⟩]
```

(Options 2 and 3). Where ⟨*type*⟩ is the glossary label. If the type is omitted the default `main` glossary is assumed.

If you're using `bib2gls` then each glossary is displayed using:

```
\printunsrtglossary[type=⟨type⟩]
```

With this method you don't use `\makeglossaries` or `\makenoidxglossaries`. Instead you can assign the entry type with the resource command. For example:

```
\usepackage[record,abbreviations,symbols]
{glossaries-extra}

\GlsXtrLoadResources[
 src={terms}, % entries defined in terms.bib
 type=main% put in main glossary
]
\GlsXtrLoadResources[
 src={abbrvs}, % entries defined in abbrvs.bib
 type=abbreviations% put in abbreviations glossary
]
\GlsXtrLoadResources[
 src={syms}, % entries defined in syms.bib
 type=symbols% put in symbols glossary
]
```

Later in the document:

```
\printunsrtglossary % main
\printunsrtglossary[type=abbreviations]
\printunsrtglossary[type=symbols]
```

There's a convenient shortcut that will display all the defined glossaries depending on the indexing method:

```
\printnoidxglossaries
```

(Option 1) or

```
\printglossaries
```

(Options 2 and 3) or (glossaries−extra only)

```
\printunsrtglossaries
```

If you use Options 1 or 4, you don't need to do anything different for a document with multiple glossaries. If you use Options 2 or 3 with the `makeglossaries` Perl script or the `makeglossaries-lite` Lua script, you similarly don't need to do anything different to the document build (compared to building a document with only one glossary).

If you use Options 2 or 3 without the `makeglossaries` Perl script or `makeglossaries-lite` Lua script then you need to make sure you run `makeindex`/`xindy` *for each defined glossary*. The ⟨*gls*⟩ and ⟨*glo*⟩ arguments of `\newglossary` specify the file extensions to use instead of `gls` and `glo`. The optional argument ⟨*glg*⟩ is the file extension for the transcript file. This should be different for each glossary in case you need to check for `makeindex`/`xindy` errors or warnings if things go wrong.

For example, suppose you have three glossaries in your document (`main`, `acronym` and `notation`), specified using:

```
\usepackage[acronyms]{glossaries}
\newglossary[nlg]{notation}{not}{ntn}{Notation}
```

Then (assuming your LaTeX document is in a file called `myDoc.tex`):

Option 2: Either use one `makeglossaries` or `makeglossaries-lite` call:

```
makeglossaries myDoc
```

or

```
makeglossaries-lite myDoc
```

Or you need to run `makeindex` three times:

```
makeindex -t myDoc.glg -s myDoc.ist -o myDoc.gls
myDoc.glo
makeindex -t myDoc.alg -s myDoc.ist -o myDoc.acr
myDoc.acn
makeindex -t myDoc.nlg -s myDoc.ist -o myDoc.not
myDoc.ntn
```

Option 3: Either use one `makeglossaries` call:

```
makeglossaries myDoc
```

Or you need to run `xindy` three times (be careful not to insert line breaks where the line has wrapped.)

```
xindy -L english -C utf8 -I xindy -M myDoc -t
myDoc.glg -o myDoc.gls myDoc.glo
xindy -L english -C utf8 -I xindy -M myDoc -t
myDoc.alg -o myDoc.acr myDoc.acn
xindy -L english -C utf8 -I xindy -M myDoc -t
myDoc.nlg -o myDoc.not myDoc.ntn
```

Option 4: With `bib2gls` only one call is required:

```
pdflatex myDoc
bib2gls --group myDoc
pdflatex myDoc
```

(Omit `--group` if you don't need letter groups.)

7 Hyperlinks (glossaries and hyperref)

Take care if you use the glossaries package with hyperref. Contrary to the usual advice that hyperref should be loaded last, glossaries (and glossaries-extra) must be loaded *after* hyperref:

```
\usepackage[colorlinks]{hyperref}
\usepackage{glossaries}
```

If you use hyperref make sure you use pdfLaTeX rather than the LaTeX to DVI engine. The DVI format can't break hyperlinks across a line so long glossary entries (such as the full form of acronyms) won't line wrap with the DVI engine. Also, hyperlinks in sub- or superscripts aren't correctly sized with the DVI format.

By default, if the hyperref package has been loaded, commands like `\gls` will form a hyperlink to the relevant entry in the glossary. If you want to disable this for *all* your glossaries, then use:

```
\glsdisablehyper
```

If you want hyperlinks suppressed for entries in specific glossaries, then use the `nohypertypes` package option. For example, if you don't want hyperlinks for entries in the `acronym` and `notation` glossaries but you do want them for entries in the `main` glossary, then do:

```
\usepackage[colorlinks]{hyperref}
\usepackage[acronym,nohypertypes={acronym,notation}]
{glossaries}
\newglossary[nlg]{notation}{not}{ntn}{Notation}
```

If you want the hyperlinks suppressed the first time an entry is used, but you want hyperlinks for subsequence references then use the `hyperfirst=false` package option:

```
\usepackage[colorlinks]{hyperref}
\usepackage[hyperfirst=false]{glossaries}
```

The glossaries−extra extension package provides another method using category attributes. See the glossaries−extra user manual for further details.

Take care not to use non-expandable commands in PDF bookmarks. This isn't specific to the glossaries package but is a limitation of PDF bookmarks. Non-expandable commands include commands like `\gls`, `\glspl`, `\Gls` and `\Glspl`. The hyperref package provides a way of specifying alternative text for the PDF bookmarks via `\texorpdfstring`. For example:

```
\section{The \texorpdfstring{\gls{fishage}}
{Fish Age}}
```

However, it's not a good idea to use commands like `\gls` in a section heading as you'll end up with the table of contents page in your location list and it will unset the first use flag too soon. Instead you can use

```
\glsentrytext{⟨entry-label⟩}
```

This is expandable provided that the `text` key doesn't contain non-expandable code. For example, the following works:

```
\section{The \glsentrytext{fishage}}
```

and it doesn't put the table of contents in the location list.

If you use glossaries−extra then use the commands that are provided specifically for use in section headers. For example:

```
\section{The \glsfmttext{fishage}}
```

8 Cross-References

You can add a reference to another entry in a location list using the `see={`⟨*label-list*⟩`}` key when you define an entry. The referenced entry (or entries) must also be defined.

For example:

```
\longnewglossaryentry{devonian}{name={Devonian}}%
{%
  The geologic period spanning from the end of the
  Silurian Period to the beginning of the Carboniferous Period.

  This age was known for its remarkable variety of
  fish species.
}

\newglossaryentry{fishage}
{
  name={Fish Age},
  description={Common name for the Devonian period},
  see={devonian}
}
```

The cross-reference will appear as "*see* Devonian". You can change the "see" tag for an individual entry using the format `see={[`⟨*tag*⟩`]`⟨*label-list*⟩`}`. For example:

```
\newglossaryentry{latinalph}
{
  name={Latin alphabet},
  description={alphabet consisting of the letters
  a, \ldots, z, A, \ldots, Z},
  see=[see also]{exlatinalph}
}
\newglossaryentry{exlatinalph}
{
   name={extended Latin alphabet},
   description=
{The Latin alphabet extended to include
   other letters such as ligatures or diacritics.}
}
```

In the above, I haven't enclosed the entire value of the `see` key in braces. If you use the `see` key in an optional argument, such as the optional argument of `\newacronym`, make sure you

enclose the value (including the optional tag) in braces. For example:

```
\newacronym{ksvm}{ksvm}
{kernel support vector machine}
\newacronym
 [see={[see also]{ksvm}}]
 {svm}{svm}{support vector machine}
```

The glossaries-extra package provides a `seealso` key. This doesn't allow a tag but behaves much like `see={[\seealsoname]{`⟨*label-list*⟩`}}`. For example:

```
\newabbreviation{ksvm}{ksvm}
{kernel support vector machine}
\newabbreviation
 [seealso={ksvm}]
 {svm}{svm}{support vector machine}
```

Since the cross-reference appears in the location list, if you suppress the location list using the `nonumberlist` package option, then the cross-reference will also be suppressed. With `bib2gls`, don't use the `nonumberlist` package option. Instead use `save-locations=false` in the resource options. For example:

```
\usepackage[record,abbreviations,symbols]
{glossaries-extra}

\GlsXtrLoadResources[
 src={terms}, % entries defined in terms.bib
 type=main% put in main glossary
]
\GlsXtrLoadResources[
 src={abbrvs}, % entries defined in abbrvs.bib
 type=abbreviations,% put in abbreviations glossary
 save-locations=
false% no number list for these entries
]
\GlsXtrLoadResources[
 src={syms}, % entries defined in syms.bib
 type=symbols% put in symbols glossary
]
```

9 Further Information

- glossaries-extra and `bib2gls`: an introductory guide.
- The main glossaries user manual (`glossaries-user.pdf`).
- The glossaries FAQ.
- Incorporating makeglossaries or makeglossaries-lite or bib2gls into the document build.
- The glossaries-extra package.
- The `bib2gls` application.

The Dickimaw Books Gallery[7] provides additional example documents.

Symbols

Symbol	Description
	The syntax and usage of a command, environment or option etc.
	An important message.
	LaTeX code to insert into your document.
	Problematic code which should be avoided.
	How the example code should appear in the PDF.
`>_`	A command-line application invocation that needs to be entered into a terminal or command prompt.

Glossary

First use

The first time an entry is used by a command that unsets the first use flag (or the first time since the flag was reset).

First use flag

A conditional that keeps track of whether or not an entry has been referenced by any of the `\gls`-like commands (which can adjust their behaviour according to whether or not this flag is true). The conditional is true if the entry hasn't been used by one of these commands (or if the flag has been reset) and false if it has been used (or if the flag has been unset).

[7] `dickimaw-books.com/gallery`

Glossary

Technically a glossary is an alphabetical list of words relating to a particular topic. For the purposes of describing the glossaries and glossaries−extra packages, a glossary is either the list produced by commands like `\printglossary` or `\printunsrtglossary` (which may or may not be ordered alphabetically) or a glossary is a set of entry labels where the set is identified by the glossary label or type.

`\gls`-like

Commands like `\gls` that change the first use flag. These commands index the entry (if indexing is enabled), create a hyperlink to the entry's glossary listing (if enabled) and unset the first use flag.

Indexing (or recording)

The process of saving the location (for example, the page number) and any associated information that is required in the glossary. The data may be sorted and collated by an indexing application as part of the document build.

Link text

The text produced by commands like `\gls` that have the potential to be a hyperlink.

Semantic command

Essentially, a semantic command is one that's associated with a particular document element, idea or topic that hides the font and other stylistic formatting inside its definition. For example, Latin taxonomy is usually displayed in italic. Explicitly using font commands, for example `\textit{Clostridium}`, is syntactic markup. Whereas defining a command called, say, `\bacteria` that displays its argument in italics is a semantic command. The actual styling is hidden and the command relates specifically to a particular concept.

```
Syntactic: \textit{Clostridium}

\newrobustcmd*{\bacteria}[1]{\emph{#1}}%
Semantic: \bacteria{Clostridium}
```

The end result is the same:

Syntactic: *Clostridium*
Semantic: *Clostridium*

The advantage with semantic commands is that it's much easier to change the style, simply by adjusting the command definition. Note that I've used `\newrobustcmd` to make the semantic command robust as the style commands can cause a problem if they expand too soon.

Subsequent use

Using an entry that unsets the first use flag when it has already been unset.

Command Summary

A

\acronymname *initial:* Acronyms glossaries
(language-sensitive)

Expands to the title of the acronym glossary.

G

\Gls [⟨*options*⟩] { ⟨*label*⟩ } [⟨*insert*⟩] *modifiers:* * + glossaries §3; 21

As \gls but converts the first character of the link text to uppercase (for the start of a sentence) using \makefirstuc.

\gls [⟨*options*⟩] { ⟨*label*⟩ } [⟨*insert*⟩] *modifiers:* * + glossaries §3; 20

References the entry identified by ⟨*label*⟩. The text produced may vary depending on whether or not this is the first use.

\glsabbrvonlyfont { ⟨*text*⟩ } glossaries−extra v1.17+

Short form font used by the “only” abbreviation styles.

\glsabbrvscfont { ⟨*text*⟩ } glossaries−extra v1.17+

Short form font used by the small-caps “sc” abbreviation styles.

\glsdefaulttype *initial:* main glossaries

Expands to the label of the default glossary.

\glsdisablehyper glossaries §7; 43

Suppresses all glossary related hyperlinks.

\glsentrylong{⟨*entry-label*⟩} glossaries

Simply expands to the value of the `long` field. Does nothing if the entry hasn't been defined. May be used in expandable contexts provided that the `long` field doesn't contain any fragile commands.

\glsentryshort{⟨*entry-label*⟩} glossaries

Simply expands to the value of the `short` field. Does nothing if the entry hasn't been defined. May be used in expandable contexts provided that the `short` field doesn't contain any fragile commands.

\glsentrytext{⟨*entry-label*⟩} glossaries

§7; 44

Simply expands to the value of the `text` field. Does nothing if the entry hasn't been defined. May be used in expandable contexts provided that the `text` field doesn't contain any fragile commands.

\glsfmtshort{⟨*entry-label*⟩}

For use within captions or section titles to display the formatted short form.

\glsfmttext{⟨*entry-label*⟩}

For use within captions or section titles to display the formatted `text`.

\glslongonlyfont{⟨*text*⟩} glossaries−extra v1.17+

Long form font used by the "only" abbreviation styles.

\glslowercase{⟨*text*⟩} glossaries v4.50+

Converts ⟨*text*⟩ to lowercase using the modern LaTeX3 case-changing command, which is expandable.

\glsnamefont { ⟨*text*⟩ } glossaries

Used within the predefined glossary styles to apply a font change to the `name`.

\glsnoexpandfields glossaries

Don't expand field values when defining entries, except for those that explicitly have expansion enabled.

\Glspl [⟨*options*⟩] { ⟨*label*⟩ } [⟨*insert*⟩] *modifiers:* * + glossaries §3; 21

As `\Gls` but uses the plural form.

\glspl [⟨*options*⟩] { ⟨*label*⟩ } [⟨*insert*⟩] *modifiers:* * + glossaries §3; 20

As `\gls` but uses the plural form.

\GlsSetQuote { ⟨*character*⟩ } glossaries v4.24+

Set `makeindex`'s quote character to ⟨*character*⟩.

\glssymbol [⟨*options*⟩] { ⟨*label*⟩ } [⟨*insert*⟩] *modifiers:* * + §3; 21

References the entry identified by ⟨*label*⟩. The text produced is obtained from the `symbol` value. The ⟨*insert*⟩ argument will be inserted at the end of the link text. This command does not alter or depend on the first use flag.

\GlsXtrLoadResources [⟨*options*⟩] glossaries−extra v1.11+

For use with `bib2gls`, this both sets up the resource options (which `bib2gls` can detect from the `aux` file) and inputs the `glstex` file created by `bib2gls`.

\glsxtrnewsymbol [⟨*key=value list*⟩] {⟨*label*⟩} {⟨*sym*⟩} glossaries−extra
(requires \usepackage[symbols]{glossaries-extra})

§2; 19

Defines a new glossary entry with the given label, type set to symbols, the category set to symbol, the name set to ⟨*sym*⟩ and the sort set to ⟨*label*⟩. The optional argument is a comma-separated list of glossary entry keys, which can be used to override the defaults.

L

\loadglsentries [⟨*type*⟩] {⟨*filename*⟩} glossaries

Locally assigns \glsdefaulttype to ⟨*type*⟩ and inputs ⟨*filename*⟩. If the optional argument is omitted, the default glossary is assumed. Note that if any entries within ⟨*filename*⟩ have the type key set (including implicitly in commands like \newacronym), then this will override the type given in the optional argument.

\longnewglossaryentry {⟨*label*⟩} {⟨*key=value list*⟩} {⟨*description*⟩}
glossaries

§2; 12

Defines a new glossary entry with the given label. The second argument is a comma-separated list of glossary entry keys. The third argument is the description, which may include paragraph breaks.

M

\makefirstuc {⟨*text*⟩} mfirstuc

Robust command that converts the first character of ⟨*text*⟩ to uppercase (sentence case). See the mfirstuc documentation for further details, either:

```
texdoc mfirstuc
```

or visit ctan.org/pkg/mfirstuc.

\makeglossaries glossaries

Opens the associated glossary files that need to be processed by makeindex or xindy.

\makenoidxglossaries glossaries v4.04+

Sets up all glossaries so that they can be displayed with \printnoidxglossary.

N

\newabbreviation [⟨*options*⟩] {⟨*label*⟩} {⟨*short*⟩} {⟨*long*⟩} glossaries−extra §2; 17

Defines a new entry that represents an abbreviation. This internally uses \newglossaryentry and any provided ⟨*options*⟩ (glossary entry keys) will be appended. The category is set to abbreviation by default, but may be overridden in ⟨*options*⟩. The appropriate style should be set before the abbreviation is defined with \setabbreviationstyle.

\newacronym [⟨*options*⟩] {⟨*label*⟩} {⟨*short*⟩} {⟨*long*⟩} glossaries §2; 16

This command is provided by the base glossaries package but is redefined by glossaries−extra to use \newabbreviation with the category key set to acronym. With just the base glossaries package, use \setacronymstyle to set the style. With glossaries−extra, use \setabbreviationstyle[acronym]{⟨*style*⟩} to set the style that governs \newacronym.

\newglossary [⟨*log-ext*⟩] {⟨*glossary-label*⟩} {⟨*out-ext*⟩} {⟨*in-ext*⟩} {⟨*title*⟩}
glossaries §6; 38

Defines a glossary identified by ⟨*glossary-label*⟩ (which can be referenced by the type key when defining an entry).

\newglossary* {⟨*glossary-label*⟩} {⟨*title*⟩} [⟨*counter*⟩] glossaries v4.08+ §6; 39

A shortcut that supplies file extensions based on the glossary label:

\newglossary[⟨*glossary-label*⟩-glg]{⟨*glossary-label*⟩}{⟨*glossary-label*⟩-gls}{⟨*glossary-label*⟩-glo}{⟨*title*⟩}[⟨*counter*⟩]

\newglossaryentry{⟨*label*⟩}{⟨*key=value list*⟩} glossaries §2; 11

Defines a new glossary entry with the given label. The second argument is a comma-separated list of glossary entry keys.

\newterm[⟨*key=value list*⟩]{⟨*entry-label*⟩} (requires `index` package option) §6; 39

Defines a new glossary entry with the given label, `type` set to `index`, the `name` set to ⟨*entry-label*⟩ and the `description` set to `\nopostdesc`. The optional argument is a comma-separated list of glossary entry keys, which can be used to override the defaults.

\nopostdesc glossaries v1.17+

When placed at the end of the `description`, this switches off the post-description punctuation (if it has been enabled). Does nothing outside of the glossary.

P

\printglossaries glossaries §6; 41

Iterates over all glossaries and does `\printglossary[type=`⟨*type*⟩`]` for each glossary.

\printglossary[⟨*options*⟩] glossaries

Displays the glossary by inputting a file created by `makeindex` or `xindy`. Must be used with `\makeglossaries` and either `makeindex` or `xindy`.

\printnoidxglossaries glossaries v4.04+ §6; 41

Iterates over all glossaries and does `\printnoidxglossary[type=`⟨*type*⟩`]` for each glossary.

\printnoidxglossary[⟨*options*⟩] glossaries v4.04+

Displays the glossary by obtaining the indexing information from the `aux` file and using TEX to

sort and collate. Must be used with `\makenoidxglossaries`. This method can be very slow and has limitations.

\printunsrtglossaries glossaries−extra v1.08+ §6; 41

Iterates over all glossaries and does `\printunsrtglossary[type=`⟨*type*⟩`]` for each glossary.

\printunsrtglossary [⟨*options*⟩] glossaries−extra v1.08+

Displays the glossary by iterating over all entries associated with the given glossary (in the order in which they were added to the glossary). The location lists and group headers will only be present if the associated fields have been set (typically by `bib2gls`).

S

\seealsoname *initial:* `see also` glossaries−extra
(language-sensitive)

Used as a cross-reference tag.

\setabbreviationstyle [⟨*category*⟩] {⟨*style-name*⟩} glossaries−extra §2; 17

Sets the current abbreviation style to ⟨*style-name*⟩ for the category identified by ⟨*category*⟩. If the optional argument is omitted, `abbreviation` is assumed.

\setacronymstyle [⟨*glossary-type*⟩] {⟨*style-name*⟩} glossaries §2; 16

Sets the acronym style. Don't use with glossaries−extra.

\setglossarystyle {⟨*style name*⟩} glossaries §5; 36

Set the current glossary style to ⟨*style name*⟩.

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