The selnolig package: Selective suppression of typographic ligatures*

Mico Loretan†

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Contents

*Current version: 0.151. Features of this package are subject to change without prior notice. The main text fonts used in the present user guide are "Garamond Premier Pro" (for the most part) and "EB Garamond" (for the parts that deal with the fb, fh, fk, ffb, ffh, and ffk ligatures), "common" and "discretionary" ligatures are enabled for both text fonts. Sans-serif text portions are typeset in "Helvetica Neue," and "Consolas" is used as the monospaced font.

†loretan dot mico at gmail dot com.

1 Introduction

The ability of TEX and Friends to use typographic ligatures has long been cherished by its users. Indeed, the automated and transparent use of typographic ligatures by TEX and Friends is often held up by their users as one of the reasons for using these programs.

However, even though the automatic use of typographic ligatures is very useful in general, there are words for which the use of certain typographic ligatures may not be appropriate. The TEXBook observes, on p. 19, that the word "shelfful" may look better if it is typeset as "shelfful", i.e., *without* the ff-ligature. Some other English-language words that would generally be considered to be good candidates for non-use of ligatures are cufflink and offload, compare their appearance with that of cufflink and offload. Observe that all of these words are composite, with the first word component (or morpheme) ending in an "f" or "ff" and the second component (morpheme) beginning with either an "f" (in the case of shelfful) or an "l" (in the cases of cufflink and offload). A morpheme,

briefly stated, is the smallest linguistic unit within a word that bears distinct meaning. Thus, the words shelfful and offload each contain two morphemes.

On the whole, though, the need to suppress typographic ligatures selectively for English language documents generally does not appear to be an enormously pressing concern, possibly because English doesn't feature composite words that frequently. However, in some other languages, such as German, composite words are much more common, in such languages, there is naturally a much greater potential for composite words to feature f-f, f-l, f-i and other such character pairs (and triples) at morpheme boundaries. In German typography, the use of ligatures across morpheme boundaries is considered something to be avoided at (nearly) all cost, probably because ligatures that span morphemes have the potential to impair seriously the intelligibility of these words.[1] Words such as kopflos and elffach (containing fl- and ff-ligatures) simply look wrong to a German reader, they should be typeset as kopflos and elffach, respectively.

TEX and Friends offer several methods for suppressing ligatures on a case-by-case basis.[2] However, these methods must be applied separately to each and every occurrence of all words that contain undesirable ligatures. As such, these methods are both time-intensive and tedious, and there's a residual risk that some words for which ligatures should be suppressed will be overlooked in the editing process.

What has *not* been available so far is a LATEX package that (i) specifies a list of word patterns and entire words for which ligatures should be suppressed and (ii) systematically discovers all instances of these words in a document and applies the non-ligation rules automatically. The selnolig package is meant to address this need. The package is currently set up to handle English and German language non-ligation issues by providing extensive lists of ligature suppression macros appropriate for the respective languages. Of course, no claim as to the completeness of either list is or can be made. The package therefore makes it easy for users to provide additional ligature suppression rules for words not already covered by the package.[3]

The selnolig package also provides additional hyphenation exception lists for both English and German language words. It is straightforward to extend the package to let it handle ligature suppression rules for other languages besides English and German.

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[1] For German texts, I believe that the *Duden* provides this sort of authoritative backing. For English texts, I'm actually not aware of a document issued by an official or quasi-official body that discourages the use of typographic ligatures across morpheme boundaries. If anybody can provide such a reference, I would be happy to list it.

[2] In LATEX, there are three basic methods for suppressing ligature within a character pair: (i) insertion of an "empty atom", `{}` between the characters, (ii) insertion of an explicit italic correction, `\/`, and (iii) insertion of an explicit "kern", e.g., `\kern0pt` or `\hspace{0pt}`. The babel package, when used with the `ngerman` option, offers the "shortcut" macro `"|` for this purpose. Note, though, that the first ligature suppression method, `{}`, does *not* work if the document is compiled with LuaLATEX.

[3] If you discover such words, please email them to me so that I can augment the package's ligature suppression rules appropriately. A suggested template for reporting such cases is provided in Appendix E.

For both English and German language documents, the selnolig package provides macrs to suppress selectively the following f-ligatures: ff, fi, fl, ffi, and ffl—the "standard" f-ligatures that should be familiar to most users of Computer Modern fonts—as well as the ft and fft ligatures. The latter two ligatures, while not provided by the Computer Modern font family, are available frequently in "oldstyle" or "Garalde" font families.

For English language documents, the package's default setting is to suppress f-ligatures for only a fairly basic set of words. However, by providing the option `broad-f`, additional f-ligatures can be suppressed, including for words that contain the fb, fh, fj, and fk character pairs. The package also recognizes an option called `hdlig` to suppress selectively historic and discretionary ligatures, such as those for the ct, st, sp, *th*, *et*, and *as* character pairs.

For German language documents, all instances of fb, fh, fj, and fk ligatures are suppressed globally, see Section 7.5. However, exceptions are provided in order *not* to suppress these ligatures for selected words of non-German origin such as fjord, fjell, Kafka, and Prokofjew. At this time, no macros for the selective suppression of historic and/or discretionary ligatures are provided for German language documents.

Of course, if the fonts you employ for your documents do not provide these typographic ligatures, the presence of the ligature suppression rules will have no effect—other than to slow down compilation speed.

A comment on the classification of various forms of typographic ligatures. Among the ligature-rich OpenType fonts I'm familiar with that can be loaded via the fontspec package under LuaLaTeX, there appears to a near-complete lack of terminological consistency as to which typographic ligatures—beyond the so-called "common" ligatures (mainly f-ligatures)—are labelled "historic" and which ones are labelled "discretionary." For instance, the fonts Latin Modern Roman, EB Garamond 12 Regular, Garamond Premier Pro, and Hoefler Text report having "only" discretionary ligatures, whereas Junicode, Cardo, and Palatino Linotype report featuring both historic and discretionary ligatures.[4] To simplify terminology, the selnolig package provides the `hdlig` option to enable ligature suppression rules that could apply to either the "historic" or the "discretionary" groups of ligatures.

2 I'm in a hurry! How do I start using this package?

2.1 How do I load the selnolig package?

- If your document is in English and you want to suppress f-ligatures for a "basic" set of words and word patterns, you should load the package as follows:

```
\usepackage[english]{selnolig}
```

[4] Separately, none of these fonts reports having ligatures classified as either "contextual" or "required".

Synonymous options for `english` are `UKenglish`, `british`, `USenglish`, `american`, `canadian`, `australian`, and `newzealand`.

  - If you want to load a broader set of f-ligature suppression rules than the set that's enabled by default, be sure to also specify the `broad-f` option, see Section 6.2.1.
  - If the font you use for your document also provides "historic" and/or "discretionary" ligatures (e.g., ct, st, sp, *th*, *as*, *is*, *us*, etc.), you should also specify the `hdlig` option (in addition to the `english` option, of course) when loading the selnolig package.[5]

- If your document is written in German, load the package as follows:

  ```
  \usepackage[ngerman]{selnolig}
  ```

  Synonymous options for `ngerman` are `german`, `austrian`, `naustrian`, `swissgerman`, and `swiss`.

- If you load the package *without* an explicit language option, i.e., as

  ```
  \usepackage{selnolig}
  ```

  but if one or more of the language options noted above are specified as options to the `\documentclass` instruction, LaTeX will pass these options on to the selnolig package.

- If no language options are set, either when the package is loaded or as options in the `\documentclass` instruction, loading the selnolig package will have no effect on the appearance of your document—unless you specify various `\nolig` macros on your own.

2.2 Any hints on how to get started with LuaLaTeX?

The selnolig package requires LuaLaTeX—it will *not* work with either pdfLaTeX or XeLaTeX. This requirement will likely force you to make some changes to the preambles of your existing LaTeX files in order to make them compilable by LuaLaTeX. The main changes you must apply are: (i) remove (or comment out) any `\usepackage{inputenc}` instructions that may be present, and (ii) insert the instruction

```
\usepackage{fontspec}
```

[5] If the selnolig package is loaded *after* the fontspec package, a macro is run to inquire if historic and/or discretionary ligatures are enabled; if the answer is yes, the `hdlig` option is enabled automatically.

in the preamble.

Of course, you'll also need to use a TEX distribution that includes a fairly recent version of LuaLATEX. TEXLive 2012, MacTEX 2012, and MiKTEX 2.9 all satisfy this requirement. If you use a command-line interface to compile your document named, say, `myfile.tex`, be sure to type

```
lualatex myfile
```

rather than either `latex myfile` or `pdflatex myfile`. If you use an editor with pull-down menus or buttons to invoke TEX, be sure to select `LuaLaTeX` rather than, say, `pdfLaTeX`. Be forewarned that the first time you run LuaLATEX on your document with a new set of fonts, the compilation speed may be quite slow because LuaLATEX has to build various cache files for font-related information. Subsequent compilation runs should be much faster.

Depending on your TEX distribution, the default font family used by LuaLATEX will be either Computer Modern or Latin Modern. If you wish to use a different font family, further instructions will be required. How to specify fonts and font families and how to set up various font-related options in LuaLATEX are subjects that lie far beyond the scope of this user guide. I urge you to become familiar with the user guide of the fontspec package to learn how to control a multitude of font-related options. The answers to the question Frequently loaded packages: Differences between pdfLATEX and LuaLATEX?, posted on tex.stackexchange.com, contain some very useful information as well. An additional great resource for users who would like to become more familiar with LuaLATEX is A Guide to LuaLATEX by Manuel Pégourié-Gonnard.

2.3 Anything else I need do to get started?

For multilingual support, LuaLATEXand the selnolig package work just fine with the babel package. This is in contrast to XELATEX, which requires the use of the polyglossia package. If your document loads the babel package, be sure to load the selnolig package *after* the babel package, so that the additional hyphenation patterns provided by the selnolig package aren't overridden by any hyphenation settings provided by the babel package.

LuaLATEX natively supports the so-called UTF8 input encoding. The selnolig package assumes that users make full use of this feature. In particular, if your document is in German, it is assumed that all vowels with diereses (Umlaute) are entered as ä, ö, and ü rather than as `\"{a}`, `\"{o}`, and `\"{u}` (or, if you tend to use the babel "shortcuts", as `"a`, `"o`, and `"u`). Likewise, it's assumed that you enter the "Eszett" (*Scharfes S*) character as ß rather than as `\{ss}`.[6]

It is also assumed that you use the triple-f (modern) spelling form for words such as `Schifffahrt`, `Stofffarbe`, and `grifffest`.

[6] Actually, the use of the input characters with "built-in" diereses is required only for the operations of the package's `\nolig` and `\keeplig` commands.

Finally, if any babel-style "| ligature-suppressing shortcuts are present in your document, you should either remove them or replace them with `\breaklig` instructions. On my LuaLaTeX system (MacTeX 2012), whenever a "| command is encountered, a bad crash occurs that requires a reboot of the system.

3 Acknowledgments and license

I owe a huge intellectual and programming debt to Patrick Gundlach and Taco Hoekwater, who responded kindly and generously with detailed computer code to various queries I posted to tex.stackexchange.com.[7] Without their expertise in programming in lua and interfacing the lua code with LaTeX, this package would not exist. They certainly deserve most of the credit for the lua code used by the selnolig package.

Felix Lehmann (a linguist and expert in morphology, i.e., the study of morphemes) and Steffen Hildebrandt (computer scientist extraordinaire) served as patient and careful testers of several beta versions of this package, uncovering bugs, pointing out unclear passages in the user guide, and providing many excellent suggestions for important enhancements and other improvements. Steffen provided crucial modifications to the package's lua code to make possible the `\keeplig` macro. Equally importantly, Felix and Steffen created software to systematically and comprehensively test the package's German detection patterns for linguistic adequacy and (relative) completeness.

[Still to come: a brief statement what Felix and Steffen found, and a reference or two to their published work.] They wish to thank the Institut für Maschinelle Sprachverarbeitung at the Universität Stuttgart for granting them a license for the morphological analysis tool SMOR and, in particular, Helmut Schmid for his guidance, the Web-as-Corpus kool ynitiative (WaCky) for letting them use the SdeWaC corpus.[8] They also thank Rajesh Bhatt (University of Massachusetts–Amherst), Miriam Butt (Universität Konstanz), and Sabine Schulte im Walde (Universität Stuttgart) for helping them find the right resources for their project.

The rmligs script lists hundreds of German language words for which f-ligatures should be suppressed. I created many of the initial German language ligature suppression rules used in the selnolig package based on the words listed in the rmligs package.[9]

[7] See especially the questions http://tex.stackexchange.com/q/48516/5001, http://tex.stackexchange.com/q/63005/5001, and http://tex.stackexchange.com/q/37443/5001.

[8] M. Baroni, S. Bernardini, A. Ferraresi and E. Zanchetta, 2009, The WaCky Wide Web: A Collection of Very Large Linguistically Processed Web-Crawled Corpora. *Language Resources and Evaluation*, 43 (3): 209–226.

[9] All versions of rmligs are archived at http://www.j3e.de/ispell/igerman98/dict/. A slightly modified version of the rmligs package's test file, now called `rmligs-testfile.tex`, is included among the ancillary files distributed with the selnolig package.

Other contributors to tex.stackexchange.com and comp.text.tex, too numerous to name individually, also helped guide and influence the genesis of this package. To all of you, I express my sincere thanks.

The website http://www.morewords.com provides very convenient methods for searching English language words that may contain cases of ligature collisions across morpheme boundaries. For German words, the site http://corpora.informatik.uni-leipzig.de/?dict=de provides a similar resource.

The entire selnolig package is placed under the terms of the LaTeX Project Public License, version 1.3 or later (http://www.latex-project.org/lppl.txt). It has the status "maintained."

4 Structure of the package

The selnolig package has four main components:

- The main package file, selnolig.sty,
- lua code, contained in the file selnolig.lua, that provides low-level functions to set up the package's main user macros,
- extensive lists of non-ligation rules (applied to either words or word fragments) for English and German language documents, contained in separate .sty files, and
- a user guide (the document you're reading right now) and several ancillary files.

The selnolig package starts up as follows:

- The package's main file, called selnolig.sty, should be loaded in your document's preamble with a \usepackage statement with one or more options (see below). It is preferable that it be loaded *after* the fontspec package is loaded and any ligature-setting commands are executed.
- After setting up several Boolean switches designed to structure the processing of options, the package loads the file selnolig.lua, which contains the package's Lua code.
- Next, the package's three user macros are set up:

    1. The main user macro is called \nolig. Each \nolig instruction takes two arguments: a "search string" and a string that indicates the "insertion point" for the non-ligation "whatsit." For example, the macro

```
\nolig{lfful}{lf|ful}
```

serves to suppress automatically the ff-ligature in words such as "shelfful", "bookshelfful", and "selffulfilling". Note the use of the | symbol in the command's second argument to indicate which ligature should be suppressed. In principle, more than one ligature suppression point may be provided in the second argument of a `\nolig` instruction.

Observe also that the arguments of the `\nolig` command (as well as of the package's other user commands) are case-sensitive.

2. The macro

   ```
   \keeplig{<word-fragment>}
   ```

   lets users specify words and word fragments for which typographic ligatures should *not* be suppressed anywhere in the document. In a sense, it's the exact opposite command to the command `\nolig`.

   Having this command is very useful for several reasons, but mainly because it allows us specify simpler, i.e., less restrictive, `\nolig` instructions. To give an example: if the `ngerman` option is set, the package uses the macro

   ```
   \nolig{flich}{f|lich}
   ```

   to break up the fl-ligature in words such as brieflich, tariflich, trefflich, hilflich, verwerflich, beruflich, sträflich, höflich, glimpflich, unerschöpflich and vortrefflich—and probably quite a few more words too. However, this macro is a bit too broad because it also operates on words such as Pflicht and verpflichten, for which the fl-ligature should *not* be suppressed. Rather than provide a plethora of slightly narrower `\nolig` macros just to avoid operating on the Pflicht-words, the package simply provides the commands

   ```
   \keeplig{Pflicht}
   \keeplig{pflicht}
   ```

   to override the action of the `\nolig{flich}{f|lich}` instruction for all words that contain these word fragments.

3. The macro `\breaklig`, which doesn't take an argument, is provided as a hopefully easy-to-remember version of the low-level command `\hspace{0pt}`. As the name suggests, you should insert this macro in places where you want to break up a ligature on an ad-hoc basis. For instance, to suppress the *sk* ligature in the word `groundskeeper` on a one-off basis, one might enter it as "`grounds\breaklig keeper`" to get *groundſkeeper* rather than *groundskeeper*. (To suppress the *sk* ligature globally for this word as well as for words such as *greenskeeper* and *miskeep*, one could issue the directive `\nolig{skeep}{s|keep}`. The selnolig package does so.)

Note that no separate macro for ad-hoc disabling of `\nolig` macros is provided. There is no real need for a new macro of this type, I believe, as the LaTeX command `\mbox` is available for this purpose.

- The next few steps in the loading process depend on which language-related options are set:
  - If *no* language-specific options are in effect, the loading process terminates. Users may still use the `\nolig`, `\keeplig`, and `\breaklig` instructions, but no predefined lists of language-specific `\nolig` macros are loaded.
  - If the `english` option (or one of its synonymous options) is set, the files selnolig-english-patterns.sty and selnolig-english-hyphex.sty are loaded. The former file contains a long list of `\nolig` macros adapted to English language typographic usage, Appendix C provides a complete listing of these macros. The latter file contains a list of hyphenation exceptions, mainly for words that contain one or more potential non-ligation points and for which TeX's hypenation algorithm either misses valid hyphenation points or selects invalid hyphenation points, see Section 6.2.2 below.
  - If the `ngerman` option (or one of its synonymous options) is set, the files selnolig-german-patterns.sty and selnolig-german-hyphex.sty are loaded. The former file contains ligature-suppressing instructions appropriate for German typographic usage, Appendix D lists its contents. The latter file provides additional hyphenation rules for German-language words.
  - If the user specifies both the `english` and `ngerman` options (and or some of their synonymous options), *both* language-specific style files will be loaded. Under normal circumstances, a user will probably want to load only one or the other set of language-specific files, but not both sets.
- The source code of the user guide of this package (the document you're currently reading) is available in the file selnolig.tex.
- The files selnolig-english-test.tex and selnolig-german-test.tex load the selnolig package as well as either selnolig-english-wordlist.tex or selnolig-german-wordlist.tex. They serve to demonstrate the output of the selnolig package when run on lists of English or German words that are candidates for non-use of ligatures. The files selnolig-english-test.pdf and selnolig-german-test.pdf contain the results of compiling the test programs.[10]

[10] The two "test" files also load the package showhyphens to indicate automatically all instances where LuaLaTeX might insert hyphenation points.

5 The selnolig package's approach to breaking up ligatures

The `\nolig` macros provided in the files `selnolig-english-patterns.sty` (see Appendix C) and `selnolig-german-patterns.sty` (see Appendix D) are primarily designed to break up ligatures—mainly f-ligatures, but potentially other ligatures as well—across *morpheme* boundaries.

Issues of inappropriately ligating character pairs and triples across morpheme boundaries can occur

- if two independent or "main words" (Stammwörter) are joined together: rooftop/rooftop, newspaper/newspaper, Schilffeld/Schilffeld, Brieftaube/Brieftaube
- between a prefix and main word: mistrust/mistrust, display/display, aufleben/aufleben, auftun/auftun
- between a main word and a suffix: shelfful/shelfful, dwarflike/dwarflike, kopflos/kopflos, and höflich/höflich.

For German words, the following exceptions and adjustments apply:[11]

- Should the combination of a main word and suffix give rise to an fi or ffi ligature, this ligature is *not* suppressed. Examples: streifig and affig. However, the fi and ffi ligatures *are* suppressed if two main words are joined together: Schilfinsel, Zupfinstrument, and Baustoffingenieur.
- For some borderline cases involving an fl ligature at the boundary of a main word (Stammwort) and suffix, preference is given to how the syllables are pronounced and how a word would be hyphenated. For instance, the words teuflisch (devilish) and schweflig (sulfurous) have their fl ligatures suppressed even though the f and l characters belong to the same underlying morphemes, viz., Teuf(e)l and Schwef(e)l. For these words, the suffixes are -isch and -ig, respectively, rather than -lisch and -lig. Nevertheless, usage seems to be in such cases to follow the words' pronunciation and hyphenation patterns, resulting in a suppression of the f-l ligature. This rule also applies to the typesetting words such as knifflig (tricky) and mufflig (grouchy).
- If a word could terminate with an fl ligature even though the "l" technically belongs to a different morpheme (say, because of an abbreviation that's in effect), the fl ligature *is used*. E.g., one writes Aufl. and gefl. with an fl ligature (but, when spelled out: Auflage and gefällig[st]).

[11] These adjustments are culled from the rules stated in the *Duden* and various websites that have taken an interest in this subject.

- This rule also suggests that ft and fft ligatures are permitted in words such as geschärft, unbedarft, and erschafft, whereas they should be suppressed in words such as gestreifte, schlürfte, and raffte.

- Here's a case for which I have not yet found a clear rule on how to proceed. If a main word ends in "ft" (e.g., Luft and Saft) and is followed by a suffix that starts with an i, as in `saftig` and `luftig`, one could write saftig and luftig because the `ft` character pair belongs to a single morpheme, *or* one could give preference to the way the words are hyphenated and break up the ft-ligature to write saftig and luftig. For now, the selnolig package chooses the former option. I haven't found any clear references so far on how to treat this case. Expert help and guidance on this topic would be much appreciated.

6 Options that govern the package's behavior

6.1 Main language options

The selnolig package currently offers two main language-specific options:

- `english`, synonyms: `british`, `ukenglish`, `UKenglish`, `american`, `usenglish`, `USenglish`, `canadian`, `australian`, and `newzealand`.

- `ngerman`, synonyms: `german`, `austrian`, `naustrian`, `swiss`, and `swissgerman`.

These language options may be used either individually or jointly. Indeed, this package's user guide was compiled with both the `english` and `ngerman` options set.[12]

See Appendices C and D for the complete listings of the package's English and German language ligature suppression rules.

6.2 Other options

6.2.1 English language case: The `broad-f` and `hdlig` options

The ligature suppression patterns listed in Appendix C for English language words are grouped into four parts. The first two parts concern the suppression of various f-ligatures. Part 1 provides a fairly limited, or "basic", set of patterns that will always be executed, and Part 2 contains a broader set of ligation suppression rules that will be executed if the `broad-f` option is specified.

[12] The ligature suppression patterns for the English-language and German-language segments of the package do not conflict with each other. The only "overlapping" word in the two packages is "offload". (This word has apparently entered the German [!] vocabulary.)

For English-language documents, only a fairly small number of the f-ligature suppression rules is enabled by default, i.e., if the `broad-f` option is not enabled. Eliminating *all* f-ligatures that cross morpheme boundaries simply does not appear to be a major concern in English-language typography. Whereas many (maybe even most?) people would agree that it advisable not to use the ffi-ligature in words such as chaffinch and wolffish, and not to use the ffl-ligature in words such as scofflaw and offload, there appears to be far less of a perceived need to suppress the fi (ffi) ligature in the far more commonly occurring words that end in f (ff) followed by the -ing, -ish, -ier, -iest, -ily, and -iness particles.[13] The same goes for the fl (ffl) ligature in words that end in f (ff) followed by -ly.[14] That is why only a few f-ligature suppression macros are enabled by default if the `english` option is set. To enable the broader set of f-ligature suppression rules, users must set the `broad-f` option explicitly.

My choices regarding which f-ligature suppression rules belong to the "basic" and "broad" groups are almost entirely pragmatic. They are certainly not based on any overriding English-language typographic principles (which, possibly, don't even exist for the case at hand). However, if anyone happens to have a strong view on whether either *fewer* or *more* f-ligature suppression macros should be included in the "basic" group—especially if you can provide references to such discussions in learned circles—I would love to hear from you.

Part 3, which is enabled if the `hdlig` option is set, provides ligature suppression patterns for the *historic* (Adobe uses the term "quaint") ct, st, and sp ligaturesin words such as arctic, painstaking, display, and misplace. The sp ligature is also suppressed for words of Greek origin containing the `sph` character triple, such as atmosphere and hemisphere, because in these cases the `ph` character pair (which derives from the Greek letter ϕ, or φ) should not be obscured by the use of an sp ligature.

Setting the `hdlig` option also enables ligature suppression rules for additional "discretionary" ligatures such as *th*, *at*, and *et*. For instance, rules are provided to suppress these ligatures in words such as *lighthouse* and *pothole*, *aromatherapy* and *albatross*, and *ninety* and *nonetheless*.[15] Currently, ligature suppression rules are provided for the following discretionary ligatures: *th*, *at*, *et*, *as*, *is*, *us*, *sk*, *ll*, and *fr*. Part 4 of Appendix C lists these rules.

Part 4 of this file, which is also processed if the `hdlig` option is set, deals with cases where one discretionary typographic literature, say *as*, pre-empts the use of a typographic ligature, say *st* or *sp*, in words such as *fast*/*fast* and *clasp*/*clasp*. Note that the issue being addressed in this part is not that of a ligature crossing a morpheme boundary but of one typographic ligature pre-empting

[13] Examples of such words are surfing, oafish, leafier, goofiest, fluffily, and goofiness.

[14] Examples are aloofly and gruffly.

[15] Observe also that the words *aromatherapy* and *nonetheless* are cases where one discretionary ligature (*at* and *et*, resp.) can pre-empt the use of a subsequent, and possibly more desirable, ligature (here: *th*), *cf.* the appearance of *aromatherapy* and *nonetheless*. This issue is discussed in more detail in Section 7.6.

the use of a more appropriate or more important ligature. This issue is discussed in more detail in Section 7.6 below.

6.2.2 Additional hyphenation exception patterns

TEX's hyphenation algorithms are widely acknowledged to be very good. However, for the English language case at least, it tends to miss quite a few permissible hyphenation points when dealing with words that end in -fing, -ffing, -fier, -ffier, -fiest, -fless, -flike, etc. Hyphenation exception lists are provided in the files selnolig-english-hyphex.sty and selnolig-german-hyphex.sty, respectively, for English and German words.

The German-language hyphenation exception list is currently much the shorter of the two. This is because it is assumed that writers of German-language documents use the babel package with the `ngerman` option (or one of the synonymous options) set, doing so also loads specialized hyphenation patterns suitable for German text. The German hyphenation exception list of the selnolig package is set up to deal with a fairly short list of words for which I've noticed that babel's hyphenation algorithm throws errors, e.g., for words such as Kau-f-in-dex, Lau-f-in-dex, Schif-fer-b-art, Schil-fin-sel, and Schil-f-feld.

It is possible to instruct selnolig *not* to load these hyphenation exception lists. You may want to do so, say, if you must use UK-English hyphenation patterns and can't make use of US-English hyphenation patterns, which is what's provided by the package. To skip loading the additional hyphenation patterns, you need to specify the option `noadditionalhyphenationpatterns` when loading the selnolig package.[16]

As was already noted in Section 2.3, if you use the babel package with, say the `ngerman` option, be sure to load selnolig package *after* the babel package so that the additional hyphenation exception patterns aren't overridden by babel's settings.

Incidentally, if the files selnolig-english-hyphex.sty and selnolig-german-hyphex.sty are located in a directory that's in the search path of your TeX distribution, these packages may be loaded by users via the usual `\usepackage` statements without having to load the entire selnolig package.

6.2.3 Controlling how much is written to the `.log` file

By default, none of the inner workings of the selnolig package are written to the `.log` file. However, if you execute the command `\debugon`, detailed information about each pattern match that is encountered is written to the `.log` file. For instance, if the German word "Auflaufform"—which happens to have *two* f-ligatures that need to be suppressed—is encountered, the following lines are written to the `.log` file:

[16] I am obviously not trying to make it too easy to invoke this option ...

```
pattern match: Auflaufform - fform
pattern match: Auflaufform - flauf
Do ligature suppression for: Auflaufform
Match: fform
Position 9
Match: flauf
Position 5
Liga table: 00010001000
Inserting noliga whatsit before glyph: l
Inserting noliga whatsit before glyph: f
```

Note that the selnolig package lets two separate `\nolig` commands, one for the string `fform` and the other for the string `flauf`, operate concurrently on one word. Note also that executing `\debugon` will result in fairly copious amounts of information being written to the log file.

7 Further issues

7.1 Known bugs

Remark: The first four bugs in the following list may turn out to be related, i.e., may be caused by a single bug in the package's lua code.

1. The `\nolig` search-and-nolig-whatsit-insertion patterns do not appear to work properly on the final word in the argument of a command (e.g., `\footnote{}` and `\section{}`) *unless* that word (including any trailing punctuation mark) is followed by one or more space characters before the closing curly brace of the command's argument is encountered.

   For instance, the fl ligature in "kopflos" is not broken up by either `\footnote{kopflos.}` or `\section{Kopflosigkeit}`. The package does work as expected if the commands are modified to `\footnote{kopflos. }` and `\section{Kopflosigkeit }`.

2. The `\nolig` search-and-insert patterns also don't seem to work on words (including, if present, any trailing punctuation marks) that are followed immediately by a `%` (comment) character. The workaround is the same as for the preceding bug: be sure to leave one or more spaces between the word and the comment character.

3. If an item in an itemize or enumerate environment *ends* with a word containg a ligature that should be suppressed (plus, possibly, an associated punctuation mark)—i.e., if it is followed immediately by another `\item` directive or an `\end{itemize}` or `\end{enumerate}` statement—the ligature suppression again fails. The remedy in this circumstance is to leave

a blank line between the end of one `\item`'s content and the next `\item` instruction or the `\end{itemize}` or `\end{enumerate}` instruction.

4. If the final word (again, possibly, with an associated punctuation character) in a sentence immediately *prior* to the start of an enumerate, itemize, or other such environment contains a ligature that should be suppressed, the `\nolig` macro again will not work properly. The recommended remedy is to leave a blank line between that sentence and the start of the environment in question. Inserting an "invisible" instruction such as `\vphantom{x}` also works.

5. The `\nolig` search-and-insert operations currently don't work properly if the first part of the search string, i.e., the part *before* the `|` symbol, contains a character with an Umlaut (dieresis) or other diacritic.

6. I'm not sure if the following amounts to a bug or "just" a case of incompatibility between two packages. The selnolig package does not appear to interact well with the ngerman package—even though it interacts nicely with the babel package (with one or more of the `ngerman`, `german`, `austrian`, and `naustrian` options set.) However, unless someone can convince me that using the ngerman package is truly preferable to using the babel package with one of the available German-language options, I probably won't bother figuring out how to fix this incompatibility.

7.2 Composite words made up of two different sets of primitive words

More so in German than in English, there may be composite words which are made up of two different pairs of primitive words. For instance, the word `Saufladen` may be constructed as `Sauf-laden` or as `Sau-fladen`, and the word `Wachstube` could be constructed as `Wachs-tube` or as `Wach-stube`. In one case, using the fl and st ligatures would be wrong, in the other, using the ligatures would help greatly in indicating the intended meaning of the composite words.

It turns out that if the `ngerman` option is set and the babel package is loaded as well, the `selnolig` package will break up the fl ligature in `Saufladen` but not the st ligature in `Wachstube`, i.e., the words will be typeset as "Saufladen" and "Wachstube", respectively. If that's not what you want, you'll need to mark up the words explicitly, say as follows: `Sau\keeplig{fl}aden` and `Wachs\breaklig tube`. One could, of course, also insert explicit hyphen characters to indicate unambiguously the intended meanings.

7.3 Lists of words fitting German and English language non-ligation patterns

Extensive lists of German and English language words for which one or more ligatures should be suppressed are provided in the files selnolig-german-wordlist.tex and selnolig-english-wordlist.tex.

I started the list of German language words with the examples provided by the rmligs package, but have managed to come up with quite a few more words since starting to put together the selnolig package. Obviously, I can't and won't make a claim that either of these lists is complete. Suggestions for additional words are always welcome.

The files selnolig-german-test.tex and selnolig-english-text.tex are "driver programs" that load the selnolig package and then run it on the respective lists of German- and English-language words. To compile the driver programs, be sure to use LuaLaTeX.

7.4 How to provide additional ligature suppression patterns

As already noted, it's not possible to claim that the non-ligation search-and-insert patterns set up in selnolig-english-patterns.sty and selnolig-german-patterns.sty are complete (or, for that matter, ever will be entirely complete). If you come across words containg ligatures that ought to be suppressed but aren't caught by the rules set up by the package's files, it is straightforward to create one or more new non-ligation rules to deal with the cases you've discovered.

Suppose, say, that you're preparing a special edition of Thomas Mann's novel "Der Tod in Venedig" (using an Antiqua font since very few people nowadays can still read **blackletter** text with ease...) and notice that the selnolig package does not appear to include a macro to suppress the unwanted ffl-ligature in the word "inbegriffleitend".[17] To rectify this problem, while simultaneously creating a search pattern that will also catch cases of inappropriate ffl-ligatures in the (hopefully more common ...) words "Jugendtreffleiter" and "Kunststoffleitung", you could add the following `\nolig` macro to your document's preamble:

```
\nolig{ffleit}{ff|leit}
```

With this macro in place, the words will now be typeset as inbegriffleitend, Jugendtreffleiter, and Kunststoffleitung.[18]

7.5 How to use the selnolig package to suppress ligatures for certain character pairs *globally*

The main purpose of the selnolig package is, obviously, to disable certain ligatures selectively. However, it can also be used to suppress ligation globally for selected character pairs.[19]

[17] This word really does occur in the aforementioned novel!

[18] In fact, the file selnolig-german-patterns.sty provides the less-restrictive macro `\nolig{fleit}{f|leit}` to take care of these words as well as quite a few more. The case of the surname Kaltefleiter, for which use of the fl ligature is presumably correct, may be handled via an `\keeplig` macro.

[19] I first became aware of the potential need for such a feature after reading Frank Mittelbach's posting, Suppress certain ligatures generally, on `tex.stackexchange.com`.

Suppose, for instance, that you have a font that provides ligatures for the fb, fh, fj, and fk character pairs (as well as, possibly, the ffb, ffh, ffj, and ffk character triples). If you wanted to suppress the four former f-ligatures globally (and also break up the latter ligatures as ff-b, ff-h, ff-j, and ff-k, respectively), you could do so by issuing the following commands:

```
\nolig{fb}{f|b}
\nolig{fh}{f|h}
\nolig{fj}{f|j}
\nolig{fk}{f|k}
```

In fact, these commands are already included among the `\nolig` macros that are enabled if the package's `ngerman` option is set. This is done because I was unable to come up with a single instance of a *German* language word involving these character combinations that doesn't also involve a morpheme boundary collision.[20]

Of course, you may have some *non-German* language words in your document for which you would not necessarily want to suppress these ligatures. Suppose, say, that you need to typeset the name `Kafka` and do not wish to suppress the fk-ligature for this specific word. To override the global setting created by the `\nolig{fb}{f|b}` macro, you'll need to write each instance of this word as `Ka\mbox{fk}a` to generate Kafka. Alternatively—and this is the "solution" implemented by the selnolig package—one may provide suitable `\keeplig` macros to preserve the fk-ligature in names such as Kafka, Safka, Piefke, Potrafke, Sprafke, Shirafkan, and Tirafkan.

Or, suppose the selnolig package's `ngerman` option is enabled and your document features some words of *Nordic* origin containing the `fj` character pair, such as Sognefjord and Dovrefjell. Observe that because the `fj` character pair contained in these words does not span a morpheme boundary, the fj-ligature need not be broken up. To deal with this category of words, `\keeplig` macros are provided for words containing the particles fjord, fjell, fjäll, and fjör as well as for names such as Eefje, Sufjan, Prokofjew, and Astafjew.

7.6 What if one ligature pre-empts a subsequent, more appropriate ligature?

If a font provides many discretionary ligatures, the likelihood increases that the use of a ligature for the first two characters of a character *triple* might pre-empt the use of a more appropriate ligature for the last two characters of that triple.[21]

In this section, we examine the use of `\nolig` instructions to address this contingency, focusing on cases of *ſt*, *ſp*, *th*, and *ta* character pairs being preceded by character pairs (for which the font

[20] These four macros are also enabled if the selnolig package's `english` and `broad-f` options are set.

[21] To be sure, this issue is not limited to just "discretionary" ligatures, it can also occur with f-ligatures. Consider the `ffi` and `ffl` character triples, and suppose that a certain font provides ff, fi, and fl ligatures but no ffi and ffl ligatures. Left to its own devices, TEX would let the ff ligature pre-empt any trailing fi and fl ligatures, leading to typographically incorrect outcomes for words such as auffinden (better: auffinden) and Schaffleisch (better: Schaffleisch).

provides ligatures) that end in *s* or *t*, respectively. This focus is dictated largely by the discretionary ligatures provided by the text font used for this user guide (Garamond Premier Pro). Other ligature-rich fonts may provide further possibilities for one ligature inappropriately pre-empting that for a trailing character pair.[22]

7.6.1 Ligatures for *as*, *is*, and *us* that pre-empt an *st* ligature

Suppose that the text font in use provides ligatures for the *as*, *is*, and *us* character pairs as well as for the *st* character pair. By TeX's rules for forming typographic ligatures, words that contain the character *triples* `ast`, `ist`, or `ust` will see the first two characters ligated, pre-empting the use of a typographic ligature for the trailing *st* character pair. There are three separate reasons why this outcome may not be desirable.

First, given the rather distinctive look of the *st* ligature, the word `stochastic` may look a bit odd if the *st* ligature is used only once—*stochastic*—simply because the *as* ligature pre-empts the second *st* ligature, readers may prefer the look of *stochastic*. Second, non-use of the st/*st* ligature may be undesirable if the same word occurs twice and in close visual proximity, once set in the upright font shape—for which there are no ligatures for the `as`, `is`, and `us` character pairs, and hence for which the issue of ligature pre-emption doesn't arise—and once in italics: must vs. *must*, readers may prefer the look of must vs. *must*.[23] Third, there may be cases where an *as* ligature not only pre-empts a subsequent *st* ligature but also spans a morpheme boundary, as in the words *infrastructure* and *seastrand*.[24] For such words, the *as* ligature should probably be suppressed in any case to increase the words' legibility: *infrastructure* and *seastrand*.

If you employ these discretionary ligatures in your documents and if the package's `hdlig` option is set, it is assumed that you prefer giving preference to the distinctive-looking *st* ligature over *as*, *is*, and *us* ligatures. The following commands are therefore provided:[25]

[22] For the Garamond Premier Pro text font, I've discovered the following exception to the general rule that TEX always gives precedence to a ligature for the first two characters of a character triple: for the character triple `fis` (as in `fish` and `fist`), TEX gives preference to the trailing *is* ligature over the preceding *fi* ligature, causing these words to be typeset as *fish* and *fist*, respectively. Not having access to other fonts that provide both *fi* and *is* ligatures, I can't tell if is a conscious design feature or a bug. For now, the `selnolig` is set to override this behavior, i.e., to always give preference to the *fi* ligature over the trailing *is* ligature for words that contain the strings `fish` and `fist`, hence, they'll be rendered as *fish* and *fist*, respectively.

[23] For afficionados of these discretionary ligatures: Do you like the look of *Do fast festive fists foster fustiness?*, or do you prefer the look of *Do fast festive fists foster fustiness?*

[24] This case was already noted in Footnote 21, where two words are noted for which the ff-ligature, which might improperly pre-empt fi- and fl-ligatures, happens to span a morpheme boundary.

[25] Be aware, though, that the second of these three commands, while correct for most words that contain the string `ist`, unnecessarily suppresses the *is* ligature for words where the *st* character pair crosses a morpheme boundary. Examples of this case are words that start with *dis-t…*—e.g., *distend, distribute, distrust, disturb*—or with *mis-t…*—e.g., *mistake, mistranslate, mistype*. (Note that the st/*st* ligature is already—and appropriately!—suppressed for these words.) At this time there are no plans to address this (overall minor?) problem.

```
\nolig{ast}{a|st}
\nolig{ist}{i|st}
\nolig{ust}{u|st}
```

7.6.2 Ligatures for *as*, *is*, and *us* that pre-empt an *sp* ligature

The same three reasons for not letting *as*, *is*, and *us* ligatures pre-empt an *st* ligature also apply to the case of the equally distinctive looking *sp* ligature. The selnolig package therefore provides macros to ensure the use of the trailing *sp* ligature in words such as *clasp*, *hasp*, *hispanic*, *raspberry*, *teaspoon*, *wasp*, *crisp*, *lisp*, *whisper*, *wispy*, and *cusp*.

7.6.3 Ligatures for *at* and *et* that pre-empt a *th* ligature

Suppose that a font provides ligatures for the *at*, *et*, and *th* character pairs. By TEX's rules for forming ligatures, without special intervention the word `mathematics` will be typeset as *mathematics* rather than as *mathematics* because the *at* ligature pre-empts use of the *th* ligature. The same happens for words such as *bath*, *Kathryn*, and *pathology*.[26] Given the prevalence and distinctive pronuciation of the `th` character pair in the English language, as well as the high frequency of this character pair in words of Greek origin (for which the Latin-alphabet `th` character pair derives from the Greek character θ, or ϑ), it seems undesirable to let the *at*-ligature pre-empt the *th* ligature for these words.

Fixing the *at*–*th* ligature pre-emption issue globally, e.g., via `\nolig{ath}{a|th}`, is not completely innocuous because doing so will also suppress the *at* ligature for words such as `boathook` and `rathole`, for which the *th* ligature would span a morpheme boundary and thus shouldn't be employed anyway. For such words, then, there's no need to suppress the *at* ligature. These cases are dealt with by providing `\keeplig` macros that deliberately let the *at* ligature take precedence over the trailing *th* ligature.

Suppressing an *et* ligature in favor of a subsequent *th* ligature via `\nolig{eth}{e|th}` is almost universally correct, either because the *th* ligature *should* take precedence—as in the words *ethics*, *methane*, and *teeth*—or because the *et* ligature would cross a morpheme boundary and hence shouldn't be used anyway, as in the words *forethought* and *rethink*.

I say that it's *almost* universally correct to do so because there are some words, such as `Beethoven`, `prophethood`, and `sweetheart`, for which the *th* ligature would be inappropriate anyway and hence the use of the *et* ligature would be unproblematic. To address this issue, `\keeplig` macros are

[26] A longer list of words for which the *at* ligature pre-empts the *th* ligature is given in the ancillary document selnolig-english-test.pdf.

provided for these words, deliberately letting the *et* ligature take precedence over the *th* ligature and resulting in them being typeset as *Beethoven*, *prophethood*, and *sweetheart*, respectively.[27]

7.6.4 Ligatures for *at* and *et* that pre-empt a *ta* ligature

There seem to be only very few words for which an *at* ligature might inappropriately pre-empt a more important *ta* ligature. One such word is `atap`, which may be more readable if it's typeset as *atap* rather than as *atap*.[28] Because of the apparent paucity of such cases, I have decided for now not to provide specific ligature suppression rules to handle them.

To the best of my (admittedly not exhaustive) knowledge, all words for which an *et* ligature might inappropriately pre-empt the use of a trailing *ta* ligature are words for which the *et* ligature crosses a morpheme boundary and hence probably shouldn't be used anyway.[29] As such, the *et*-related ligature suppression rules already in place, which are set up to deal with morpheme boundary crossing cases, should suffice to catch these cases as well.

[27] Note that this method works if the font being used provides *both et* and *th* ligatures. If the text font you employ provides only the *th* ligature but not the *et* ligature, these `\keeplig` macros should be disabled.

[28] It's not advisable, however, to specify a macro such as `\nolig{atap}{a|tap}` to address this case because of words such as *catapult* and *catacomb*, for which the use of the *at* ligature is presumably innocuous. Somebody please correct me if this assumption is not correct.

[29] Examples are *betake, betatter, bristletail, caretaker, cheetah, detach, detail, detain, dovetail, foretaste, horsetail, pretake, pretax, retable, retack, retard, retarget, timetable, whitetail,* and *wiretap*.

Appendices

A The package's main style file: selnolig.sty

```
% !TeX root = selnolig.tex
% !TEX TS-program = lualatex

\ProvidesPackage{selnolig}[2012/11/15]
\RequirePackage{luatexbase,luacode}

% This entire package is placed under the terms of the
% LaTeX Project Public License, version 1.3 or later
% (http://www.latex-project.org/lppl.txt).
% It has the status "maintained".
%
% Author: Mico Loretan (loretan dot mico at gmail dot com)

% Part 1: Preliminaries
% ---------------------

\def\pname{selnolig}
\def\pversion{0.151}
\def\pdate{2012/11/16}

% Announce who we are. Exit immediately if not running
% under lua(la)tex.
\typeout{----Package \pname, Version \pversion, Date \pdate----}

\RequirePackage{ifluatex}
\ifluatex\else
  \typeout{=======================================}
  \typeout{The package selnolig requires LuaLaTeX.  }
  \typeout{       Exiting immediately.              }
  \typeout{=======================================}
  \endinput
\fi

% A couple of ancillary macros to check if various ligature
% features (specifically: liga, clig, rlig, hlig, and dlig)
% are available and/or enabled for the text font in use.
```

```
% (These macros are courtesy of Clemens Niederberger; see
% also http://tex.stackexchange.com/a/82443/5001.)
\ExplSyntaxOn
\cs_new_eq:NN \IfFontFeatureExists \fontspec_if_feature:nTF

\cs_new:Npn \mico_fontfeature_if_active:nTF #1
  { \tl_if_in:NnTF \l_fontspec_rawfeatures_sclist { #1 } }

\cs_new_eq:NN \IfFontFeatureActive \mico_fontfeature_if_active:nTF
\ExplSyntaxOff


% If the 'fontspec' package isn't loaded by the time
% LaTeX executes the '\begin{document}' directive,
% exit with an error message.

\AtBeginDocument{%
  \@ifpackageloaded{fontspec}{}{%
    \typeout{=======================================}
    \typeout{ The selnolig package requires the       }
    \typeout{ 'fontspec' package, but it doesn't      }
    \typeout{ seem to be loaded. Exiting now...       }
    \typeout{=======================================}
    \endinput}
}


% Set up some fundamental Boolean variables, their
% default values, and define user-selectable options.

% The two main language options are 'english' and
% 'german'. We provide the 'otherlang' option just
% in case a user some day wants to provide ligature
% suppression patterns for languages other than
% English and German.

\newif\if@english\@englishfalse
\newif\if@german\@germanfalse
\newif\if@otherlang\@otherlangfalse

\DeclareOption{english}{\@englishtrue}
```

```
% synonymous options...
\DeclareOption{usenglish}{\@englishtrue}
\DeclareOption{ukenglish}{\@englishtrue}
\DeclareOption{USenglish}{\@englishtrue}
\DeclareOption{UKenglish}{\@englishtrue}
\DeclareOption{american}{\@englishtrue}
\DeclareOption{british}{\@englishtrue}
\DeclareOption{canadian}{\@englishtrue}
\DeclareOption{australian}{\@englishtrue}
\DeclareOption{newzealand}{\@englishtrue}

\DeclareOption{ngerman}{\@germantrue}
% synonymous options...
\DeclareOption{german}{\@germantrue}
\DeclareOption{austrian}{\@germantrue}
\DeclareOption{naustrian}{\@germantrue}
\DeclareOption{swiss}{\@germantrue}
\DeclareOption{swissgerman}{\@germantrue}

\DeclareOption{otherlang}{\@otherlangtrue}
\DeclareOption{otherlanguage}{\@otherlangtrue}


% For English, the default is to load only a fairly small
% or 'basic' set of non-ligation rules pertaining to
% f-ligatures. Among them are the "standard five" (ff,
% fi, fl, ffi, and ffl) as well as the ft ligature.
%
% Two options to override this "basic" setting:
% - broad-f  many more non-ligation rules for f-ligatures,
%            incl fb, fh, fj, and fk character pairs
% - hdlig    non-ligation rules for 'historic' and/or
%            'discretionary' ligatures, e.g., ct, sp, st,
%            sk, th, as, is, us, fr, ll, et, at, and ta

\newif\if@broadset\@broadsetfalse
\newif\if@hdligset\@hdligsetfalse

\DeclareOption{broad-f}{\@broadsettrue}
\DeclareOption{hdlig}{\@hdligsettrue}
```

```
% The package also provides hyphenation exception
% patterns for English and German language words.
% Loading these patterns is enabled by default. This
% can be disabled by providing the option
% 'noadditionalhyphenationpatterns'.

\newif\if@addhyph\@addhyphtrue
\DeclareOption{noadditionalhyphenationpatterns}{\@addhyphfalse}

% Check if 'historic' and/or 'discretionary' ligatures
% are enabled; if yes, set @hdligset to true.
% Perform this test only if fontspec is already loaded.
% Perform a two-step test in case only a "basic" font,
% such as Latin Modern Roman, is loaded.
\@ifpackageloaded{fontspec}{%
  \IfFontFeatureExists{hlig}{%
    \IfFontFeatureActive{hlig}{\@hdligsettrue}{}
    \IfFontFeatureActive{dlig}{\@hdligsettrue}{}
  }{}
}{}

% The 'basic' option automatically sets the
% preceding Booleans to 'false', even if historic
% and/or discretionary ligatures are enabled.

\DeclareOption{basic}{\@broadsetfalse\@hdligsetfalse}

% Last but not least, an option to set all Boolean
% variables (other than '@addhyph') to 'true'
% simultaneously.

\DeclareOption{all}{%
   \@englishtrue
   \@broadsettrue \@hdligsettrue
   \@germantrue
   \@otherlangtrue}

% Finally, process all options
\ProcessOptions\relax
```

```
% Part 2: Load the lua code and set up the user macros
% ----------------------------------------------------

\directlua{  require("selnolig.lua")  }

% The main user macro is called '\nolig':
\newcommand\nolig[2]{
   \directlua{
      suppress_liga( "\luatexluaescapestring{#1}",
                     "\luatexluaescapestring{#2}" )
   }
}

% A second user macro allows global overriding of
% rules set up by '\nolig':
\newcommand\keeplig[1]{
   \directlua{
      always_keep_liga( "\luatexluaescapestring{#1}" )
   }
}

% A third user macro: '\breaklig'. This is hopefully
% easier to remember than '\-\hspace{0pt}'
\newcommand\breaklig{\-{\hspace{0pt}}}

% Record operations of selnolig package to the log file:
% enabled via '\debugon' command

\newcommand\debugon{%
   \directlua{
      debug=true
   }
}


% Part 3: What to do if 'english' option is set
% ---------------------------------------------

\if@english
   % load English-language ligature suppression rules
   \usepackage{selnolig-english-patterns}
```

```
   % load additional hyphenation exception patterns
   \if@addhyph
      \usepackage{selnolig-english-hyphex}
   \fi
\fi


% Part 4: What to do if 'german' option is set
% --------------------------------------------

\if@german
   % load German-language ligature suppression rules
   \usepackage{selnolig-german-patterns}

   % load additional hyphenation exception patterns
   \if@addhyph
      \usepackage{selnolig-german-hyphex}
   \fi
\fi


% Part 5: What to do if 'otherlang' option is set
% -----------------------------------------------

\if@otherlang
    % currently nothing included
\fi
```

B The package's lua code: selnolig.lua

```
-- lua code for the selnolig package,
-- to be loaded with an instruction such as
--    \directlua{  require("selnolig.lua")  }
-- from a (Lua)LaTeX .sty file.
--
-- Author: Mico Loretan (loretan dot mico at gmail dot com)
--    (with crucial contributions by Taco Hoekwater,
--    Patrick Gundlach, and Steffen Hildebrandt)
-- Date: 2012/11/15
--
-- This entire package is placed under the terms of the
-- LaTeX Project Public License, version 1.3 or later
-- (http://www.latex-project.org/lppl.txt).
-- It has the status "maintained".


local glyph   = node.id('glyph')
local glue    = node.id("glue")
local whatsit = node.id("whatsit")
local userdefined

for n,v in pairs(node.whatsits()) do
  if v == 'user_defined' then userdefined = n end
end

local identifier = 123456  -- any unique identifier
local noliga={}
local keepliga={}          -- String -> Boolean
debug=false

function debug_info(s)
  if debug then
    texio.write_nl(s)
  end
end

local blocknode   = node.new(whatsit, userdefined)
blocknode.type    = 100
blocknode.user_id = identifier
```

```
local prefix_length = function(word,byte)
  return unicode.utf8.len(string.sub(word,0,byte))
end

function process_ligatures(nodes,tail)
  local s={}
  local current_node=nodes
  local build_liga_table =  function(strlen,t)
    local p={}
    for i = 1, strlen do
      p[i]=0
    end
    for k,v in pairs(t) do
      debug_info("Match: "..v[3])
      local c= string.find(noliga[v[3]],"|")
      local correction=1
      while c~=nil do
         debug_info("Position "..(v[1]+c))
         p[v[1]+c-correction] = 1
         c = string.find(noliga[v[3]],"|",c+1)
         correction=correction+1
      end
    end
    debug_info("Liga table: "..table.concat(p, ""))
    return p
  end
  local apply_ligatures=function(head,ligatures)
     local i=1
     local hh=head
     local last=node.tail(head)
     for curr in node.traverse_id(glyph,head) do
       if ligatures[i]==1 then
         debug_info("Inserting noliga whatsit before glyph: "..unicode.utf8.char(curr.char))
         node.insert_before(hh,curr, node.copy(blocknode))
         hh=curr
       end
       last=curr
       if i==#ligatures then
         --debug_info("Leave node list on position: "..i)
         break
```

```
      end
      i=i+1
    end
    if(last~=nil) then
      -- debug_info("Last char: "..unicode.utf8.char(last.char))
    end
end
for t in node.traverse(nodes) do
  if t.id==glyph then
    --s[#s+1]=string.lower(unicode.utf8.char(t.char))
    s[#s+1]=unicode.utf8.char(t.char)
  elseif t.id== glue then
    local f=string.gsub(table.concat(s,""),"[\\?!,\\.]+","")
    local throwliga={}
    for k,v in pairs(noliga) do
      local count=1
      local match = string.find(f,k)
      while match do
        count=match
        keep=false
        debug_k1=""
        for k1,v1 in pairs(keepliga) do
          if v1 and string.find(f,k1) and string.find(k1,k) then
            debug_k1=k1
            keep=true
            break
          end
        end
        if not keep then
          debug_info("pattern match: "..f .." - "..k)
          local n = match + string.len(k) - 1
          table.insert(throwliga,{prefix_length(f,match),n,k})
        else
          debug_info("pattern match nolig and keeplig: "..f .." - "..k.." - "..debug_k1)
        end
        match= string.find(f,k,count+1)
      end
    end
    if #throwliga==0 then
    --  debug_info("No ligature suppression for: "..f)
    else
```

```
        debug_info("Do ligature suppression for: "..f)
        local ligabreaks=build_liga_table(f:len(),throwliga)
        apply_ligatures(current_node,ligabreaks)
      end
      s={}
      current_node=t
    end
  end
end -- end of function process_ligatures(nodes,tail)

function suppress_liga(s,t)
  noliga[s]=t
end

function always_keep_liga(s)
  keepliga[s]=true
end

function drop_special_nodes (nodes,tail)
  for t in node.traverse(nodes) do
    if t.id == whatsit and t.subtype == userdefined and t.user_id == identifier
    then
      node.remove(nodes,t)
      node.free(t)
    end
  end
end

luatexbase.add_to_callback( "ligaturing",
   process_ligatures, "Filter ligatures", 1 )
```

C English-language ligature suppression patterns: selnolig-english-patterns.sty

```
% !TeX root = selnolig.tex
% !TEX TS-program = lualatex

\ProvidesPackage{selnolig-english-patterns}%
[2012/11/15]

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% terms of the LaTeX Project Public License,
% version 1.3 or later
% (http://www.latex-project.org/lppl.txt).
% It has the status "maintained".
%
% Author: Mico Loretan
%   (loretan dot mico at gmail dot com)



% Part 1: "Basic" f-ligature patterns
% ==================================

% (a) ff -> f-f

\nolig{lfful}{lf|ful}
 % shelfful bookshelffuls -- TeXBook, p. 19


% (b) fi -> f-i
 % no cases in 'basic' group


% (c) fl -> f-l

\nolig{fless}{f|less}
 % beefless leafless ...
 % Also: cuffless stuffless

\nolig{flike}{f|like}
 % dwarflike elflike ...
 % Also: rufflike clifflike

\nolig{flife}{f|life}
 % halflife shelflife

\nolig{flive}{f|live}
 % halflives shelflives

\nolig{fline}{f|line}
 % halfline roofline offline

\nolig{leaflet}{leaf|let}
\nolig{Leaflet}{Leaf|let}
 % leaflet(-s, -ed) leafleting
 % leafletting leafletted
 % leafleteer(s)

\nolig{pdflatex}{pdf|latex}
\nolig{Pdflatex}{Pdf|latex}
 % better to write 'pdf\LaTeX', right?


% (d) ffi -> ff-i

\nolig{faffian}{faff|ian}
 % Pfaffian
 % (must avoid picking up 'affianced')

\nolig{lffian}{lff|ian}
 % Wolffian Wulffian
```

```
% (e) ffl -> ff-l

\nolig{fflaw}{ff|law}
 % scofflaw scofflaws

\nolig{fflink}{ff|link}
 % cufflink cufflinks

\nolig{ffload}{ff|load}
 % offload offloads offloaded


% (f) ffi -> f-fi

\nolig{haffinch}{haf|finch}
 % chaffinch(es)

\nolig{lffish}{lf|fish}
 % wolffish


% (g) ffl -> f-fl
 % no cases in 'basic' group


% (h) ft -> f-t

\nolig{ieftain}{ief|tain}
\nolig{alftime}{alf|time}
\nolig{alftone}{alf|tone}
\nolig{ooftop}{oof|top}
\nolig{ooftree}{oof|tree}
 % chieftain halftime halftone
 % rooftop rooftree

\nolig{ifth}{if|th}
\nolig{lfth}{lf|th}
 % fifth(s) twelfth(s)
 % (Obscuring the 'th' pair with an
 % 'ft' ligature just looks weird!)

\nolig{lftr}{lf|tr}
 % wolftrap calftrap

\nolig{eaftr}{eaf|tr}
 % leaftrap (gutters, pools ...)

\nolig{fftr}{ff|tr}
 % offtrack



% Part 2: Additional f-ligature suppression
% patterns if 'broad' option is set.
% =========================================

\if@broadset

% (a) ff -> f-f
 % no cases in 'broad' group


% (b) fi -> f-i

\nolig{elfin}{elf|in}
\nolig{Elfin}{Elf|in}

\nolig{afing}{af|ing}
 % chafing leafing loafing sheafing
 % strafing vouchsafing

\nolig{eefing}{eef|ing}
 % beefing reefing
```

```
\nolig{iefing}{ief|ing}
 % briefing debriefing

\nolig{ifing}{if|ing}
 % coifing fifing jackknifing knifing
 % midwifing waifing wifing

\nolig{oofing}{oof|ing}
 % goofing hoofing roofing ...

\nolig{lfing}{lf|ing}
 % golfing rolfing ...

\nolig{arfing}{arf|ing}
 % barfing bedwarfing dwarfing...

\nolig{serfing}{serf|ing}
\nolig{Serfing}{Serf|ing}
\nolig{kerfing}{kerf|ing}
\nolig{Kerfing}{Kerf|ing}
% Don't specify 'erfing' search string
%   b/c of 'butterfinger'

\nolig{urfing}{urf|ing}
 % (wind-) surfing turfing

\nolig{rfism}{rf|ism}
 % dwarfism
\nolig{rfist}{rf|ist}
 % dwarfist

\nolig{deafish}{deaf|ish}
\nolig{dwarfish}{dwarf|ish}
\nolig{elfish}{elf|ish}
 % elfish selfish unselfish, etc.
\nolig{oafish}{oaf|ish}
\nolig{serfish}{serf|ish}
\nolig{wolfish}{wolf|ish}

\nolig{Deafish}{Deaf|ish}
\nolig{Dwarfish}{Dwarf|ish}
\nolig{Elfish}{Elf|ish}
\nolig{Oafish}{Oaf|ish}
\nolig{Serfish}{Serf|ish}
\nolig{Wolfish}{Wolf|ish}

\nolig{beefier}{beef|ier}
\nolig{comfier}{comf|ier}
\nolig{goofier}{goof|ier}
\nolig{gulfier}{gulf|ier}
\nolig{leafier}{leaf|ier}
\nolig{reefier}{reef|ier}
\nolig{surfier}{surf|ier}
\nolig{turfier}{turf|ier}

\nolig{Beefier}{Beef|ier}
\nolig{Comfier}{Comf|ier}
\nolig{Goofier}{Goof|ier}
\nolig{Gulfier}{Gulf|ier}
\nolig{Leafier}{Leaf|ier}
\nolig{Reefier}{Reef|ier}
\nolig{Surfier}{Surf|ier}
\nolig{Turfier}{Turf|ier}
 % (Mustn't perform 'fier -> f-ier'
 % substitution because of words
 % such as pacifier, reifier, etc.)

\nolig{afiest}{af|iest}
\nolig{efiest}{ef|iest}
\nolig{lfiest}{lf|iest}
\nolig{mfiest}{mf|iest}
\nolig{ofiest}{of|iest}
\nolig{rfiest}{rf|iest}
 % leafiest beefiest reefiest ...
 % (Mustn't do 'fiest -> f-iest'
 %   subst. b/c of 'fiesta')
```

```
\keeplig{amselfish}
\keeplig{stelfink}

\nolig{fily}{f|ily}
 % beefily goofily
 % This rule also catches the
 %    ffily -> ff-ily case:
 % daffily fluffily gruffily ...

\nolig{oofiness}{oof|iness}
 % goofiness
 % (Mustn't do 'finess -> f-iness'
 % substitution b/c of 'finesse')


% (c) fl -> f-l

\nolig{aloofly}{aloof|ly}
\nolig{briefly}{brief|ly}
\nolig{chiefly}{chief|ly}
\nolig{deafly}{deaf|ly}
\nolig{liefly}{lief|ly}

\nolig{Aloofly}{Aloof|ly}
\nolig{Briefly}{Brief|ly}
\nolig{Chiefly}{Chief|ly}
\nolig{Deafly}{Deaf|ly}
\nolig{Liefly}{Lief|ly}
 % (Mustn't perform 'fly -> f-ly' subst.
 % b/c of 'fly' 'butterfly' ...)


% (d) ffi -> ff-i

\nolig{affish}{aff|ish}
\nolig{offish}{off|ish}
\nolig{iffish}{iff|ish}
\nolig{uffish}{uff|ish}
 % draffish offish sniffish gruffish

\nolig{ffing}{ff|ing}
 % baffing biffing bluffing...

\nolig{ffier}{ff|ier}
 % buffier chaffier ...

%\nolig{ffily}{ff|ily}
 % Caught by 'fily -> f-ily' rule

\nolig{ffiness}{ff|iness}
 % fluffiness huffiness ...

\nolig{waffie}{waff|ie}
\nolig{Waffie}{Waff|ie}

\nolig{ffies}{ff|ies}
 % baffies biffies jiffies ...
 % buffiest chaffiest ...


% (e) ffl -> ff-l

\nolig{ffly}{ff|ly}
 % bluffly gruffly ruffly ...


% (f) ffi -> f-fi
 % nothing additional in 'broad' group


% (g) ffl -> f-fl

\nolig{afflower}{af|flower}
 % safflower safflowers
```

```
% (h) ft -> f-t

\nolig{ifteen}{if|teen}
 % fifteen fifteens fifteenth

\nolig{fifti}{fif|ti}
\nolig{Fifti}{Fif|ti}
 % fifties fiftieth fiftieths

\nolig{fifty}{fif|ty}
\nolig{Fifty}{Fif|ty}
 % fifty fiftyish



% (i) fb, fh, fj, and fk ligatures

% suppress these ligatures globally, but
% make exception for Kafka, fjord, and fjell
\nolig{fb}{f|b}
\nolig{fh}{f|h}
\nolig{fj}{f|j}
\nolig{fk}{f|k}

\keeplig{Kafka}
\keeplig{fjord}
\keeplig{fjell}




\fi % end of \if@broadset block




% Part 3: Discretionary ligatures crossing
% morpheme boundaries

% ct, st, sp,
% th, at, et, as, is, us, ta, ll, sk
% ---------------------------------------

\if@hdligset


% (A) st -> s-t
% -------------

\nolig{osstalk}{oss|talk}
 % crosstalk
\nolig{gstai}{gs|tai}
 % dogstail
\nolig{nstak}{ns|tak}
 % painstaker painstaking
\nolig{stight}{s|tight}
 % gastight
\nolig{stooth}{s|tooth}
 % houndstooth
\nolig{steeth}{s|teeth}
 % houndsteeth

%%% dis-t... words
\nolig{dista}{dis|ta}
\nolig{Dista}{Dis|ta}
 % distant distasteful
\nolig{distem}{dis|tem}
\nolig{Distem}{Dis|tem}
 % distemperate
\nolig{disten}{dis|ten}
\nolig{Disten}{Dis|ten}
 % distended
\nolig{istil}{is|til}
 % distil distillation
\nolig{distin}{dis|tin}
\nolig{Distin}{Dis|tin}
 % distinct distinguish
```

```
\nolig{disto}{dis|to}
\nolig{Disto}{Dis|to}
 % distort distortion
\nolig{distr}{dis|tr}
\nolig{Distr}{Dis|tr}
 % distract distribution distrust
\nolig{distu}{dis|tu}
\nolig{Distu}{Dis|tu}
 % disturb

%%% mis-t... words
\nolig{mista}{mis|ta}
\nolig{Mista}{Mis|ta}
 % mistake mistaken mistaught unmistakable
\nolig{mistea}{mis|tea}
\nolig{Mistea}{Mis|tea}
 % misteach
\nolig{istend}{is|tend}
 % mistend distend
\nolig{isterm}{is|term}
 % misterm misterms
\nolig{isth}{is|th}
 % misthink misthought misthrew misthrow
 % isthmus calisthenic
\nolig{istime}{is|time}
 % mistime mistimed
\nolig{istitl}{is|titl}
 % mistitle
\nolig{istook}{is|took}
 % mistook
\nolig{istouc}{is|touc}
 % mistouch
\nolig{mistrac}{mis|trac}
\nolig{Mistrac}{Mis|trac}
 % Mistrace
\nolig{mistran}{mis|tran}
\nolig{Mistran}{Mis|tran}
 % Mistranscribe Mistranslate
\nolig{istrea}{is|trea}
 % mistreat mistreatment
\nolig{mistru}{mis|tru}
\nolig{Mistru}{Mis|tru}
 % mistrust mistruth
\nolig{istrys}{is|trys}
 % mistryst
\nolig{mistu}{mis|tu}
\nolig{Mistu}{Mis|tu}
 % mistune Mistutor
\nolig{istyp}{is|typ}
 % mistype

\nolig{aastricht}{aas|tricht}
 % Maastricht


% (B) ct -> c-t
% -------------

\nolig{rctan}{rc|tan}
 % arctangent
\nolig{rctat}{rc|tat}
 % coarctation
\nolig{rctic}{rc|tic}
 % arctic antarctic Antarctica subarctic


% (C) sp -> s-p
% -------------

\nolig{othesp}{othes|p}
 % clothespin clothespress
\nolig{speople}{s|people}
 % business- congress- crafts-
 % dis- news- sales- spokes-
 % towns- trades- tribes- people
\nolig{sperson}{s|person}
```

```
 % business- congress- crafts- drafts-
 % news- sales- spokes- person
\nolig{espas}{es|pas}
 % trespass trespassing
\nolig{isplat}{is|plat}
 % cisplatin

\nolig{disp}{dis|p}
\nolig{Disp}{Dis|p}
 % disparage disparaging ...

\nolig{misp}{mis|p}
\nolig{Misp}{Mis|p}
 % misplace misperception misprint

\nolig{susp}{sus|p}
\nolig{Susp}{Sus|p}
 % suspend suspension suspicious
\nolig{sph}{s|ph} % 'ph' from Greek 'phi'!
 % atmosphere biosphere hemisphere
 % spherical asphodel phosphorous phosphate
 % blaspheme blasphemy

\nolig{transpa}{trans|pa}
 % transparent transpacific
\nolig{transpe}{trans|pe}
 % transpersonal
\nolig{transpie}{trans|pie}
 % transpierce
\nolig{transpl}{trans|pl}
 % transplant
\nolig{transpol}{trans|pol}
 % transpolar
\nolig{transpor}{trans|por}
 % transport transportation
\nolig{transpos}{trans|pos}
 % transpose transposon
```

```
\nolig{risprud}{ris|prud}
 % jurisprudence
\nolig{spiec}{s|piec}
 % crosspiece frontispiece

\nolig{ewspa}{ews|pa}
 % newspaper
\nolig{ewspr}{ews|pr}
 % newsprint


% (D) th -> t-h
% -------------

\nolig{eethov}{eet|hov}
 % Beethoven
\nolig{thook}{t|hook}
 % boathook meathook pothook
\nolig{thouse}{t|house}
 % boathouse cathouse courthouse ...
\nolig{othol}{ot|hol}
 % foothold knothole potholder ...
\nolig{lthol}{lt|hol}
 % bolthole
\nolig{sthol}{st|hol}
 % posthole pesthole
\nolig{athol}{at|hol}
 % rathole
\nolig{arthog}{art|hog}
 % warthog
\nolig{stha}{st|ha}
 % firsthand postharvest posthaste
\nolig{thawk}{t|hawk}
 % nighthawk
\nolig{horth}{hort|h}
 % shorthair shorthand shorthorn
\nolig{arthei}{art|hei}
 % apartheid antiapartheid
```

```
\nolig{thead}{t|head}
 % bolthead cathead fathead ...
\nolig{therd}{t|herd}
 % goatherd neatherd
\nolig{theap}{t|heap}
 % dustheap
\nolig{theart}{t|heart}
 % fainthearted sweetheart ...
\nolig{uthear}{ut|hear}
 % outhear outheard
\nolig{thill}{t|hill}
 % anthill foothill
\nolig{thood}{t|hood}
 % adulthood knighthood ...
\nolig{thunt}{t|hunt}
 % pothunt outhunt
\nolig{rthol}{rt|hol}
 % porthole
\nolig{sthum}{st|hum}
 % posthumous
\nolig{uthau}{ut|hau}
 % outhaul
\nolig{uthit}{ut|hit}
 % outhit
\nolig{uthom}{ut|hom}
 % outhomer
\nolig{uthow}{ut|how}
 % outhowl
\nolig{uthum}{ut|hum}
 % outhumor
\nolig{uthust}{ut|hust}
 % outhustle
\nolig{tthour}{tt|hour}
 % watthour kilowatthour
\nolig{sthm}{s|thm}
 % asthma isthmus
```

```
% (E) at -> a-t
% -------------

\nolig{lbatr}{lba|tr}
 % albatross
\nolig{atroop}{a|troop}
 % paratrooper
\nolig{eatra}{ea|tra}
 % seatrain seatransport


% (F) et -> e-t
% -------------

\nolig{ninet}{nine|t}
\nolig{Ninet}{Nine|t}
 % ninetieth ninetieths ninety nineteen nineties

\nolig{ametag}{ame|tag}
 % nametag
\nolig{beta}{be|ta}
\nolig{Beta}{Be|ta}
 % betake betatter beta
\nolig{betr}{be|tr}
\nolig{Betr}{Be|tr}
 % betray betroth

\nolig{deta}{de|ta}
 % detach detain detail
\nolig{etect}{e|tect}
 % detect undetectable detective
\nolig{detent}{de|tent}
\nolig{Detent}{De|tent}
 % detent detention
\nolig{detest}{de|test}
\nolig{Detest}{De|test}
 % detest
\nolig{detr}{de|tr}
```

```
\nolig{Detr}{De|tr}
 % detract detrain detriment detritus

\nolig{etail}{e|tail}
 % bristletail detail dovetail horsetail
\nolig{etah}{e|tah}
 % cheetah chetah
\nolig{etak}{e|tak}
 % betake retake caretaker
\nolig{eteach}{e|teach}
 % reteach
\nolig{etell}{e|tell}
 % foretell fortunetelling
\nolig{eterg}{e|terg}
 % detergent
\nolig{eterio}{e|terio}
 % deteriorate
\nolig{eterm}{e|term}
 % determent determinant preterm
\nolig{etext}{e|text}
 % pretext retext teletext
\nolig{etick}{e|tick}
 % bluetick detick
\nolig{etide}{e|tide}
 % betide yuletide
\nolig{etigh}{e|tigh}
 % retighten
\nolig{etime}{e|time}
 % betime lifetime peacetime sometime
\nolig{etrain}{e|train}
 % detrain drivetrain housetrain retrain
\nolig{etrap}{e|trap}
 % firetrap livetrap mousetrap
\nolig{etree}{e|tree}
 % axletree saddletree shoetree

\nolig{imetable}{ime|table}
 % timetable

\nolig{reteen}{re|teen}
 % preteen
\nolig{retend}{re|tend}
 % pretend
\nolig{retenc}{re|tenc}
 % pretence
\nolig{retens}{re|tens}
 % pretense pretension
\nolig{retent}{re|tent}
\nolig{Retent}{Re|tent}
 % pretentious retention retentive
\nolig{retest}{re|test}
\nolig{Retest}{Re|test}
 % pretest retest

\nolig{reta}{re|ta}
\nolig{Reta}{Re|ta}
 % retag retape retake
 % foretaste caretaker
 % pretaste pretape pretaxretain
 % retain retake retaliate retard
 % retarget retaste wiretap
 \keeplig{pretable} % interpretable
 \keeplig{cretar}   % secretary
\nolig{retie}{re|tie}
\nolig{Retie}{Re|tie}
 % retie entireties sureties
\nolig{retil}{re|til}
\nolig{Retil}{Re|til}
 % retile
\nolig{retim}{re|tim}
\nolig{Retim}{Re|tim}
 % retime beforetime
\nolig{retint}{re|tint}
\nolig{Retint}{Re|tint}
 % retint
\nolig{retir}{re|tir}
```

```
\nolig{Retir}{Re|tir}
 % retire retiring
\nolig{retitl}{re|titl}
\nolig{Retitl}{Re|titl}
 % retitle pretitling
\nolig{retra}{re|tra}
\nolig{Retra}{Re|tra}
 % retrace retrack retract retrans retransmit
\nolig{retre}{re|tre}
\nolig{Retre}{Re|tre}
 % pretreat retread retreat retrench
\nolig{retri}{re|tri}
\nolig{Retri}{Re|tri}
 % pretrim pretrial retrieve retribution
 % retries retrim
\nolig{retu}{re|tu}
\nolig{Retu}{Re|tu}
 % return retune unreturnable

\nolig{uetooth}{ue|tooth}
 % bluetooth

\nolig{deter}{de|ter}
\nolig{Deter}{De|ter}
 % deter determine deteriorate undeterred
\nolig{ceties}{ce|ties}
 % niceties
\nolig{feties}{fe|ties}
 % safeties unsafeties biosafeties

\nolig{fety}{fe|ty}
 % safety
\nolig{lety}{le|ty}
 % subtlety teletype teletypewriter
\nolig{rety}{re|ty}
 % surety entirety retype pretype
\nolig{etyp}{e|typ}
 % archetype archetypal retype pretype
```

```
% (G) as -> a-s
% -------------

\nolig{eastran}{ea|stran}
 % seastrand
\nolig{aspore}{a|spore}
 % diaspora megaspore tetraspore
\nolig{aseps}{a|seps}
 % asepsis
\nolig{asept}{a|sept}
 % aseptic aseptically
\nolig{asund}{a|sund}
\nolig{Asund}{A|sund}
 % asunder
\nolig{infras}{infra|s}
\nolig{Infras}{Infra|s}
 % infrastructure infraspecific
\nolig{megast}{mega|st}
\nolig{Megast}{Mega|st}
 % megastructure megastar
\nolig{megasp}{mega|sp}
\nolig{Megasp}{Mega|sp}
 % megaspores megascopic
\nolig{aspoon}{a|spoon}
 % teaspoon

% how to do 'asea'?

% (H) is -> i-s
% -------------

% (a) not across morpheme boundaries
% (The following may be a bug in fontspec)

\nolig{fish}{fi|sh}
```

```
\nolig{fist}{fi|st}
\nolig{Fist}{Fi|st}



% (b) across morpheme boundaries

%% Mustn't do global \nolig{antis}{anti|s}
%% because of words such as sycophantism,
%% vigilantism, and mantissa.

\nolig{antisa}{anti|sa}
\nolig{Antisa}{Anti|sa}
 % antisag antisatellite
\nolig{antisc}{anti|sc}
\nolig{Antisc}{Anti|sc}
 % antiscience
\nolig{antise}{anti|se}
\nolig{Antise}{Anti|se}
 % antisecrecy antisense antiseptic
\nolig{antisha}{anti|sha}
\nolig{Antisha}{Anti|sha}
 % antishark antiship antishock
\nolig{antishi}{anti|shi}
\nolig{Antishi}{Anti|shi}
 % antishark antiship antishock
\nolig{antisho}{anti|sh}
\nolig{Antisho}{Anti|sh}
 % antishark antiship antishock
\nolig{antisk}{anti|sk}
\nolig{Antisk}{Anti|sk}
 % antiskid
\nolig{antisl}{anti|sl}
\nolig{Antisl}{Anti|sl}
 % antislavery antislip
\nolig{antismo}{anti|smo}
\nolig{Antismo}{Anti|smo}
 % antismog antismoke
\nolig{antismu}{anti|smu}
\nolig{Antismu}{Anti|smu}
 % antismuggling antismut
\nolig{antisn}{anti|sn}
\nolig{Antisn}{Anti|sn}
 % antisnob
\nolig{antiso}{anti|so}
\nolig{Antiso}{Anti|so}
 % antisocial antisolar
\nolig{antisp}{anti|sp}
\nolig{Antisp}{Anti|sp}
 % antispasmodic antispeculative
\nolig{antist}{anti|st}
\nolig{Antist}{Anti|st}
 % antistatic antistick antistress antistrike
\nolig{antisu}{anti|su}
\nolig{Antisu}{Anti|su}
 % antisubmarine antisubversion
\nolig{antisy}{anti|sy}
\nolig{Antisy}{Anti|sy}
 % antisymmetric antisyphilitics

\nolig{multis}{multi|s}
\nolig{Multis}{Multi|s}
 % multiscreen multisense multisensory
 % multiservice multisided multisite
 % multisize multiskilled multisource
 % multispecies multispectral multispeed
 % multisport multistage multistate
 % multistemmed multistep multistoried
 % multistory multistranded multisyllabic
 % multisystem
\nolig{isph}{i|sph}
 % hemisphere planisphere hemispheric



% (I) us -> u-s
% -------------
```

```
% %% (no examples yet)



% (J) sk -> s-k
% (available in EB Garamond font)
% ------------------------------

\nolig{skeep}{s|keep}
 % greenskeeper groundskeeper miskeep
\nolig{iskai}{is|kai}
 % triskaidekaphobia
\nolig{thsk}{ths|k}
 % rathskeller
\nolig{misk}{mis|k}
\nolig{Misk}{Mis|k}
 % miskeep miskept miskick misknow



% (K) ll -> l-l
% -------------

\nolig{llike}{l|like}
 % animallike soullike
\nolig{lless}{l|less}
 % soulless tailless



% (L) fr -> f-r
% -------------

\nolig{oofr}{oof|r}
 % proofread proofroom proofrock
```

```
% Part 4: Disabling one discretionary
% ligature so that a subsequent, more
% important one doesn't get pre-empted
% ------------------------------------


% (i) as, is, and us preceding st
% ..............................

\nolig{ast}{a|st}
\nolig{ust}{u|st}

\nolig{ist}{i|st}



% (ii) as, is, and us preceding sp
% ..............................

\nolig{lasp}{la|sp}
 % clasp unclasp beclasp enclasp
\nolig{aspar}{a|spar}
\nolig{Aspar}{A|spar}
 % asparagus Caspar aspartame asparkle
\nolig{asper}{a|sper}
\nolig{Asper}{A|sper}
 % aspersion Casper Jasper exasperate
\nolig{aspir}{a|spir}
\nolig{Aspir}{A|spir}
 % aspire aspirator aspirin
\nolig{gasp}{ga|sp}
\nolig{Gasp}{Ga|sp}
 % gasp
\nolig{hasp}{ha|sp}
\nolig{Hasp}{Ha|sp}
 % hasp
\nolig{rasp}{ra|sp}
\nolig{Rasp}{Ra|sp}
 % grasp rasp raspberry
```

```
\nolig{wasp}{wa|sp}
\nolig{Wasp}{Wa|sp}
 % wasp waspish

\nolig{risp}{ri|sp}
 % crisp
\nolig{ispani}{i|spani}
 % hispanic
\nolig{lisp}{li|sp}
\nolig{Lisp}{Li|sp}
 % lisp lisping
\nolig{whisp}{whi|sp}
\nolig{Whisp}{Whi|sp}
 % whisper
\nolig{wisp}{wi|sp}
\nolig{Wisp}{Wi|sp}
 % wisp

\nolig{cusp}{cu|sp}
\nolig{Cusp}{Cu|sp}
 % cusp bicuspid tricuspid
\nolig{ausp}{au|sp}
\nolig{Ausp}{Au|sp}
 % auspicious inauspicious


% (iii) at and et preceding th
% ............................

%% If you have 'at' and 'et' ligatures as
%% well as the 'th' ligature -- and want
%% the 'th' ligature to take precedence,
%% make sure the following macros are
%% active (i.e., not commented out).

\nolig{ath}{a|th}
\nolig{eth}{e|th}
% The preceding instructions are a bit too
% broad as they also suppress the at ligature
% for words such as boathook, flathead,
% greathearted, goatherd, and neatherd,
% and the 'et' ligature in words such as
% Beethoven, prophethood, and sweetheart.
% To address these cases, we provide \keeplig
% macros to deliberately let the 'at' and 'et'
% ligatures pre-empt the 'th' ligatures:

\keeplig{oathook} % boathook
\keeplig{eathook} % meathook
\keeplig{athouse} % bathouse boathouse cathouse
\keeplig{athole} % rathole
\keeplig{athead} % cathead fathead flathead meathead
\keeplig{atherd} % goatherd neatherd
\keeplig{eatheart} % greathearted

\keeplig{Beethoven}
\keeplig{ophethood}
\keeplig{eetheart}

% Specifying a group of narrower \nolig
% commands to avoid catching
% these words turns out to be quite
% involved. The following list is but a
% start. If anyone feels inclined to edit
% and augment this list, please be my guest.
% For now, the macros are commented out.

%\nolig{trath}{tra|th}
% % ultrathin intrathoracic strath
%\nolig{athera}{a|thera}
% % aromatherapy
%\nolig{athero}{a|thero}
% % atherosclerosis
%\nolig{athl}{a|thl}
% % athlete triathlon heathland
```

```
%\nolig{athei}{a|thei}
% % atheism atheist
%\nolig{death}{dea|th}
% % death deathbed ...
%\nolig{heath}{hea|th}
% % heath heather heathen sheath
%\nolig{feath}{fea|th}
% % feather featherbed
%\nolig{weath}{wea|th}
% % weather
%\nolig{gath}{ga|th}
% % gather
%\nolig{bath}{ba|th}
% % bath bathyscaph
%\nolig{path}{pa|th}
% % path empathy telepathy
%\nolig{cathed}{ca|thed}
% % cathedral unscathed
%\nolig{cathet}{ca|thet}
% % catheter
%\nolig{cathod}{ca|thod}
% % cathode
%\nolig{wath}{wa|th}
% % swath swathe


% (iv) at and et preceding ta
% ..........................

% These cases all seem to involve 'at'
% or 'et' crossing a ligature boundary.
% As such, these cases should be dealt
% with in Part 3 of this file.


\fi  %% end of \@ifdiscr
```

D German-language ligature suppression patterns: selnolig-german-patterns.sty

Introductory notes:

- Macros that don't work quite right yet are commented out with %%%%% markers. (The reason these macros don't work quite right is that the search strings contain an Umlaut character in the part *before* the ligation-suppression point. Hopefully, this issue will be fixed soon.)

- To accommodate the practice of Swiss-German writers of not using the "ß" character (and using "ss" in its place), all search-and-insert strings that contain an "ß" character are duplicated with equivelent search-and-insert strings that contain "ss" instead.

```
% !TeX root = selnolig.tex
% !TEX TS-program = lualatex

\ProvidesPackage{selnolig-german-patterns}%
[2012/11/15]

% This entire package is placed under the
% terms of the LaTeX Project Public License,
% version 1.3 or later
% (http://www.latex-project.org/lppl.txt).
% It has the status "maintained".
%
% Author: Mico Loretan
%   (loretan dot mico at gmail dot com)


% 1. ff -> f-f
% ------------
\nolig{affall}{af|fall}
 % Straffall
\nolig{haffell}{haf|fell}
 % Schaffell (Vorsicht: Staffellauf...)
\nolig{affris}{af|fris}
 % Schlaffrisur
\nolig{riffall}{rif|fall}
 % Tariffalle
\nolig{effahr}{ef|fahr}
 % Cheffahrer
\nolig{ffunk}{f|funk}
 % Brieffunktion Abruffunktion
\nolig{ffach}{f|fach}
 % elffach zwölffach fünffach Brieffach
\nolig{pffront}{pf|front}
 % Kampffront
\nolig{heffront}{hef|front}
 % Cheffront
\nolig{iffront}{if|front}
 % Tariffront
\nolig{mpffüh}{mpf|füh}
 % Kampfführung
\nolig{opffris}{opf|fris}
 % Topffrisur Zopffrisur
\nolig{uffahr}{uf|fahr}
 % auffahren, Auffahrunfall
\nolig{uffall}{uf|fall}
 % auffallen Anruffallen
\nolig{uffalt}{uf|falt}
 % auffalten selbstauffaltend
\nolig{ffand}{f|fand}
 % auffand auffanden
\nolig{uffang}{uf|fang}
 % auffangen Auffanglager
```

```
\nolig{ffass}{f|fass}
 % auffassbar, Lebensauffassung
\nolig{ffaß}{f|faß}
 % auffaßte
\nolig{uffeue}{uf|feue}
 % Lauffeuer
\nolig{rffeue}{rf|feue}
 % Dorffeuerwehr Torffeuer
\nolig{ffolg}{f|folg}
 % darauffolgen Impffolgen
\nolig{ufford}{uf|ford}
 % auffordern
\nolig{rafford}{raf|ford}
 % Strafforderung
\nolig{rifford}{rif|ford}
 % Tarifforderung
\nolig{fform}{f|form}
 % Laufform Kopfform Gugelhupfform
\nolig{fforst}{f|forst}
 % aufforsten
\nolig{fforsch}{f|forsch}
 % Schlafforschung Impfforschung
\nolig{ffrau}{f|frau}
 % Kauffrau, Kauffrauen
\nolig{uffrass}{uf|frass}
 % auffrassen
\nolig{uffraß}{uf|fraß}
 % auffraßen
\nolig{uffress}{uf|fress}
 % auffressen
\nolig{uffreß}{uf|freß}
 % auffreßt
\nolig{ffrisch}{f|frisch}
 % Auffrischung
\nolig{uffrisi}{uf|frisi}
 % auffrisieren
\nolig{uffriss}{uf|friss}
 % auffrisste
\nolig{ffrist}{f|frist}
 % Prüffrist Ablauffrist
\nolig{uffriß}{uf|friß}
 % auffrißt
\nolig{uffräss}{uf|fräss}
 % auffrässe
\nolig{uffräß}{uf|fräß}
 % auffräße
\nolig{ffuhr}{f|fuhr}
 % auffuhren
\nolig{ffäch}{f|fäch}
 % auffächern Brieffächer
\nolig{ffäh}{f|fäh}
 % auffährt lauffähig hoffähig
 % kampffähig
\nolig{ffäll}{f|fäll}
 % unauffällig straffällig
\nolig{ffäng}{f|fäng}
 % auffängt
\nolig{fführ}{f|führ}
 % aufführen, Uraufführung
\nolig{ffüll}{f|füll}
 % auffüllen
%%%%%\nolig{üffeld}{üf|feld}
 % Prüffeld % but: Schnüffeldienst
\nolig{lffeld}{lf|feld}
 % Schilffeld
\nolig{mpffeld}{mpf|feld}
 % Kampffeld
\nolig{ffreund}{f|freund}
 % Brieffreund


% 2. fi -> f-i
% ------------

\nolig{hefideo}{hef|ideo}
 % Chefideologe
```

```
\nolig{pfinst}{pf|inst}
 % Zupfinstrumente Wahlkampfinstitution
\nolig{findex}{f|index}
 % Kaufindex Pfandbriefindex
\nolig{ufindi}{uf|indi}
 % Kaufindices Laufindizes
\nolig{ufinter}{uf|inter}
 % Kaufinteresse
\nolig{fingenieur}{f|ingenieur}
 % Prüfingenieur Kaufingenieur
\nolig{finsel}{f|insel}
 % Schilfinsel Schafinsel
\nolig{fintrig}{f|intrig}
 % Briefintrige Hofintrige


% 3. fl -> f-l
% ------------

\nolig{afleder}{af|leder}
 % Schafleder
\nolig{aflos}{af|los}
 % straflos, schlaflos
\nolig{aflan}{af|lan}
 % Staflandesgericht Graafland
\nolig{flein}{f|lein}
 % Laufleine Scherflein Wölflein
 % Köpflein Zöpflein
\nolig{eflig}{ef|lig}
 % schweflig
\nolig{flisch}{f|lisch}
 % teuflisch Tüpflischeißer
\nolig{iefla}{ief|la}
 % schieflachen Tieflage Tieflager
 % schieflaufen Brieflaufzeiten
\nolig{ieflieg}{ief|lieg}
 % Tieflieger
\nolig{iefländ}{ief|länd}
 % Tiefländer
\nolig{fläuf}{f|läuf}
 % Tiefläufer Aufläufe
\nolig{flöff}{f|löff}
 % Tieflöffelbagger auflöffeln
 % Schöpflöffel
\nolig{aflied}{af|lied}
 % Schlaflied
\nolig{lflos}{lf|los}
 % hilflos
\nolig{pfland}{pf|land}
 % Sumpfland
\nolig{pfleist}{pf|leist}
 % Dampfleistung Knopfleiste
 % Kopfleiste
\nolig{fleit}{f|leit}
 % Dampfleitung Hofleitung Baufhofleiter
 % Kaufleitung Notrufleitung aufleiten
 % inbegriffleitend Kraftstoffleitung

\keeplig{Kaltefleiter}
 % a surname...

\nolig{pfleu}{pf|leu}
 % Natriumdampfleuchten Kopfleuchte
\nolig{pflied}{pf|lied}
 % Kampflied
\nolig{pflok}{pf|lok}
 % Dampflokomotive
\nolig{mpflos}{mpf|los}
 % kampflos kopflos
\nolig{pflust}{pf|lust}
 % Kampflust Impflust
\nolig{pfländ}{pf|länd}
 % Sumpfländer
\nolig{ofland}{of|land}
 % Hoflandwirtschaft
\nolig{ofleb}{of|leb}
```

```
 % Hofleben
\nolig{ofländ}{of|länd}
 % hofländlich
\nolig{opflast}{opf|last}
 % kopflastig
\nolig{opfleb}{opf|leb}
 % Kopfleben, Druckkopflebensdauer
\nolig{opflos}{opf|los}
 % kopflos
\nolig{rfland}{rf|land}
 % Dorflandwirtschaft
\nolig{pfloch}{pf|loch}
 % Knopfloch
\nolig{pflöch}{pf|löch}
 % Knopflöcher
\nolig{flehr}{f|lehr}
 % Dorflehrer Eislauflehrerin
\nolig{rflig}{rf|lig}
 % würflig
\nolig{flohn}{f|lohn}
 % Tariflohn Tieflohnland
\nolig{flöhn}{f|löhn}
 % Tariflöhne
\nolig{fler}{f|ler}
 % Freiberufler Schaufler
 % Löffler Büffler Schnüffler
\nolig{uflach}{uf|lach}
 % auflachen
\nolig{oflad}{of|lad}
 % Biohofladen
\nolig{auflad}{auf|lad}
\nolig{Auflad}{Auf|lad}
 % aufladbar aufladen Sauf-laden
 % (Nicht 'uflad' direkt suchen, wegen
 % gewissen Wörtern die in 'ufladen'
 % enden.)
\nolig{orflad}{orf|lad}
 % Dorfladen
\nolig{urflad}{urf|lad}
 % Surfladen
\nolig{flage}{f|lage}
 % Auflage Rohstofflager Straflager
\nolig{ufland}{uf|land}
 % auflandig
\nolig{uflass}{uf|lass}
 % auflassen, auflassende
\nolig{uflauer}{uf|lauer}
 % auflauern, auflauerte
\nolig{flauf}{f|lauf}
 % Auflauf Auflauf[form]
\nolig{flaun}{f|laun}
 % Kauflaune Wurflaune Kampflaune
\nolig{uflaur}{uf|laur}
 % auflaure
\nolig{uflaß}{uf|laß}
 % auflaßt
\nolig{ufleb}{uf|leb}
 % auflebend
\nolig{ufleg}{uf|leg}
 % auflegend
\nolig{uflehn}{uf|lehn}
 % auflehnend
\nolig{ufleid}{uf|leid}
 % Kaufleidenschaft
\nolig{ufles}{uf|les}
 % auflesen
\nolig{ufleuch}{uf|leuch}
 % aufleuchten
\nolig{fleut}{f|leut}
 % Kaufleute Hofleute
\nolig{uflieg}{uf|lieg}
 % aufliegende
\nolig{aufliess}{auf|liess}
 % aufliesset
\nolig{aufließ}{auf|ließ}
 % aufließet
```

```
\nolig{Aufliess}{Auf|liess}
 % aufliesset
\nolig{Aufließ}{Auf|ließ}
 % aufließet
 %% be careful with "zufliessen"
\nolig{flist}{f|list}
 % auflisten Prüfliste
\nolig{uflock}{uf|lock}
 % auflockern
\nolig{flod}{f|lod}
 % auflodern
\nolig{uflos}{uf|los}
 % drauflos
\nolig{uflust}{uf|lust}
 % Kauflust, Rauflust
\nolig{ofläd}{of|läd}
 % Biohofläden
\nolig{rfläd}{rf|läd}
 % Dorfläden
\nolig{ufläd}{uf|läd}
 % Kaufläden auflädt
\nolig{uflös}{uf|lös}
 % Auflösung
\nolig{uflüd}{uf|lüd}
 % auflüde
\nolig{weifle}{weif|le}
 % bezweifle verzweifle
\nolig{weiflu}{weif|lu}
 % Verzweiflungsakt
\nolig{flich}{f|lich}
 % tariflich reiflich unbegreiflich
 % glimpflich schimpflich behilflich
 % brieflich verwerflich
 % sträflich gräflich markgräflich
 % beruflich nebenberuflich
 % käuflich unverkäuflich
 % höflich bischöflich
 % unerschöpflich dörflich
```

```
%% Need to avoid catching Pflicht and pflicht:
        \keeplig{Pflicht}
        \keeplig{pflicht}

\nolig{fling}{f|ling}
 % Prüfling Fünfling Sträfling Täufling



% 4. ffi -> f-fi
% --------------

\nolig{lffing}{lf|fing}
 % Zwölffingerdarm
\nolig{ffieb}{f|fieb}
 % Sumpffieber Wahlkampffieber
\nolig{nffing}{nf|fing}
 % fünffingrig
\nolig{uffiel}{uf|fiel}
 % auffielen
\nolig{uffind}{uf|find}
 % auffinden auffindbar
\nolig{uffing}{uf|fing}
 % auffing
\nolig{uffisch}{uf|fisch}
 % auffischen
\nolig{mpffisch}{mpf|fisch}
 % Kampffisch


% 5. ffi -> ff-i
% --------------

\nolig{offind}{off|ind}
 % Rohstoffindustrieller
\nolig{toffing}{toff|ing}
 % Baustoffingenieur Kunststoffingenieur
```

```
% 6. ffl -> ff-l
% --------------

%\nolig{fflich}{ff|lich}
% -- see \nolig{flich}{f|lich}
 % vortrefflich begrifflich
\nolig{fflig}{ff|lig}
 % knifflig mufflig
\nolig{offline}{off|line}
\nolig{Offline}{Off|line}
 % offline, Offline
\nolig{offlad}{off|lad}
 % Sprengstoffladung
\nolig{offleck}{off|leck}
 % Treibstoffleck
\nolig{offlief}{off|lief}
 % Brennstofflieferungen
\nolig{fflamp}{ff|lamp}
 % Kompaktleuchtstofflampe
\nolig{fflung}{ff|lung}
 % Stafflung
\nolig{ifflo}{iff|lo}
 % Schifflogbuch grifflos Griffloch
\nolig{offlo}{off|lo}
 % wirkstofflos Sauerstoffloch
\nolig{offlö}{off|lö}
 % Harnstofflösung Stofflöwe Sauerstofflöcher
\nolig{ffland}{ff|land}
 % Iffland Rifflandschaft Kunststofflandschaft
\nolig{fflast}{ff|last}
 % Rohstofflastigkeit Treibstofflaster


% 7. ffl -> f-fl
% --------------

\nolig{fflatt}{f|flatt}
 % aufflattern
\nolig{fflech}{f|flech}
 % aufflechten
\nolig{fflasch}{f|flasch}
 % Wegwerfflasche
\nolig{fflach}{f|flach}
 % Zwölfflach Fünfflach
\nolig{ffläch}{f|fläch}
 % Lauffläche Kampfflächen
 % Zwölfflächner (dodecahedron)
\nolig{fflut}{f|flut}
 % Briefflut
\nolig{ffleisch}{f|fleisch}
 % Schaffleisch
\nolig{fflimm}{f|flimm}
 % Vorhofflimmern
\nolig{fflug}{f|flug}
 % Chefflugleiter Tiefflug Kampfflugzeug
\nolig{fflieg}{f|flieg}
 % tiefliegend Kampfflieger
 % auffliegen
\nolig{iefflog}{ief|flog}
 % tiefflog
\nolig{fflüg}{f|flüg}
 % Tiefflüge Hofflügel
\nolig{pffl}{pf|fl}
 % Sumpffläche Sturzkampfflieger
\nolig{ufflack}{uf|flack}
 % aufflackern
\nolig{fflamm}{f|flamm}
 % aufflammen
\nolig{ufflog}{uf|flog}
 % aufflog
\nolig{ufflög}{uf|flög}
 % aufflöge
```

```
% 8. ft -> f-t
% ------------

%% Note use of %%%%% for words with an
%% Umlaut in first part of search string
%% (The comments will be removed once the
%% bugs in the lua code are removed.)

\nolig{aufta}{auf|ta}
\nolig{Aufta}{Auf|ta}
 % auftat Auftakt
\nolig{aufte}{auf|te}
\nolig{Aufte}{Auf|te}
 % aufteilen
\nolig{aufti}{auf|ti}
\nolig{Aufti}{Auf|ti}
 % auftischen
\nolig{aufto}{auf|to}
\nolig{Aufto}{Auf|to}
 % auftoupiern
\nolig{auftr}{auf|tr}
\nolig{Auftr}{Auf|tr}
 % auftreiben auftreten Sauftrottel
\nolig{auftu}{auf|tu}
\nolig{Auftu}{Auf|tu}
 % auftun
\nolig{auftä}{auf|tä}
\nolig{Auftä}{Auf|tä}
 % auftäten auftätowieren
\nolig{auftö}{auf|tö}
\nolig{Auftö}{Auf|tö}
 % herauftönen
\nolig{auftü}{auf|tü}
\nolig{Auftü}{Auf|tü}
 % auftürmen kauftüchtig
\nolig{aftat}{af|tat}
 % Straftat
\nolig{aftät}{af|tät}
 % Straftäter
\nolig{aftabl}{af|tabl}
 % Schlaftablette

\nolig{iefta}{ief|ta}
 % Brieftasche Brieftaube Tieftaucher
\nolig{iefte}{ief|te}
 % vertiefte verbriefte Brieftext

\nolig{lfte}{lf|te}
 % Hälfte elfte zwölfte
 % zwölfter elfter

%%%%%\nolig{fünfte}{ünf|te}
%%%%%\nolig{Fünfte}{Fünf|te}

%%%%%\nolig{üfte}{üf|te}
 % prüfte überprüfte

\nolig{rfte}{rf|te}
 % durfte bedurfte surfte
 % dürfte schlürfte unbedarfte
 % schärfte verschärfte

\nolig{lfto}{lf|to}
 % Zwölftonmusik Elftonner Golftour
\nolig{nftopf}{nf|topf}
 % Senftopf
\nolig{rftor}{rf|tor}
 % Freiwurftor
\nolig{rftou}{rf|tou}
 % Surftour

%%%%%\nolig{ünfter}{ünf|ter}
 % fünfter

\nolig{lftö}{lf|tö}
 %  zwölftönend
```

```
\nolig{nftö}{nf|tö}
 % Senftöpfchen
\nolig{rftö}{rf|tö}
 % Dorftölpel
\nolig{orftr}{orf|tr}
 % Dorftrottel Dorftratsch Dorftradition
\nolig{urftr}{urf|tr}
 % Wurftraining Surftrip Freiwurftreffer

\nolig{fton}{f|ton}
 % Pfeifton Zwölftonmusik Rufton
\nolig{urfta}{urf|ta}
 % Wurftalent Auswurftaste Surftalent

\nolig{ftyp}{f|typ}
 % Schifftyp, Cheftyp, Stofftyp
\nolig{ftyr}{f|tyr}
 % Dorftyrann

\nolig{ftrain}{f|train}
 % Cheftrainer Lauftrainer
\nolig{eiftr}{eif|tr}
 % Eingreiftruppe Nadelstreifträger
\nolig{eifte}{eif|te}
 % schleifte reifte seifte
\nolig{iefto}{ief|to}
 % Stieftochter Tiefton
\nolig{ieftö}{ief|tö}
 % Stieftöchter tieftönend
\nolig{ftrunk}{f|trunk}
 % schlaftrunken
\nolig{rftig}{rf|tig}
 % dürftig Surftipps

\nolig{ftag}{f|tag}
 % Tauftag Fünftagewoche
\nolig{nftause}{nf|tause}
 % fünftausend Fünftausender

\nolig{nftü}{nf|tü}
 % fünftürig Senftüte

\nolig{oftü}{of|tü}
 % Hoftür
\nolig{lfta}{lf|ta}
 % elftausend zwölftausend Golftasche
\nolig{uftas}{uf|tas}
 % Ruftaste Vorlauftaste
\nolig{uftax}{uf|tax}
 % Ruftaxi
\nolig{eftak}{ef|tak}
 % Cheftaktiker

\nolig{pfta}{pf|ta}
 % Wettkampftag Kampftaktik
 % wahlkampftauglich Schnupftabak
\nolig{pfte}{pf|te}
 % kämpfte schimpfte schrumpfte
 % klopfte schöpften
\nolig{pfti}{pf|ti}
 % Schimpftiraden Mehrkampftitel Stapftiefe
\nolig{pfto}{pf|to}
 % Dampftopf Sumpftour
\nolig{pftr}{pf|tr}
 % Kampftruppe Wettkampftrubel
 % Kopftreffer Zopfträger
\nolig{pftu}{pf|tu}
 % Kopftuch Schnupftuch
\nolig{pftä}{pf|tä}
 % Kampftätigkeit Kampftänzer
\nolig{pftö}{pf|tö}
 % Herzklopftöne Wahlkampftöne
\nolig{pftü}{pf|tü}
 % Kopftücher Kopftüchlein Schnupftücher

\nolig{ffta}{ff|ta}
 % Stofftasche Stofftapete Sauerstofftank
```

```
\nolig{ffte}{ff|te}
 % schaffte hoffte klaffte verpuffte
\nolig{ffti}{ff|ti}
 % Stofftier Stofftiger Stofftischtuch
\nolig{ffto}{ff|to}
 % Auspufftopf Kunststofftonne
\nolig{fftr}{ff|tr}
 % Stofftradition Stofftrennung
\nolig{fftu}{ff|tu}
 % Kunststofftube Stoffturnschuhe
\nolig{fftä}{ff|tä}
 % Stofftäschchen
\nolig{fftö}{ff|tö}
 % Auspufftöpfe Kunststofftöpfe
\nolig{fftü}{ff|tü}
 % Kunststofftüten

%%%%%\nolig{prüfte}{prüf|te}
%%%%%\nolig{Prüfte}{Prüf|te}



% 9. fb -> f-b, fh -> f-h, fk -> f-k
% ----------------------------------

 % Disable these ligatures globally.
 % I can't think of a single German word
 % for which these ligatures would not
 % cross a morpheme boundary.

\nolig{fb}{f|b}
\nolig{fh}{f|h}
\nolig{fk}{f|k}

 % However, there are some words (mainly proper
 % names) of non-German origin for which the
 % 'fk' ligature shouldn't be suppressed. Use
 % \keeplig macros to define such as cases.

    \keeplig{Kafka}
    \keeplig{kafka}
    \keeplig{Safka}
    \keeplig{Potrafke}
    \keeplig{Sprafke}
    \keeplig{Shirafkan}
    \keeplig{Tirafkan}
    \keeplig{Selfkant}



% 10. fj -> f-j
% -------------

% Suppress this ligature globally
\nolig{fj}{f|j}

 % Once more, there are some words of non-German
 % (e.g., Nordic and Slavic) origin for which the
 % 'fk' ligature shouldn't be suppressed. Use
 % \keeplig macros to define such as cases.

    \keeplig{fjord}
    \keeplig{fjell}
    \keeplig{Prokofjew}
    \keeplig{Sufjan}% Stevens
    \keeplig{Eefje} % Dutch first name
    \keeplig{fjäll} % Tegefjäll: Swedish skiing area
    \keeplig{Astafjew}
 % Russian author (Wiktor) and
 % soccer player (Maksim)
    \keeplig{fjör}
 % a bunch of Icelandic places catches both
 % German Isafjördur and Icelandic Ísafjörður
    \keeplig{Ísafjarðarbær} % city in Iceland
```

```
% 11. fff -> ff-f
% ---------------
 % Just in case there's a font that has a
 %    triple-f ligature:

\nolig{fff}{ff|f}
 % grifffest Stofffarbe Sprengstofffalle

 % This macro will also break up any 'fffl'
 % ligatures into 'ff' and 'fl' parts.
 % Example words: Sauerstoffflasche,
 %   Schliffläche, Stofffleck
 %   Kunststoffflügel, Kunststoffläche



% 12. Experimental and highly incomplete,
%%% and therefore commented out for now:
%%% Macros to suppress the th-ligature
%%%    for selected German words.

%\if@hdligset
%
%\nolig{thaft}{t|haft}
% % ernsthaft Heimathafen statthaft
%\nolig{thalt}{t|halt}
% % enthalten festhalten mithalten
%\nolig{thaub}{t|haub}
% % Zimthaube Fronthaube
%\nolig{thaus}{t|haus}
% % Rathaus Kunsthaus Gasthaus
%\nolig{thielt}{t|hielt}
% % enthielt
%\nolig{thalb}{t|halb}
% % anderthalb
%\nolig{thall}{t|hall}
% % Kunsthalle Sporthalle
%\nolig{theit}{t|heit}
% % Beliebtheit
%\nolig{thab}{t|hab}
% % Machthaber
%\nolig{thin}{t|hin}
% % weithin schlechthin mithin
%\nolig{thergang}{t|hergang}
% % Tathergang
%\nolig{thergeb}{t|hergeb}
% % althergebracht
%\nolig{thergeh}{t|hergeh}
% % weithergeholt
%\nolig{sther}{st|her}
% % selbsthergestellt selbstherrlich
%\fi
```

E Reporting bugs and other issues with the selnolig package: A suggested template

```
% !TEX TS-program = lualatex
% selnolig-bugreport.tex, 2012/11/15

\documentclass{article}
\usepackage[margin=1in]{geometry}
\usepackage{fontspec}

% Specify non-default text font, if any:
%\setmainfont{EB Garamond 12 Regular}
\setmainfont{Latin Modern Roman}

% comment out the next instruction if you don't use babel
\usepackage[ngerman]{babel}

% choose either ngerman or english as the language option
\usepackage[ngerman]{selnolig}

\begin{document}
\subsection*{Version of selnolig package used:}

(See the log file for this piece of information.)

\subsection*{Type-I errors: Words for which ligatures are incorrectly not being suppressed}

(List words here)

\subsection*{Type-II errors: Words for which ligatures are suppressed incorrectly}

(List words here)

\subsection*{Other issues}

Examples: problems with user guide; problems caused by the package's lua code
(and, please, suggestions for bug fixes)
\end{document}
```