The selnolig package: Selective suppression of typographic ligatures*

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2013/01/16

Abstract

The selnolig package lets users suppress typographic ligatures based on predefined search patterns. The search patterns focus on ligatures deemed inappropriate because they span morpheme boundaries. For example, the word `shelfful`, which is mentioned in the TEXbook as a word for which the "ff" ligature might be inappropriate, is automatically typeset as shelfful rather than as shelfful.

For English and German language documents, the selnolig package provides ligature suppression macros for the "common" f-ligatures. These comprise not only the familiar ff, fi, fl, ffi, and ffl ligatures but also the ft and fft ligatures.

For English language documents, the package further provides ligature suppression macros for a number of so-called "discretionary" and "historic" ligatures.

The selnolig package requires the LuaLATEX format provided by a reasonably modern TEX distribution such as TEXLive 2012, MacTEX 2012, or MiKTEX 2.9.

Contents

*Current version: 0.170. Features of the selnolig package are subject to change without prior notice.

The main text fonts used in this document are "Garamond Premier Pro" (for the most part) and "EB Garamond" (for the passages involving the fb, fh, fk, ffb, ffh, ffk, and *sk* ligatures). Both "common" and "discretionary" typographic ligatures are enabled for these two fonts—*and* suppressed selectively using selnolig's macros.

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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 offered up as one of the reasons for using these programs to obtain high-quality typeset output.

However, even though the automatic use of typographic ligatures is highly desirable 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: the first word component (or morpheme) ends 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 other languages, such as German, composite words are much more common; in these languages, there is naturally a much greater potential for composite words to feature f-f, f-l, and f-i (and other such character pairs and triples) across 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 elffach and kopflos (containing ff- and fl-ligatures) simply look wrong to a German reader; they should be typeset as elffach and kopflos, 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.

[1] For German texts, I believe that the *Duden* provides authoritative backing for questions related to selective ligature suppression. 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.

What has *not* been available so far is a LaTeX package that (a) provides a list of word patterns and entire words for which ligatures should be suppressed and (b) systematically discovers all instances of these patterns in a document and applies the non-ligation rules automatically to all words for which one or more pattern matches are found. 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 made—or can be made. The package attempts to make it fairly easy for users to provide additional ligature suppression rules to treat words not already covered by the package.[3]

For both English and German language documents, the selnolig package provides macros 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, if the package's `broadf` option is set, additional f-ligatures can be suppressed, e.g., for words that contain the fb, fh, fj, and fk character pairs. The package also features an option called `hdlig`. If this option is set, the package will suppress selectively historic and discretionary ligatures, such as those for the ct, st, sp, *sk*, *th*, *et*, and *as* character pairs.

For German language documents, all instances of fb, fh, fj, and fk ligatures are suppressed globally; see Section 6.5 for more details. However, exceptions are provided in order *not* to suppress these ligatures for selected words of *non-German* origin—such as fjord, Prokofjew, and Kafka. At this time, no macros for the selective suppression of historic and/or discretionary ligatures are provided for German language documents.

The selnolig package also provides supplemental hyphenation exception lists for both English and German language words. These words are generally composite and contain one more typographic ligatures that should be suppressed.

A remark 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 commands of the fontspec package, there appears to a near-complete lack of terminological standardization as to which typographic ligatures—beyond the so-called "common" ligatures (mainly f-ligatures)—are labelled "historic" and which ones are labelled "discretionary". The fonts Latin Modern Roman, Garamond Premier Pro, and Hoefler Text report having "only" discretionary ligatures, whereas Junicode, Cardo, EB Garamond, and Palatino Linotype report featuring both historic and discretionary ligatures. Interestingly, none of these fonts report having ligatures classified as either "contextual" or "required".

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

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}
  ```

  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 `broadf` 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.

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

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

  Synonymous options 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 ligature suppression macros of the selnolig package *require* the use of the LuaLaTeX format. They will *not* work with pdfLaTeX or XeLaTeX. One *can*—maybe at first a bit surprisingly—load the selnolig package under either pdfLaTeX or XeLaTeX. Be aware, though, that if you do so, only the package's hyphenation exception patterns will be loaded; the ligature suppression macros will

not be loaded because they are based on lua code. If the selnolig package is not run under LuaLaTeX, a warning message will be issued to alert the user that the package's ligature suppression macros won't be running.

The requirement to use LuaLaTeX in order to make use of the ligature suppression macros will likely force you to make some changes to your existing LaTeX documents. Fortunately, the required changes should be fairly minor and straightforward to implement, because LuaLaTeX is (for the most part) a strict superset of pdfLaTeX. Almost all documents that compile correctly under pdfLaTeX should also compile correctly under LuaLaTeX, as long as some relatively minor changes are made. The two main required changes are: (i) don't load the `inputenc` and `fontenc` packages, and (ii) insert the instruction

```
\usepackage{fontspec}
```

in the preamble. If the selnolig package is run under LuaLaTeX but the fontspec package isn't loaded by the time the `\begin{document}` statement is encountered, selnolig will terminate with an error message. It is recommended (but not required) that you load selnolig *after* fontspec and the latter package's font- and ligature-related commands.

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. The version of LuaLaTeX distributed with TeXLive 2011 is probably sufficiently recent to meet the package's requirements, but the version distributed with TeXLive 2009 is almost certainly not.

If you use a command-line interface to compile your document named, say, `myfile.tex`, be sure to type

```
lualatex myfile
```

rather than `latex myfile` (or `pdflatex myfile`). If you use an editor with pull-down menus or buttons to invoke a suitable TeX compiler for your document, be sure to select `LuaLaTeX`.

The very first time one runs LuaLaTeX on a document with a new set of fonts, the compilation speed will likely be quite slow because LuaLaTeX has to build various cache files to store 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 set up various font-related options in LuaLaTeX are subjects that go 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 set a multitude of font-related options.

The answers to the questions Frequently loaded packages: Differences between pdfLaTeX and LuaLaTeX? and Using LuaTeX as a replacement for pdf TeX, both posted to tex.stackexchange.com, provide some very useful information for people who are reasonably familiar with pdfLaTeX but are new to LuaLaTeX. Another great resource for people who would like to become more familiar with LuaLaTeX is A Guide to LuaLaTeX, written by Manuel Pégourié-Gonnard.

2.3 Anything else I need to do or know?

For multilingual support, LuaLaTeX and the selnolig package work well with the babel package. If your document loads the babel package, be sure to load the selnolig package *after* the babel package, so that the supplemental hyphenation patterns provided by the selnolig package won't get clobbered by babel's hyphenation settings. The selnolig package is also compatible with the hyphsubst package (which, if used, should be loaded with a `\RequirePackage` statement *before* the `\documentclass` instruction).

LuaLaTeX natively supports the so-called UTF-8 input encoding scheme. The selnolig package assumes that users make full use of this feature. Most modern TeX-aware editors support UTF-8 directly; legacy files, however, may use other input encoding systems. If your input files currently use a different input encoding scheme, such as LATIN1, you should consider changing them over to UTF-8. Several methods exist for changing a file's input encoding scheme; see the question How to change a .tex file's input encoding system (preferably to UTF-8)? and the associated answers on `tex.stackexchage.com` for some possibilities.

If your document is written in German, it is assumed that all vowels with diereses (Umlaute) are entered as ä, ö, ü, etc. rather than, say, 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}`.[4]

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

Finally, all babel-style `"|` ligature-suppressing shortcut instructions should either be removed entirely or replaced with `\breaklig` instructions. On my LuaLaTeX system (MacTeX 2012), whenever a `"|` command is encountered, a bad crash occurs that requires a reboot of the computer.

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`.[5] 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.

[4] Strictly speaking, the use of the input characters with "built-in" diereses is required only for the operations of the package's `\nolig` and `\keeplig` commands. However, if you're going to use the selnolig package, you may was well use ä, ö, and ü consistently throughout your document(s).

[5] 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`.

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 *early beta* versions of this package, uncovering bugs, pointing out unclear passages in the user guide, writing scripts to automate the discovery of syntactic errors in the package's `\nolig` and `\keeplig` instructions, 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.

Even more importantly, Felix and Steffen created scripts to systematically and comprehensively test the package's German `\nolig` and `\keeplig` macros for linguistic adequacy and (relative) completeness. They began with a corpus of almost 850 million [!!] words that were marked up with information on the morphemological constituents of each word. From this huge word list, they extracted a set of 462,000 unique word forms containing potential f-ligatures. According to their analyses, an initial version (ca. late October 2012) of the selnolig package dealt correctly with 85 percent (394,000) of those word forms, while still generating 21,000 Type I errors and 48,000 Type II errors.[6] (1000 words contained more than one potential ligature, hence the difference.) The detailed error lists they generated were critical in helping me refine the package's macros and thus bringing the number of errors down drastically. All major changes to the German language ligature suppression patterns are still being subjected to their testing algorithms to streamline the tasks of detecting what's left to improve and catching any newly introduced errors.

Felix and Steffen conducted this project for a term paper in a course in [XXX] at the University of Massachussetts at Amherst in the fall of 2012. This term paper is available online at [TBD]. 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. They also express their gratitude to the *Web-as-Corpus kool ynitiative* (*WaCky*) for letting them use the SDeWaC corpus,[7] as well as to Rajesh Bhatt (University of Massachusetts at 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 various f-ligatures should be suppressed. I created many of the initial German language ligature suppression rules of the selnolig package to treat the words listed in the rmligs package.[8]

Matthias Vogel very kindly informed me of a very useful and detailed set of macros, named Ligatures-German, which he wrote for the WinEdt programmer's editor, to suppress f-ligatures

[6] In the context of the selnolig package, a Type I error is the failure to suppress a typographically inappropriate ligature, and a Type II error is the suppression of a ligature that is actually appropriate.

[7] 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), pp. 209–226.

[8] 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.

by inserting the babel "| shortcut macro in the appropriate spots. Matthias' regular-expression based macros and a file he sent me containing a very extensive list of German words that need one or more f-ligatures suppressed led me to thoroughly refine and extend the scope of the selnolig's ligature-suppressing commands for German words.

Barbara Beeton provided careful and incisive comments on an early version of this user guide and the English-language ligature suppression macros. 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.

4 Structure of the package

4.1 Components of the package

The selnolig package has the following components:

- The main "driver" file is called selnolig.sty. It loads several other files and sets up the the package's main user macros, \nolig and \keeplig. These macros are explained in more detail in Section 4.2 below.
- The package's user macros rely on lua code contained in the file selnolig.lua.
- Extensive lists of non-ligation rules for English and German language documents are provided in the files selnolig-english-patterns.sty and selnolig-english-patterns.sty.
- Supplemental hyphenation exception patterns, mostly for words that involve one or more ligatures that are to be suppressed, are contained in the files selnolig-english-hyphex.sty and selnolig-english-hyphex.sty.
- A user guide (the document you're reading right now); the source code of the user guide is available in the file selnolig.tex.
- Ancillary files: 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.[9]

4.2 The package's user commands

The file selnolig.sty should be loaded with a `\usepackage` statement, generally with one or more options; see Section 6 for a discussion of the available options. After setting up several Boolean switches to structure the processing of options, the package next loads the file selnolig.lua, which contains the package's lua code.

The package then sets up several user macros which build on the lua code:

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}
   ```

   instructs LuaLaTeX to suppress automatically the ff-ligature in words such as "shelfful", "bookshelfful", and "selffulfilling".

   More than one ligature suppression point may be provided in the second argument of a `\nolig` instruction.[10]

   It is possible to use "wildcard" characters in the search string, as long as these characters occur after the non-ligation point. For example, the file selnolig-german-patterns.sty employs the instruction

   ```
   \nolig{Aufl[aäeioöuü]}{Auf|l}
   ```

   to search for words that start with `Aufl` followed by a vowel.[11] Incidentally, it is not absolutely necessary, in the second argument of the `\nolig` command, to provide any material *after* the vertical bar. However, the readability of the `\nolig` instructions may suffer if you suppress that material.

   If you examine the `\nolig` instructions provided in the files selnolig-german-patterns.sty and selnolig-english-patterns.sty, you'll notice quickly that there's some redundancy built

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

[10] For instance, one *could* specify `\nolig{Auflaufform}{Auf|lauf|form}` to suppress both the fl and the ff ligature in this word. As I note in Section 7.2, the selnolig package actually uses two separate `\nolig` commands to treat the ligatures in Auflaufform.

[11] This particular search string is used in order not to catch the abbreviated word "Aufl.", which does *not* get its fl-ligature suppressed.

into the package's ligature suppression rules. For instance, the need to suppress the ff-ligature in the German verb "auffallen" is catered to both by `\nolig{auff}{auf|f}` *and* by `\nolig{ffall}{f|fall}`. This redundancy is there by design, because not all words that might fit the first pattern will also fit the second pattern, and vice versa. Building in some redundancy seems like a reasonable way to proceed.

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 override `\nolig` instructions, by specifying words and word fragments for which typographic ligatures should *not* be suppressed anywhere in the document. For a `\keeplig` macro to work properly, its argument should be a word (or word fragment) that includes as a subset words (or word fragments) treated by `\nolig` instructions. It is permissible to use lua-type wildcard characters in the argument of `\keeplig`.

Having the `\keeplig` macro is very useful because it allows us to specify simpler, i.e., less restrictive, `\nolig` instructions: Any Type-II errors that may arise from having a slightly-too-broad `\nolig` macro can be addressed by providing judiciously chosen `\keeplig` macros.

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 the words brieflich, tariflich, trefflich, hilflich, verwerflich, beruflich, sträflich, höflich, glimpflich, unerschöpflich, Lauflicht, and begrifflich—and quite a few more words too. This macro is, unfortunately, 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 more restrictive `\nolig` macros just to avoid including the Pflicht- and pflicht-words, the package provides the commands

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

to override the action of the `\nolig{flich}{f|lich}` instruction for words that contain these two word fragments. Recall that the argument of `\keeplig` is case-sensitive; hence, two `\keeplig` instructions are needed.

Just as it is possible to override the action of a `\nolig` command with a subsequent `\keeplig` command, it is also possible to override the action of a `\keeplig` macro with a more specific `\nolig` command. For instance, it turns out that the two `\keeplig` commands stated in

the preceding paragraph are themselves a bit too broad because they also affect the typesetting of the composite word `Sumpflicht` (swamp light), for which the fl-ligature *should* be suppressed. To address this case, the file selnolig-german-patterns.sty provides the macro

```
\nolig{Sumpflicht}{Sumpf|licht}
```

Observe that we make use of the case sensitivity in the final `\nolig` instruction in order to avoid having it apply to words such as "Visumpflicht" (visa requirement).

3. The macro `\breaklig`, which doesn't take an argument, is provided as a hopefully easy-to-remember version of the low-level LaTeX command `\-\hspace{0pt}`. As its name suggests, you should insert this macro in places where you want to break up a ligature on an ad-hoc basis (and also wish to permit hyphenation to occur). 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*.[12]

Incidentally, the selnolig package does not provide a dedicated macro to override the action of a `\nolig` instruction on an ad hoc basis, i.e., to force the use of a typographic ligature on a one-off basis. The LaTeX command `\mbox{}` already caters to this need.

The final few steps in the startup 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 instructions `\nolig`, `\keeplig`, and `\breaklig`, but no 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.

[12] 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.

- If the user specifies both the `english` and `ngerman` options (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.

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 ligating character pairs and triples across morpheme boundaries can occur

- if two independent or "main" words (stems, 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; and
- between a main word and a suffix: shelfful/shelfful, dwarflike/dwarflike, kopflos/kopflos, and Zöpflein/Zöpflein.

The general rule for all of these cases is to suppress typographic ligatures that cross such morpheme boundaries. For German words, the following exceptions and adjustments apply:[13]

- 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 cases potentially giving rise to an fl-ligature at the juncture of a main word (Stammwort) and a suffix, preference is conventionally given to "how the syllables are pronounced and how a word would be hyphenated" (according to the Duden), leading to a suppression of the fl-ligature. For instance, the words schweflig (sulfurous), teuflisch (devilish), and Verzweiflung (despair) have their fl-ligatures suppressed even though in each case the f and l characters belong to the same underlying morpheme, viz., Schwef(e)l, Teuf(e)l, and Zweif(e)l. For these words, the morphemological suffixes are clearly -ig, -isch, and -ung, rather than -lig, -lisch, and -lung. Nevertheless, usage for these and similar cases would appear to be *not* to employ the fl-ligature.

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

This convention may also be taken to govern the typesetting of words such as knifflig (tricky) and mufflig (grouchy), as well as that of the first-person-singular forms of verbs such as büffeln, löffeln, schaufeln, stiefeln, verteufeln, and zweifeln: they are rendered *without* the fl-ligature, i.e., as büffle, löffle, schaufle, stiefle, verteufle, and zweifle, respectively.

- If a word could *end* with an fl-ligature even though the f and l technically belong to different morphemes (say, because of an abbreviation that's in effect), the fl-ligature *is* used. E.g., one writes Aufl. *with* an fl ligature. But, when spelled out, the word should be typeset without the fl ligature, i.e., as Auflage.

  This convention further suggests that it's permissible to use the ffi- and ffl-ligatures in abbreviated names such as Steffi and Steffl even though they do not involve a period.

- The convention mentioned in the preceding bullet point could also be taken to imply that the ft and fft ligatures may be used *if* they occur at the very ends of words and word stems—e.g., geschärft, Unbedarftheit, and gerafft (note that the word stems schärfen, Bedarf, and raffen do not end in a t)—but that they should be suppressed when -f-te, -f-ten, -f-tes, etc. suffixes are involved, as in gestreifte, schlürftest, and rafften; all of these suffixes form syllables that start with a "t". Note, however, the deliberately careful use of the expression "taken to imply" in the first sentence of this paragraph: I have so far *not* encountered any kind of authoritative discussion of this particular typographic concern. For now, the selnolig package *does not* break up the ft and fft ligatures in these cases. However, I am willing to change this setting if confronted with appropriate typographic arguments.

- Here's a separate case for which I have not yet found a clear rule. If a morpheme ends in "ft" (e.g., Saft and Luft) and is followed by a suffix that starts with an i, as in `saftig` and `luftig`, one could typeset these words as either as 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 the component syllables are pronounced and thus *not* use the ft-ligature, i.e., to typeset them as saftig and luftig. For now, the selnolig package implements the former option. As already noted, however, I have not yet found any authoritative references on how to treat this case. Clear guidance on this typographical issue would be much appreciated.

6 Package options and additional ligature-related matters

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.

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

6.2 Other package options

6.2.1 English language case: The `broadf` 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 `broadf` option is specified.

For English-language documents, only a fairly small number of the f-ligature suppression rules is enabled by default, i.e., if the `broadf` 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.[14] The same goes for the fl (ffl) ligature in words that end in f (ff) followed by -ly.[15] 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 `broadf` option explicitly.

My choices regarding which f-ligature suppression rules belong to the "basic-f" and "broadf" 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 of the file selnolig-english-patterns.sty, 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 ligatures, in words such as arctangent (better than arctangent), painstaking (better than painstaking), and display (better than display). 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

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

[15] Examples are aloofly and gruffly.

pair (which derives from the Greek letter ϕ, or φ) is pronounced like "f" and should not be obscured by a preceding ſp ligature.

Setting the `hdlig` option also enables ligature suppression rules for ligatures such as *th*, *at*, and *et*. These ligatures might occur in words such as *lighthouse* and *pothole*, *aromatherapy* and *albatross*, and *ninety* and *nonetheless*. Ligature suppression rules are provided for the following discretionary ligatures: *th*, *at*, *et*, *as*, *is*, *us*, *ſk*, *ll*, and *fr*. Part 3 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 the pre-emption of one typographic ligature by another ligature within the same morpheme. This issue is discussed in more detail in Section 6.6.

6.2.2 Disabling the package's supplementary 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 -f-ing, -ff-ing, -f-ier, -ff-ier, -f-ieſt, -f-less, -f-like, 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 the shorter of the two. This is because it is assumed that writers of German-language documents use the babel package while setting the option `ngerman` option (or one of the related options); doing so also loads ſpecialized hyphenation patterns suitable for German text.[16]

It is possible to inſtruct selnolig *not* to load the package's hyphenation exception liſts. You may want to do so, say, if you muſt use UK-English hyphenation patterns and therefore muſtn't make use of the US-English hyphenation patterns provided by the package. (To the beſt of my knowledge, though, moſt of the hyphenation patterns indicated in selnolig-english-hyphex.sty are common to UK and US English.) To skip loading the additional hyphenation patterns when invoking the selnolig package, you should ſpecify the option `noadditionalhyphenationpatterns`.[17]

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. That way, the selnolig package's additional hyphenation exception patterns won't be 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.

[16] As was already noted earlier, the selnolig package is also compatible with the hyphsubst package.

[17] I am obviously not trying to make it too easy to invoke this option …

6.3 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 words `Saufladen` and `Wachstube` may be constructed as `Sauf-laden`/`Sau-fladen` and as `Wachs-tube`/`Wach-stube`, respectively. 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. For words such as the ones given above, software isn't—and won't be for a quite a while to come—smart enough to "know" on its own which possible meaning is intended. Writers, of course, can choose to insert explicit hyphen characters to indicate unambiguously the intended meaning.

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\mbox{fl}aden` and `Wachs\breaklig tube`.

A related case is that of the word `Chefinnenleben`, which can be constructed as `Chefinnen-leben` (lives of female bosses) or as `Chef-innenleben` (inner life (or lives) of a boss): the particle "innen" could either be a suffix to "Chef" or a prefix to "Leben". The macros of the selnolig package are set up, by default, *not* to break up the fi ligature in words such as Chefin and Chefinnen, in keeping with the rule that the fi ligature is permitted if the suffix starts with an "i". In contrast, it will break up the fi ligature in the longer words Chefinnenleben and Chefinnenräume, as in these cases the assumption is that the `innen` particle acts as a prefix to the final part of the composite word. If that's *not* what you want, i.e., if you do mean to discuss various things pertaining to female bosses, be sure to use `\mbox{fi}` instructions where appropriate. Better yet, use hyphens and write the words in question either as Chef-Innenleben and Chef-Innenräume or as Chefinnen-Leben and Chefinnen-Räume, respectively.

6.4 How to provide additional ligature suppression patterns

As already noted, I do not 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 containing ligatures that ought to be suppressed but aren't caught, it is straightforward to create one or more new non-ligation rules to deal with the cases you've discovered.

Suppose, say, that you need to prepare a special edition of Thomas Mann's novel "Der Tod in Venedig" and that you have chosen to use an "Antiqua" (Roman) font since fewer and fewer people nowadays can manage with ease to read text set in a period-appropriate blackletter font.

During these preparations, you might notice that the novel contains the word `inbegriffleitend`[18] and that the selnolig package does not (yet) appear to include a macro to suppress the unwanted ffl-ligature for this word. To address this problem, while simultaneously creating a search pattern that will also catch cases of inappropriate ffl-ligatures in the (hopefully quite a bit 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 would now be typeset as inbegriffleitend, Jugendtreffleiter, and Kunststoffleitung.[19]

6.5 How to use the selnolig package to suppress certain ligatures *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.[20]

For instance, suppose that you are typesetting a Turkish text. The Turkish alphabet features both a dotted and a dotless i, *viz.*, "ı"; I understand that in Turkish typesetting practice, *no* fi and ffi ligatures should be employed in order not to create doubt regarding which "i" character follows the "f" character. However, other f-ligatures (such as ff, fl, and ffl) may presumably be employed, because doing so won't create similar readability and intelligibilty problems. To address the global need of not using fi and ffi ligatures while keeping all other f-ligatures in play, one could issue the command

```
\nolig{fi}{f|i}
```

in the preamble of the document.

Or, suppose 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}
```

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

[19] The file selnolig-german-patterns.sty provides the macro `\nolig{fleit}{f|leit}` to cover these and further words.

[20] 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`.

In fact, these commands are provided automatically if the package's `ngerman` option is set.[21] 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.

Of course, your document may contain some *non-German* language words as well, 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{fk}{f|k}` macro, you could write each instance of this word as `Ka\mbox{fk}a` to generate Kafka instead of Kafka. Alternatively—and this is the method 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 should not be broken up, i.e., the words should be typeset as Sognefjord and Dovrefjell, respectively. `\keeplig` macros are therefore provided for words containing the particles fjord, fjör, fjell, and fjäll as well as for names such as Eefje, Sufjan, Prokofjew, and Astafjew.

6.6 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.[22] 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 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.[23]

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[21] These four macros are also enabled if the selnolig package's `english` and `broadf` options are set.

[22] To be sure, the issue of ligature pre-emption is not limited to "discretionary" ligatures; it can also occur with "common" f-ligatures. Suppose that a certain font provides ff, fi, and fl ligatures but no ffi and ffl ligatures, and consider how words containing `ffi` and `ffl` character triples will be typeset. Left to its own devices, TEX would let the leading ff-ligature pre-empt the trailing fi- and fl-ligatures, resulting in typographically incorrect outcomes for words such as wolffish (better: wolffish), safflower (safflower), auffinden (auffinden) and Schaffleisch (Schaffleisch).

[23] For the Garamond Premier Pro text font, I've discovered the following preculiar 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 `fist` and `fish`), TEX gives preference to the trailing *is* ligature over the preceding *fi* ligature, causing these words to be typeset as *fish* and *fist*, respectively. I can't tell if this outcome is a conscious design feature or a bug.

For now, selnolig is set to override this behavior, i.e., to always give preference to the leading *fi* ligature over the trailing *is* ligature for words that contain the strings `fist` and `fish`; hence, they'll be rendered as *fiſt* and *fish*, respectively. Note that if the `broadf` option was set, this setting implies that words such as *deafish, dwarfish, elfish, oafish, selfish, unselfish,*

6.6.1 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*. Taking this matter to a (slight?!) extreme: Do you prefer the look of *Do fast feſtive fists foſter fuſtiness?* or that of *Do faſt feſtive fiſts foſter fuſtiness?*

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 the `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]

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

6.6.2 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

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wolfish, draffish, giraffish, gruffish, offish, raffish, sniffish, ſtandoffish, ſtiffish, and *toffish*, as well as the associated adverbs ending in *-ly*, will not feature an *is* ligature. Of course, if the `broadf` option is not in effect, the *fi* and *ffi* ligatures will automatically preempt the *is* ligature in these words.

[24] This case was already noted in Footnote 22, 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.

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*.

6.6.3 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 the *th* ligature. The same happens for words such as *bath*, *Kathryn*, and *pathology*. Given the commonness and the 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 `boat-hook`, 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 can be 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 for which the use of the *et* ligature would hence be unproblematic. To address this issue, `\keeplig` macros are 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.[26]

6.6.4 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

[26] 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.

as *atap* rather than as *atap*.[27] 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.[28] As such, the *et*-related ligature suppression rules already in place to deal with morpheme boundary crossing cases should suffice to catch these cases as well.

7 Further issues

7.1 Known bugs

Remark: The 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` directives do not appear to work properly on the final word in the argument of a TEX macro (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 macro'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` macros 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 the content of an `\item` directive in an `itemize` or `enumerate` environment *ends* with a word (including an associated punctuation mark) that contains a ligature that should be suppressed —i.e., if it is followed immediately by another `\item` directive or an `\end{itemize}` or `\end{enumerate}` statement—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.

[27] 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.

[28] Examples are *betake, betatter, bristletail, caretaker, cheetah, detach, detail, detain, dovetail, foretaste, horsetail, pretake, pretax, retable, retack, retard, retarget, timetable, whitetail,* and *wiretap*. Incidentally, the author of the selnolig package has a slight preference for seeing his surname typeset as *Loretan* rather than as *Loretan*...

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" item, such as `\vphantom{x}`, also works.

I'm not sure if the following matter constitutes a bug or "merely" a case of incompatibility between two packages. The selnolig package does not appear to interact well with the ngerman package; however, as was noted earlier, it interacts nicely with the babel package (with one or more of the `ngerman`, `german`, `austrian`, and `naustrian` options set). 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 Writing ancillary information about the package's activity 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. Incidentally, because of the built-in redundancy of some of the `\nolig` command, it is possible that more than one pattern match will be found for a given word. E.g., for the verb "auffahren", two separate `\nolig` commands simultaneously apply, and the following lines are written to the `.log` file:

```
pattern match: auffahren - auff
pattern match: auffahren - ffahr
Do ligature suppression for: auffahren
Inserting noliga whatsit before glyph: f
```

It is also possible that words are found with more than one ligature suppression point. For example, if the word "Auflaufform"—which happens to have both an fl- and an ff-ligature that should be suppressed—is encountered, the following lines are written to the `.log` file; note that in this case, two separate `\nolig` commands "catch" the fl and ff ligatures:

```
pattern match: Auflaufform - fform
pattern match: Auflaufform - Aufl[aäeioöuü]
pattern match: Auflaufform - auff
pattern match: Auflaufform - flauf
Do ligature suppression for: Auflaufform
Inserting noliga whatsit before glyph: l
Inserting noliga whatsit before glyph: f
```

If both a `\nolig` and a `\keeplig` command apply to a word, as for the word `fjord` (for which the macros `\nolig{fj}{f|j}` and `\keeplig{fjord}` apply), the following information is written to the `.log` file:

```
pattern match nolig and keeplig: fjord - fj - fjord
```

To terminate or suspend the writing of the debugging-related information to the `.log` file, one may execute the command `\debugoff`. Having the commands `\debugon` and `\debugoff` may be useful if you're writing your own `\nolig` and `\keeplig` commands and discover some ligature suppression problems which occur only in a small subset of your document. By bracketing this subset with a pair of `\debugon` and `\debugoff` commands, you limit the writing of debugging-related information to the `.log` file, making the amount of information you'll need to plow through (hopefully) quite manageable.

7.3 Suspending and restarting the operation of selnolig's macros

By default, selnolig's macros are switched on if the package is loaded. If you want to suspend their operation at some point in the document, you may issue the command

```
\selnoligoff
```

Conversely, if selnolig's macros need to be switched back on, you should issue the command

```
\selnoligon
```

Incidentally, encasing a `\selnoligoff` instruction inside a TEX "group"—something that's delimited by a pair of curly braces or by `\bgroup` and `\egroup` statements—will *not* switch selnolig's macros back on after the end of the TEX group is reached. This is because selnolig's main lua function is implemented as a callback routine. Adding this lua function to and removing it from the callback list, which is what `\selnoligon` and `\selnoligoff` do, is not affected by TEX groups. That's why it's necessary to issue a `\selnoligon` command to switch selnolig's macros back on.

7.4 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.[29] Obviously, I can't and won't make a claim that either of these lists is complete. Suggestions for additional words are always welcome.

[29] I started the list of German language words with the examples provided by the rmligs script, but have come up with quite a few more words since then.

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 LuaLaTeXbecause they make use of the selnolig package.

Appendices

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

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

% 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\selnoligpackagename{selnolig}
\def\selnoligpackageversion{0.170}
\def\selnoligpackagedate{2013/01/16}

% Announce who we are. Issue warning message if we're
% not running under LuaLaTeX, but don't exit entirely.

\typeout{=== Package \selnoligpackagename,
   Version \selnoligpackageversion,
   Date \selnoligpackagedate ===}
\ProvidesPackage{selnolig}[2013/01/16]

\RequirePackage{ifluatex}
\ifluatex
  \RequirePackage{luatexbase,luacode,expl3}
\else
  \typeout{ ===================================== }
  \typeout{      WARNING   WARNING    WARNING      }
  \typeout{ ------------------------------------- }
  \typeout{ The ligature suppression macros of the  }
  \typeout{ selnolig package *require* LuaLaTeX.    }
  \typeout{ Because you're NOT running this package }
```

```
  \typeout{ under LuaLaTeX, ligature suppression    }
  \typeout{ *cannot* be performed.                  }
  \typeout{ If any language options have been       }
  \typeout{ specified, the associated hyphenation   }
  \typeout{ exception patterns will be loaded.      }
  \typeout{=========================================}
\fi


% If the 'fontspec' package isn't loaded by the time
% the '\begin{document}' directive is encoutered, issue
% an error message and exit.

\AtBeginDocument{%
\ifluatex
  \@ifpackageloaded{fontspec}{}{%
  \PackageError{selnolig}{%
     ========================================= \MessageBreak
          Error Alert      Error Alert          \MessageBreak
     ----------------------------------------- \MessageBreak
     The selnolig package *requires* the        \MessageBreak
     'fontspec' package, but it hasn't been     \MessageBreak
     loaded. Exiting now.                       \MessageBreak
     ==========================================}
     {See section 2.2 of selnolig's user guide for more information.}
  }
\fi
}

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

% The main language options are 'english' and 'german'.
% We provide the option 'otherlang' option just in case
% a user 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}
% synonymous option:
  \DeclareOption{otherlanguage}{\@otherlangtrue}


% For English, the default is to load only a fairly basic
% set of non-ligation rules pertaining to f-ligatures.
% Among them are the "standard five" (ff, fi, fl, ffi,
% and ffl) ligatures as well as the ft ligature.
%
% Two options to override this "basic" setting:
% - broadf  Many more non-ligation rules for f-ligatures,
%           incl. fb, fh, fj, and fk character pairs.
% - hdlig   Additional ligature suppression 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@broadfset\@broadfsetfalse
\DeclareOption{broadf}{\@broadfsettrue}
```

```
\newif\if@hdligset\@hdligsetfalse
\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@addlhyph\@addlhyphtrue
\DeclareOption{noadditionalhyphenationpatterns}{\@addlhyphfalse}


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

\DeclareOption{basic}{\@broadfsetfalse\@hdligsetfalse}


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

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

% Finally, process all options
\ProcessOptions\relax



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

\ifluatex
  % Load the lua code contained in 'selnolig.lua'.
  \directlua{  require("selnolig.lua")  }

  % Commands to switch selnolig's routines on and off
```

```
  \newcommand\selnoligon{
    \directlua{ enableselnolig() }
  }

  \newcommand\selnoligoff{
    \directlua{ disableselnolig() }
  }

  % By default, selnolig's macros are switched on
  \selnoligon

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

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

  \newcommand\debugoff{%
     \directlua{ debug=false }
  }

  % 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}" )
     }
  }

\else
  % If *not* running under LuaLaTeX, provide dummy
  % definitions for package's user macros.
```

```
  \newcommand{\nolig}[2]{}
  \newcommand{\keeplig}[1]{}
  \let\selnoligon\relax
  \let\selnoligoff\relax
  \let\debugon\relax
  \let\debugoff\relax
\fi


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



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

\if@english
   % load English-language ligature suppression rules
   \ifluatex
      \RequirePackage{selnolig-english-patterns}
   \fi

   % load additional hyphenation exception patterns
   \if@addlhyph
      \RequirePackage{selnolig-english-hyphex}
   \fi
\fi


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

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

   % load additional hyphenation exception patterns
```

```
   \if@addlhyph
      \RequirePackage{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 of Taco Hoekwater,
--    Patrick Gundlach, and Steffen Hildebrandt)
-- Date: 2013/01/16
--
-- 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".


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

  -- Problem: string.find and unicode.utf8.find return
  -- the byte-position at which the pattern is found
  -- instead of the character-position. Fix this by
  -- providing a dedicated string search function.

local unicode_find = function(s, pattern, position)
  -- Strart by correcting the incoming position
  if position ~= nil then
    debug_info("Position: "..position)
    sub = string.sub(s, 1, position)
    position=position+string.len(sub) - unicode.utf8.len(sub)
    debug_info("Corrected position: "..position)
  end
  -- Now execute find and fix it accordingly
  byte_pos = unicode.utf8.find(s, pattern, position)
  if byte_pos ~= nil then
    -- "convert" byte_pos to "unicode_pos"
    return unicode.utf8.len( string.sub(s, 1, byte_pos) )
  else
    return nil
  end
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= unicode_find(noliga[v[3]],"|")
      local correction=1
      while c~=nil do
```

```
      --debug_info("Position "..(v[1]+c))
      p[v[1]+c-correction] = 1
      c = unicode_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

function enableselnolig()
  luatexbase.add_to_callback( "ligaturing",
    process_ligatures, "Suppress ligatures", 1 )
end

function disableselnolig()
  luatexbase.remove_from_callback( "ligaturing",
    "Suppress ligatures" )
end
```

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

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

\ProvidesPackage{selnolig-english-patterns}%
[2013/01/16]

% 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: "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

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


% (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}
 % fifth(s)
\nolig{elfth}{elf|th}
 % 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@broadfset

% (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 stuffies ...
 % 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
 % nothing additional in 'broad' group
```

```
% (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
% exceptions 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@broadfset block




% Part 3: Discretionary ligatures crossing
% morpheme boundaries
% st, ct, 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{distil}{dis|til}
\nolig{Distil}{Dis|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

\nolig{esthet}{es|thet}
\nolig{aesthet}{aes|thet}
\nolig{Esthet}{Es|thet}
\nolig{Aesthet}{Aes|thet}
 % aesthetic esthetic unesthetic

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

\nolig{rctan}{rc|tan}
 % arctangent
\nolig{rctat}{rc|tat}
 % coarctation

% (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{rathol}{rat|hol}
\nolig{Rathol}{Rat|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{orthol}{ort|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{betat}{be|tat}
\nolig{Betat}{Be|tat}
 % 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{etax}{e|tax}
 % betax
\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{aspec}{a|spec}
\nolig{Aspec}{A|spec}
 % aspect infraspecific intraspecies
 % intraspecific
\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
\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{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{lasp}{la|sp}
 % clasp unclasp beclasp enclasp
\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,
% etc., and the 'et' ligature in words such as
% Beethoven, prophethood, and sweetheart.
% To address these cases, we provide \keeplig
% macros:

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

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

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

\nolig{Loretan}{Lore|tan} % :-)

% All other cases 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 \@ifhdligset
```

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

Introductory note: 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 equivalent search-and-insert strings containing "ss".

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

\ProvidesPackage{selnolig-german-patterns}%
[2013/01/16]

% 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)


% A note on the organization of the \nolig
% macros in this file: They are grouped by
% the f-ligature being suppressed: ff -> f-f;
% fi -> f-i, fl -> f-l, etc.  Within each of
% these sections, the \nolig commands are
% listed first for word-beginnings and
% second by word-interior search strings,
% alphabetically within each group.


% 1. ff -> f-f
% ------------

\nolig{Brieff}{Brief|f}
\nolig{brieff}{brief|f}
  % Brief-f... (viele Fälle!)
\nolig{Cheff}{Chef|f}
\nolig{cheff[aäeioöruü]}{chef|f}
  % Cheffahrer Cheffront ...
  \keeplig{cheffekt} % Lacheffekt Wischeffekt
  \keeplig{Scheffel}
  \keeplig{scheffel} % scheffeln
  \keeplig{cheffizi} % hocheffizient
  \keeplig{cheffé} % Scheffé (Statistiker)
\nolig{Dampff}{Dampf|f}
\nolig{dampff}{dampf|f}
  % (viele Fälle!)
\nolig{Dorff[aäeiloöruü]}{Dorf|f}
\nolig{dorff[aäeiloöruü]}{dorf|f}
  % (viele Fälle!)
\nolig{Hanff}{Hanf|f}
\nolig{hanff}{hanf|f}
  % Hanffasern Hanffeld
\nolig{Hoff[aäiloöruü]}{Hof|f}
  % (viele Fälle!)
  \keeplig{Hoffacker}
  \keeplig{Hoffart}
  \keeplig{Hoffärt}   % Hoffärtigkeit
  \keeplig{Hoffricht} % Hoffrichter
  \keeplig{Hoffranz}  % Hoffranzen (?)

\nolig{Golff}{Golf|f}
\nolig{golff}{golf|f}
  % (viele Fälle!)
```

```
\nolig{Hoffern}{Hof|fern}
\nolig{hoffern}{hof|fern}
  % Hofferne hofferner
\nolig{Impff}{Impf|f}
  % Impffurcht Impffortbildung
\nolig{Kampff}{Kampf|f}
\nolig{kampff}{kampf|f}
  % kampffertig Kampffigur
  % Kampffuchs Kampffüchse
\nolig{Kopff[aäeoöruü]}{Kopf|f}
\nolig{kopff[aäeoöruü]}{kopf|f}
  % (viele Fälle!)
  % [kK]opffi -> caught by pffi rule
  % [kK]opffl -> caught by pffl rule
\nolig{Klopff}{Klopf|f}
\nolig{klopff}{klopf|f}
  % Schenkelklopffrohsinn klopfrei
\nolig{Prüff}{Prüf|f}
\nolig{prüff}{prüf|f}
  % (viele Fälle!)
\nolig{Ruffach}{Ruf|fach}
  % Ruffach
\nolig{ruffach}{ruf|fach}
  % Hausnotruffachberater beruffachlichen
\nolig{Rumpff}{Rumpf|f}
  % Rumpffassung
\nolig{Schaffang}{Schaf|fang}
\nolig{Schaffarm}{Schaf|farm}
\nolig{Schaffell}{Schaf|fell}



\nolig{Schilff}{Schilf|f}
\nolig{schilff}{schilf|f}
  % Schilffeld Schilfflöte Schilffloß
\nolig{Senff}{Senf|f}
\nolig{senffa}{senf|fa}
  % Senffabrik senffarbig Senffleck
\nolig{Sumpff}{Sumpf|f}
\nolig{sumpff}{sumpf|f}
  % (viele Fälle!)
\nolig{Tariff}{Tarif|f}
\nolig{tariff}{tarif|f}
  % (viele Fälle!)
\nolig{Tieff}{Tief|f}
\nolig{tieff}{tief|f}
  % (viele Fälle!)
  \keeplig{tieffekt} % Multieffekt Konfettieffekt
  \keeplig{tieffiz}  % Antieffizienz

\nolig{Auff}{Auf|f}
\nolig{auff}{auf|f}
  % Hundreds (thousands?) or words that start
  % with or contain [aA]uff-, [kK]auff-, [lL]auf-.
  % We must provide a few \keeplig macros,
  % though, to deal with some surnames and
  % some words of French origin.
  \keeplig{Hauff}
  \keeplig{Lauffen}
  \keeplig{Stauffach}  % Stauffacher
  \keeplig{Stauffen}   % Stauffenbergattentat
  \keeplig{Stauffer}
  \keeplig{Stauffisch}
  \keeplig{stauffisch}

  \keeplig{chauffier}
  \keeplig{Chauffier}
  \keeplig{chauffeur}
  \keeplig{Chauffeur}
  \keeplig{chauffement} % Echauffement

\nolig{eiffest}{eif|fest}
  % reiffest

\nolig{ffabrik}{f|fabrik}
  % Strumpffabrik
\nolig{ffacet}{f|facet}
```

```
  % Relieffacetten
\nolig{ffachl}{f|fachl}
  % beruffachlich golffachlich
\nolig{ffachm}{f|fachm}
  % Huffachmann Wahlkampffachmann
  % Golffachmesse Fünffachmord
\nolig{ffäch}{f|fäch}
  % Brieffächer Einwurffächer fünffächrig
\nolig{ffaden}{f|faden}
  % Einzelknopffaden Knüpffaden
\nolig{ffäd}{f|fäd}
  % Einzelknopffäden Tropffäden
\nolig{ffähig}{f|fähig}
  % hoffähig kampffähig lauffähig
\nolig{ffahn}{f|fahn}
  % Totenkopffahne Dorffahne Wahlkampffahnen
\nolig{ffahr}{f|fahr}
  % Schifffahrt Schleiffahrt Tariffahrplan
\nolig{ffähr}{f|fähr}
  % Dampffährdienst
\nolig{ffaktor}{f|faktor}
  % Hoffaktor Schlupffaktoren
\nolig{ffakult}{f|fakult}
  % Rumpffakultät
\nolig{ffall}{f|fall}
  % Anruffalle auffallen Straffall
  % Tariffalle Streiffall Maulwurffalle
  \keeplig{ffallee}  % Oppenhoffallee
  \keeplig{ffallerg} % Duftstoffallergie
\nolig{ffäll}{f|fäll}
  % straffällig unauffällig
\nolig{ffalt}{f|falt}
  % Fünffaltigkeit Dickkopffalter
  \keeplig{iffalt} % Segelschiffalter
  \keeplig{offalt} % Kraftstoffalternativen
\nolig{ffält}{f|fält}
  % fünffältig
\nolig{ffami}{f|fami}
  % Zwölffamilienhäuser
  \keeplig{Diffami} % Diffamierung
  \keeplig{diffami} % diffamierend
\nolig{ffanat}{f|fanat}
  % Schärffanatiker
%%%\nolig{ffanlag}{f|fanlage}
%%%  % Wolffanlage (?)
\nolig{ffans}{f|fans}
  % Waldhoffans
  \keeplig{riffans} % Griffansätze
  \keeplig{toffans} % Sprengstoffanschlag
\nolig{ffanta}{f|fanta}
  % Schlaffantasie Straffantasie
\nolig{ffarb}{f|farb}
  % Zwölffarbenmaschine zwölffarbig
  \keeplig{ffarbeit}
\nolig{ffärb}{f|färb}
  % Kopffärbung
\nolig{ffaschi}{f|faschi}
  % Schulhoffaschismus
\nolig{ffassad}{f|fassad}
  % Innenhoffassade
\nolig{ffäul}{f|fäul}
  % Sumpffäulnis

\nolig{ffecht}{f|fecht}
  % Klopffechter
\nolig{ffeder}{f|feder}
  % -f-feder...
\nolig{ffedr}{f|fedr}
  % zwölffedrig
\nolig{ffehl}{f|fehl}
  % Schärffehler
\nolig{ffeier}{f|feier}
  % Hoffeierlichkeiten
\nolig{ffeind[els]}{f|feind}
  % -f-feinde -f-feindlich -f-feindschaft
  \keeplig{ffeindealer} % Koffeindealer
```

```
\nolig{ffeld}{f|feld}
  % Prüffeld Schilffeld Kampffeld
  \keeplig{Büffeld}   % Büffeldecke
  \keeplig{büffeld}
  \keeplig{ffeldenk}  % Scheffeldenkmal
  \keeplig{Iffeld}    % Iffeldorf
  \keeplig{Löffeld}   % Löffeldüngung
  \keeplig{löffeld}
  \keeplig{Müffeld}   % Müffeldoktor
  \keeplig{müffeld}
  \keeplig{nüffeld}   % Schnüffeldienst -droge
  \keeplig{taffeld}   % Staffeldach -diplomatie
  \keeplig{toffeld}   % Kartoffeldruck -dieb
  \keeplig{Trüffeld}  % Trüffelduft -dorf
  \keeplig{trüffeld}
  \keeplig{Waffeld}   % Waffelduft
  \keeplig{waffeld}

\nolig{ffell}{f|fell}
  % Werwolffell Schaffell
  \keeplig{ffellinde}% Scheffellinde
  \keeplig{Muffellä} % Muffellämmer
  \keeplig{öffell}  % Löffellamm Kochlöffellängen
  \keeplig{taffell} % Staffellauf -läufer
  \keeplig{toffell} % Kartoffellager -liebhaber
                    % Pantoffellarve
                    % Kunstoffelle
  \keeplig{üffell}  % Büffelleber -leder -leib
                    % Trüffelleidenschaft
                    % Schnüffellust
  \keeplig{ffelleck}% Waffelleckereien
\nolig{ffeile}{f|feile}
  % Prüffeile
\nolig{ffenster}{f|fenster}
  % Hinterhoffenster Schlaf- Tarif-
\nolig{fferien}{f|ferien}
  % Reiterhofferien Bauernhofferien
\nolig{ffertig}{f|fertig}
  % schlaffertig
\nolig{ffestl}{f|festl}
  % Straffestlegung
\nolig{ffests}{f|fests}
  % Straffestsetzung
  % Hoffestspiele Dorffestspiel
\nolig{ffett}{f|fett}
  % Huffett Rumpffett Scharffetter
  \keeplig{Buffett}  % Buffettheke
  \keeplig{Büffett}
  \keeplig{buffett}
  \keeplig{büffett}  % Obstbüffett
\nolig{ffetz}{f|fetz}
  % Brieffetzen Stofffetzen
  \keeplig{Buffetz}  % Buffetzeit
  \keeplig{Büffetz}  % Büffetzusammenstellung
\nolig{ffeud}{f|feud}
  % Kasernenhoffeudalismus
\nolig{ffeue}{f|feue}
  % Dorffeuerwehr Torffeuer Lauffeuer
\nolig{ffilet}{f|filet}
  % Meerwolffilet
\nolig{ffindung}{f|findung}
  % Beruffindungsprozess
\nolig{ffirm}{f|firm}
  % Brieffirmen Tariffirmen
  \keeplig{affirm}
  \keeplig{Affirm}

\nolig{ffolg}{f|folg}
  % Impffolgen
\nolig{ffoli}{f|foli}
  % Relieffolien
\nolig{ffolter}{f|folter}
  % Tropffolter
  \keeplig{Affoltern} % Ortschaft nahe Zürich
\nolig{ffond}{f|fond}
  % Tariffondslösung
```

```
\nolig{fforder}{f|forder}
  % Tarifforderung Strafforderung
\nolig{fförder}{f|förder}
  % rufförderndnd kreislauffördernd schlafförderndnd
\nolig{fforell}{f|forell}
  % Werfforellen
\nolig{fform}{f|form}
  % Kopfform Gugelhupfform aufformen
\nolig{fförm}{f|förm}
  % reiffömig schweiffömig
\nolig{fforsch}{f|forsch}
  % Schlafforschung Impfforschung
\nolig{fforen}{f|foren}
  % Abrufforen
\nolig{fforu}{f|foru}
  % Schlafforum
\nolig{ffoto}{f|foto}
  % Schlaffotogalerie
\nolig{fföt}{f|föt}
  % Wolffötus

\nolig{ffracht}{f|fracht}
  % Dampffrachter
\nolig{ffrag}{f|frag}
  % Streiffragen
  \keeplig{Suffrage}  % Suffragette
  \keeplig{suffrage}
\nolig{ffrak}{f|frak}
  % Rumpffraktion
  \keeplig{toffrak} % Flüssigstoffrakete
\nolig{ffrank}{f|frank}
  % Fünffrankenstück
\nolig{ffräs}{f|fräs}
  % Baumstumpffräse
\nolig{ffrau}{f|frau}
  % Hoffrau Kauffrau
  \keeplig{ffraum} % Sprengstoffraub
  \keeplig{ffraub} % Treffraum
  \keeplig{ffrausch} % Klebstoffrausch
  \keeplig{ffraup} % Stoffraupe

\nolig{ffreak}{f|freak}
  % Surffreak
  \keeplig{toffreak} % Schadstoffreaktionen
\nolig{ffregat}{f|fregat}
  % Kampffregatte Dampffregatte
\nolig{ffrei}{f|frei}
  % tariffrei Schlaffrei
  \keeplig{chiffrei} % Schiffreise
  \keeplig{toffrei}  % stoffrein sauerstoffreich
  \keeplig{uffreis}  % Puffreis
\nolig{ffremd}{f|fremd}
  % hoffremd
\nolig{ffreq}{f|freq}
  % Schlaffrequenz
\nolig{ffreu}{f|freu}
  % Straffreude Brieffreund

\nolig{ffrisch}{f|frisch}
  % Schaffrischkäse zapffrisch
\nolig{ffried}{f|fried}
  % Dorffrieden Dorffrieden
\nolig{ffries}{f|fries}
  % Relieffries
  \keeplig{toffries} % Rohstoffriese
\nolig{ffrist}{f|frist}
  % Prüffrist Ablauffrist
\nolig{ffrisur}{f|frisur}
  % Schlaffrisur Topffrisur Zopffrisur

\nolig{ffront}{f|front}
  % Hoffront Kampffront
  \keeplig{affront}
  \keeplig{Affront}
\nolig{ffrosch}{f|frosch}
  % Pfeiffrosch
```

```
\nolig{ffrösch}{f|frösch}
  % Pfeiffrösche
\nolig{ffrucht}{f|frucht}
  % Rumtopffrucht
\nolig{ffrücht}{f|frücht}
  % Rumtopffrüchte

\nolig{ffund}{f|fund}
  % Brückenkopffundament
  \keeplig{iffund}  % diffundieren
  \keeplig{toffund} % stoffundurchlässig
\nolig{fführ}{f|führ}
  % Kampfführung aufführen
\nolig{ffunk}{f|funk}
  % Brieffunktion Abruffunktion
\nolig{ffühl}{f|fühl}
  % Scharffühler
\nolig{ffüll}{f|füll}
  % Prüffüllgut Dampffüllung
\nolig{ffürst}{f|fürst}
  % -f-fürst
\nolig{ffuß}{f|fuß}
\nolig{ffuss}{f|fuss}
\nolig{ffüß}{f|füß}
\nolig{ffüss}{f|füss}
  % Greiffuß Greiffüße
  \keeplig{iffuss} % Diffusschall -strahlung
\nolig{ffutter}{f|futter}
  % Prüffutter
\nolig{ffütter}{f|fütter}
  % Abruffütterung

\nolig{hoffan}{hof|fan}
  % Waldhoffan
\nolig{hoffersch}{hof|fersch}
  % Talhofferschen
\nolig{hoffest}{hof|fest}
  % Pfarrhoffest Hinterhoffest

\nolig{hoffete}{hof|fete}
  % Schneckenhoffete

\nolig{lffach}{lf|fach}
  % elffach zwölffach

\nolig{pffach}{pf|fach}
  % Strumpffach
\nolig{pffest}{pf|fest}
  % Klopffestigkeit tropffester
\nolig{pffels}{pf|fels}
  % Hirschkopffelsen
\nolig{pffont}{pf|font}
  % Dampffontäne
\nolig{pffüh}{pf|füh}
  % Kampfführung

\nolig{reiffern}{reif|fern}
  % reiffern
\nolig{rffan}{rf|fan}
  % Surffan
\nolig{rffeel}{rf|feel}
  % Surffeeling
\nolig{rffest}{rf|fest}
  % Surffest
\nolig{rffinn}{rf|finn}
  % Surffinne
\nolig{rffleck}{rf|fleck}
  % Schorfflecken

\nolig{ünff}{ünf|f}
  % fünfflügelig Fünfflach fünfflammig
  % fünffleckige fünffingrig fünffarbig

\nolig{wurff[aäehiloöruü]}{wurf|f}
  % Einwurffehler Auswurffach Hammerwurffinale
```

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

\nolig{Aufi}{Auf|i}
\nolig{aufisst}{auf|isst}

\nolig{Briefi}{Brief|i}
\nolig{briefi}{brief|i}
  % Briefidiom Briefinhalt Pfandbriefinhaber

\nolig{Chefi}{Chef|i}
\nolig{chefi}{chef|i}
  % Chefideologe Chefindianer Chefinformatiker
  \keeplig{Chefin}  % Chefin Chefinnen
    \nolig{Chefin[a-mo-z]}{Chef|in}
    % Chefinder -indianer -inspektor -inquisitor
  \keeplig{chefin}
     \nolig{chefind}{chef|ind}
  \keeplig{chefibel} % Rererchefibel
  \keeplig{chefiebe} % Rererchefieber
  \keeplig{chefigur} % Nietzschefigur
  \keeplig{chefilm}  % Rachefilm
  \keeplig{chefili}  % Wäschefiliale
  \keeplig{chefirm}  % Geldwäschefirma
  \keeplig{chefisch} % Wäschefische

\nolig{Dorfi}{Dorf|i}
\nolig{dorfi}{dorf|i}
  % Dorfidylle Dorfinformation Dorfinstitute
\nolig{Hofi}{Hof|i}
  % (viele Fälle!)
  \keeplig{Hofier} % Hofieren
\nolig{Kampfi}{Kampf|i}
\nolig{kampfi}{kampf|i}
  % Kampfideologie Kampfinstrument
\nolig{Kaufi}{Kauf|i}
\nolig{kaufi}{kauf|i}
  % Kaufidee kaufinteressiert Kaufimpuls

\nolig{Laufi}{Lauf|i}
\nolig{laufi}{lauf|i}
  % Laufidol Kreislaufinsuffizienz
  \keeplig{Laufig}
\nolig{rüfi}{rüf|i}
  % Prüfinhalt Prüfinstitution Prüfintervall
\nolig{Rumpfi}{Rumpf|i}
\nolig{rumpfi}{rumpf|i}
  % Rumpfitalien Strumpfindustrie
  \keeplig{rumpfig}

\nolig{chafi}{chaf|i} % Schaf-i...
  % Schafimperium Schafinnereien
  \keeplig{schafigu} % Maharadschafigur
\nolig{chlafi}{chlaf|i} % Schlaf-i-...
  % Schlafiglu schlafinduzierend
  \keeplig{chlafitt} % Schlafittchen

\nolig{Strafi}{Straf|i}
\nolig{strafi}{straf|i}
  % strafisolierend Strafinstanz
\nolig{Tarifi}{Tarif|i}
\nolig{tarifi}{tarif|i}
  % (viele Fälle!)
  \keeplig{Tarifier} % Tarifierung
  \keeplig{tarifier} % tarifierbar
\nolig{Tiefinn}{Tief|inn}
\nolig{tiefinn}{tief|inn}
  % tiefinnen -innerste -innig -innerste

\nolig{fidee}{f|idee}
  % Kopfidee Luftschiffidee
\nolig{fideol}{f|ideol}
  % Tiefideologie
\nolig{fidentif}{f|identif}
  % Stoffidentifizierung
\nolig{fidentit}{f|identit}
  % Steppenwolfidentität Berufidentität
```

```
\nolig{fidol}{f|idol}
  % Golfidol
\nolig{fidyll}{f|idyll}
  % Bauernhofidyll
\nolig{figel}{f|igel}
  % Köpfigel Stoffigel
  \keeplig{figelehrt} % Sufigelehrter
\nolig{fikone}{f|ikone}
  % Laufikone
\nolig{fillus}{f|illus}
  % Sumpfillusion
\nolig{fimman}{f|imman}
  % ablaufimmanente
\nolig{fimmob}{f|immob}
  % Kaufhofimmobilie
\nolig{fimmun}{f|immun}
  % Strafimmunität
\nolig{fimp}{f|imp}
  % Torfimporte Kaufimpuls aufimpft

\nolig{findex}{f|index}
  % Kaufindex Pfandbriefindex
\nolig{findikat}{f|indikat}
  % Impfindikation
\nolig{findiv}{f|indiv}
  % Hofindividualität
\nolig{findiz}{f|indiz}
  % Tarifindizes
\nolig{findust}{f|indust}
  % Golfindustrie
\nolig{finfekt}{f|infekt}
  % Dampfinfektion
\nolig{finfiz}{f|infiz}
  % Laufinfizierte
\nolig{finfo}{f|info}
  % Tarifinformation Telefoninformation
  \keeplig{Delfinfo} % Delfinforscher -foto
\nolig{finfra}{f|infra}
  % Hofinfrastruktur
\nolig{finfus}{f|infus}
  % Tropfinfusion
\nolig{fingenieur}{f|ingenieur}
  % Prüfingenieur Kaufingenieur
\nolig{finhab}{f|inhab}
  % Hofinhaber
\nolig{finhalat}{f|inhalat}
  % Kamilledampfinhalationen
\nolig{finhalt}{f|inhalt}
  % Begriffinhalte Kropfinhalt
  \keeplig{Delfinhalt} % Delfinhaltung
  \keeplig{raffinhalt} % Paraffinhaltige
\nolig{finitia}{f|initia}
  % Korallenriffinitiative
\nolig{finjekt}{f|injekt}
  % Dampfinjektionsverfahren
\nolig{finkont}{f|inkont}
  % Ueberlaufinkontinenz
  \keeplig{Delfinkont} % Delfinkontakt

\nolig{finnenaus}{f|innenaus}
  % Schiffinnenausbau
\nolig{finnenohr}{f|innenohr}
  % Schafinnenohr
\nolig{finnenfl}{f|innenfl}
  % Hofinnenflächen
\nolig{finnenl}{f|innenfl}
  % Hofinnenleben
\nolig{finnenraum}{f|innenraum}
  % Kopfinnenraum
\nolig{finnenräum}{f|innenräum}
  % Schlafinnenräumen
\nolig{finnens}{f|innens}
  % Rumpfinnenseite

\nolig{finner}{f|inner}
  % tiefinnerlich Kopfinneres
```

```
\nolig{finnig}{f|innig}
  % tiefinnige
\nolig{finnov}{f|innov}
  % Tarifinnovationen
\nolig{finsass}{f|insass}
  % Raumschiffinsassen
\nolig{finsekt}{f|insekt}
  % Laufinsekt
\nolig{finsel}{f|insel}
  % Schafinsel Schilfinsel Saufinsel
\nolig{finserat}{f|inserat}
  % Titelkopfinserat
\nolig{finsign}{f|insign}
  % Knopfinsignien
\nolig{finspek}{f|inspek}
  % Kirchhofinspektor
\nolig{finsta}{f|insta}
  % Kunstriffinstallateur
  % Schiffinstandsetzung
  % Strafinstanz rumpfinstabil
\nolig{finstinkt}{f|instinkt}
  % Zupfinstinkt
\nolig{finstitu}{f|institu}
  % Strafinstitutionen
\nolig{finstrum}{f|instrum}
  % Zupfinstrumente Schleif- Greif-
\nolig{finsuff}{f|insuff}
  % Kreislaufinsuffizienz
\nolig{finszen}{f|inszen}
  % Kopfinszenierung
\nolig{fintars}{f|intars}
  % Griffintarsien
\nolig{fintell}{f|intell}
  % Hofintellektueller
\nolig{fintegr}{f|integr}
  % Tarifintegration
\nolig{fintens}{f|intens}
  % eingriffintensiv
\nolig{finter}{f|inter}
  % Feuerschiffinteressierte
  % Begriffinterpretationen
  % Strafinterventionen Rufintervalle
\nolig{finton}{f|inton}
  % Tiefintonieren
\nolig{fintrig}{f|intrig}
  % Briefintrige Hofintrige
\nolig{finvent}{f|invent}
  % Laufinventar
\nolig{finvest}{f|invest}
  % Anlaufinvestitition

\nolig{firis}{f|iris}
  % Sumpfiris
\nolig{fironi}{f|ironi}
  % tiefironisch
\nolig{firre}{f|irre}
  % Dorfirre
\nolig{firru}{f|irru}
  % Werfirrung

\nolig{fisolat}{f|isolat}
  % Strafisolator Schaumstoffisolation
\nolig{fisolie}{f|isolie}
  % Griffisolierung

\nolig{uffax}{uf|fax}
  % Notruffax Abruffax



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

\nolig{Aufl}{Auf|l}
\nolig{aufl}{auf|l}
  % Hundreds (thousands?!) of words ...
```

```
  % Mustn't do \nolig{Aufl}{Auf|l} b/c
  % of "Aufl." (abbrev. *with* ligature!)
  \keeplig{auflair} % Tierschauflair
  \keeplig{aufläche}% Schaufläche Grau- Stau-
                    % Anbau- Kau- Niveau- Plateau-
  \keeplig{aufliegl}% Taufliegelein
  \keeplig{auflüssig} % Tauflüssigkeit
  \keeplig{baufl} % Modellbauflieger Weinbauflecken
  \keeplig{Baufl} % Bauflaute
  \keeplig{blaufl}% blaufleckig blauflauschig
  \keeplig{Blaufl}% Blauflügel (Libelle)
  \keeplig{fraufl}% Frauflüge
  \keeplig{Fraufl}
  \keeplig{graufl}% Graufleckentest
  \keeplig{Graufl}
  \keeplig{onauflo}   % Donauflotte
  \keeplig{onauflu}   % Donauflut Donaufluss
  \keeplig{Moskaufl}  % Moskauflug
  \keeplig{Schauflieg}% Schaufliegen
  \keeplig{Schaufloß} % Schaufloßfahrten
  \keeplig{schauflöß}
  \keeplig{Schauflug}
  \keeplig{Schauflüg} % Schauflüge
  \keeplig{schauflieg}
  \keeplig{schaufloß}
  \keeplig{schauflöß} % Wahrschauflöße
  \keeplig{schauflug}
  \keeplig{schauflüg}


\nolig{Briefl}{Brief|l}
\nolig{briefl}{brief|l}
  % lots and lots of words ...
\nolig{Chefl}{Chef|l}
\nolig{chefl}{chef|l}
  % Cheflieferant -limousine -lobbyist -los
  \keeplig{achefl} % Rachefluch Einspracheflut
  \keeplig{ichefl} % Speichefluss
  \keeplig{schefl} % Ascheflocken Tuschefleck
  \keeplig{chefläche} % Bracheflächen ...

  \nolig{Dorfl}{Dorf|l}
  \nolig{dorfl}{dorf|l}
  % Dorfladen Dorflage Dorfleitplan
  \keeplig{dorfliese} % Korridorfliesen
  \keeplig{dorflüg}   % Condorflüge
  \nolig{Fünfl}{Fünf|l}
  \nolig{fünfl}{fünf|l}
  % fünflitrig Fünflochdüsen
  \nolig{Golfl}{Golf|l}
  \nolig{golfl}{golf|l}
  % viele Faelle
  \nolig{Hanfl}{Hanf|l}
  \nolig{hanfl}{hanf|l}
  % Hanfladen Hanfland Hanflegalisierung
  \nolig{Hofl}{Hof|l}
  \nolig{hofl}{hof|l}
  % Hoflaborant Hoflieferant
  \keeplig{hoflosk}  % Echofloskeln
  \nolig{Huflatt}{Huf|latt}
  \nolig{huflatt}{huf|latt}
  % Huflattich huflattichartig
  \nolig{Hufled}{Huf|led}
  \nolig{hufled}{huf|led}
  % Huflederhautentzundung
  \nolig{Impfl}{Impf|l}
  \nolig{impfl[ae]}{impf|l[ae]}
  % Impflegende Schimpflaute
  \keeplig{eimpflanz} % Keimpflanze
  \keeplig{impflege}  % Heimpfleger
  \nolig{Kopfl[äeioöuüy]}{Kopf|l}
  \nolig{kopfl[äeioöuüy]}{kopf|l}
  \nolig{Köpfl[aäioöuüy]}{Köpf|l}
  \nolig{köpfl[aäioöuüy]}{köpf|l}
  % Dutzende (Hunderte?) von Worten...
  % [kK]opfla -> caught by opfla rule
```

```
  % [kK]öpfle -> caught by öpfle rule
  \keeplig{kopflaster} % Ökopflaster
  \keeplig{kopfleg}    % Risikopflege
  \keeplig{kopflaum}   % Schokopflaumen
\nolig{Pfeifl}{Pfeif|l}
\nolig{pfeifl}{pfeif|l}
  % Pfeiflaute
\nolig{Prüfl}{Prüf|l}
\nolig{prüfl}{prüf|l}
  % Prüflabor Prüflast Prüflampe
\nolig{Schafl}{Schaf|l}
\nolig{schafl}{schaf|l}
  % Schafleder Schaflaus Schafleber
\nolig{Schiefl}{Schief|l}
\nolig{schiefl}{schief|l}
  % schieflachen Schieflage schieflaufen
\nolig{Schilfl}{Schilf|l}
\nolig{schilfl}{schilf|l}
  % Schilflabyrinth Schilflieder
\nolig{Schlafl}{Schlaf|l}
\nolig{schlafl}{schlaf|l}
  % lots and lots of words...
\nolig{Schleifl}{Schleif|l}
\nolig{schleifl}{schleif|l}
  % Schleiflack Schleiflade
\nolig{Senfl}{Senf|l}
  % Senfladen Senfliebhaber
\nolig{Steifl}{Steif|l}
\nolig{steifl}{steif|l}
  % steiflippig
\nolig{Strafl}{Straf|l}
\nolig{strafl}{straf|l}
  % lots and lots of words...
\nolig{Surfl}{Surf|l}
\nolig{surfl}{surf|l}
  % Surflizenz Surflegende
  \keeplig{surfleck}  % Lasurfleck
  \keeplig{surflüg}   % Klausurflügel
  \keeplig{surflüss}  % Glasurflüssigkeit
\nolig{Tarifl}{Tarif|l}
\nolig{tarifl}{tarif|l}
  % lots and lots of words...
\nolig{Stiefl}{Stief|l}
\nolig{Tiefl}{Tief|l}
\nolig{tiefl}{tief|l}
  % Tieflager stieflich

\nolig{Topfl}{Topf|l}
\nolig{topfl}{topf|l}
  % Topflappen Topflumpen
  \keeplig{Topflagg}   % Topflaggen
  \keeplig{rtopflicht} % portopflichtig
  \keeplig{topfläch}   % Biotopfläche
  \keeplig{topfleg}    % Autopflege
  \keeplig{topflop}    % Megatopflop
  \keeplig{topflug}    % Nonstopflug
  \keeplig{topflüg}    % Nonstopflüge

\nolig{Torfl}{Torf|l}
\nolig{torfl}{torf|l}
  % Torflieferant Torfloch
  \keeplig{Torflagge}
  \keeplig{Torflügel}
  \keeplig{Torflut}
  \keeplig{torfläche} % Rotorfläche
  \keeplig{torflasch} % Applikatorflasche
  \keeplig{torflieg}  % Motorfliegen
  \keeplig{torflimm}  % Monitorflimmern
  \keeplig{torflitz}  % Motorflitzer
  \keeplig{torfloss}  % Stabilisatorflossen
  \keeplig{torflott}  % Exploratorflotte
  \keeplig{torfluch}  % Auswärtstorfluch
  \keeplig{torflug}   % Simulatorflug
  \keeplig{torflüg}   % Motorflüge
  \keeplig{torflüss}  % Indikatorflüssigkeit
```

```
\nolig{Tropfl}{Tropf|l}
\nolig{tropfl}{tropf|l}
  % Tropfleckagen
  \keeplig{tropflug} % Elektropflug

\nolig{Wurfl}{Wurf|l}
\nolig{wurfl}{wurf|l}
  % Wurfluke Abwurfluke Einwurfluke
\nolig{Würfl}{Würf|l}
\nolig{würfl}{würf|l}
  % Würflung würfle

\nolig{aflied}{af|lied}
  % Schlaflied
\nolig{aflos}{af|los}
  % straflos schlaflos
  \keeplig{aflosk} % Propagandafloskel
  \keeplig{rafloss} % lyraflossig
\nolig{aflück}{af|lück}
  % Straflücke
\nolig{ampfl[aäou]}{ampf|l}
  % Dampflokomotive
  % Kampflärm Kampfluftschiff
  \keeplig{ampfläch} % Campfläche
  \keeplig{ampflanz} % Balsampflanzungen
  \keeplig{ampfleg}  % Teampflege
\nolig{arflad}{arf|lad}
  % Zeichenbedarfladen
\nolig{arfläd}{arf|läd}
  % Schulbedarfläden
\nolig{äufle}{äuf|le}
  % Häuflein träufle

\nolig{eufle}{euf|le}
  % verteufle
  \keeplig{eufleiß}  % treufleißig
  \keeplig{eufleiss} % treufleissig

\nolig{flabor}{f|labor}
  % Edelsteinprüflabor
\nolig{flage}{f|lage}
  % Rohstofflager Straflager Auflage
  \keeplig{siflage} % Persiflage
  \keeplig{ouflage} % Camouflage
\nolig{flagun}{f|lagun}
  % Rifflagune
\nolig{flähm}{f|lähm}
  % Kehlkopflähmung
\nolig{flamp}{f|lamp}
  % Kompaktleuchtstofflampe Notruflampe
\nolig{fland}{f|land}
  % Hofland Kaufland Sumpfland Tiefland
  % Straflandesgericht Dorflandwirtschaft
  % Iffland Rifflandschaft
  \keeplig{flandern}  % Ostflandern
  \keeplig{flandrisch}
\nolig{fländ}{f|länd}
  % hofländlich Sumpfländer Tiefländer
\nolig{fläng}{f|läng}
  % Straflänge Rumpflänge Lauflänge
\nolig{flapp}{f|lapp}
  % Seiflappen Topflappen
\nolig{flärm}{f|lärm}
  % Auspufflärm
\nolig{fflatter}{f|flatter}
  % Vorhofflattern aufflattert
\nolig{flauf}{f|lauf}
  % schieflaufen Auflauf Brieflauf
\nolig{fläuf}{f|läuf}
  % schiefläuft Hofläufer Strafläufe
  % Prüfläufe Aufläufe Tiefläufer
\nolig{flaun}{f|laun}
  % Kauflaune Wurflaune Kampflaune

\nolig{fleb}{f|leb}
```

```
  % Hofleben Kopfleben Druckkopflebensdauer
  \keeplig{huffleb} % shuffleboard
\nolig{flehn}{f|lehn}
  % steiflehnig
\nolig{flehr}{f|lehr}
  % Dorflehrer Eislauflehrerin
\nolig{fleiden}{f|leiden}
  % Kropfleidende
\nolig{flein}{f|lein}
  % Laufleine Scherflein Wölflein
  % Köpflein Zöpflein
\nolig{fleist}{f|leist}
  % Dampfleistung Knopfleiste
  % Kopfleiste Auswurfleistung
  % Griffleiste Stoffleiste
  % Abstreifleiste
\nolig{fleit}{f|leit}
  % Dampfleitung Hofleitung Baufhofleiter
  % Kaufleitung Notrufleitung aufleiten
  % inbegriffleitend Kraftstoffleitung
  \keeplig{Kaltefleiter} % a surname...
\nolig{flektür}{f|lektür}
  % Schenkelklopflektüre
\nolig{fler}{f|ler}
  % Freiberufler Löffler Büffler Schnüffler
\nolig{fleut}{f|leut}
  % Hofleute

\nolig{flich}{f|lich}
  % tariflich reiflich unbegreiflich
  % glimpflich schimpflich behilflich
  % brieflich verwerflich sträflich
  % gräflich markgräflich beruflich
  % käuflich unverkäuflich höflich
  % bischöflich unerschöpflich dörflich
  % vortrefflich begrifflich
  %% Vorsicht mit Pflicht und (p)flicht,
  %% sowie mit einflicht, verflicht, etc.:
  \keeplig{flicht}
    %% Noch mehr Vorsicht mit Sumpflicht:
    \nolig{Sumpflicht}{Sumpf|licht}
    \nolig{sumpflicht}{sumpf|licht}
    \nolig{öpflicht}{öpf|licht} % kröpflicht (?)
      %% Aber: Visumpflicht Konsum- Impressum-
      \keeplig{isumpflicht}
      \keeplig{nsumpflicht}
      \keeplig{ssumpflicht}

\nolig{flieb}{f|lieb}
  % freiberufliebend riffliebend
\nolig{flig}{f|lig}
  % schweflig würflig knifflig mufflig
  % zweigipflig fünfzipflig
\nolig{flief}{f|lief}
  % schieflief Hoflieferant
\nolig{flinde}{f|linde}
  % Dorflinde Wolflinde Ziegelhoflinde
  % krampflindernd
\nolig{fling}{f|ling}
  % Prüfling Fünfling Sträfling Täufling
\nolig{flini}{f|lini}
  % Wurflinie Straflinie Rumpflinie
\nolig{flinse}{f|linse}
  % Fünflinser Wegwerflinsen
\nolig{flisch}{f|lisch}
  % teuflisch Tüpflischeißer
\nolig{flist}{f|list}
  % Prüfliste Rufliste Kaufliste
\nolig{fliter}{f|liter}
  % Hofliteratur Fünflitermotor
\nolig{flizenz}{f|lizenz}
  % Radfahrprüflizenz

\nolig{flobby}{f|lobby}
  % Maulwurflobbyisten
\nolig{flöch}{f|löch}
```

```
  % Sturmwurflöcher Knopflöcher
  % Sufflöcher Grifflöcher
  \keeplig{flöchte}
\nolig{flöff}{f|löff}
  % Tieflöffelbagger auflöffeln
  % Schöpflöffel
\nolig{flohn}{f|lohn}
  % Tariflohn Tieflohnland
  \keeplig{flohnetz} % Wasserflohnetz
\nolig{flöhn}{f|löhn}
  % Tariflöhne
\nolig{flok}{f|lok}
  % Dampflokomotive
\nolig{flord}{f|lord}
  % Wolflord
\nolig{flösch}{f|lösch}
  % Hoflöschmaschine
\nolig{flösu}{f|lösu}
  % Schmierseiflösung

\nolig{fluft}{f|luft}
  % Auspuffluft
\nolig{flung}{f|lung}
  % Verzweiflungsakt Verteuflung Stafflung
\nolig{flust}{f|lust}
  % Kampflust Impflust kauflustig Rauflust



\nolig{gipfle}{gipf|le}
  % gipfle
\nolig{ipflig}{ipf|lig}
  % zweigipflig fünfzipflig

\nolig{chopfl}{chopf|l}
  % Schopflilie Schopflavendel

\nolig{lflady}{lf|lady}
  % Goldlady

\nolig{lfland}{lf|land}
  % Altelfland Delfland
\nolig{lflast}{lf|last}
  % Wolflast

\nolig{lflos}{lf|los}
  % hilflos
  \keeplig{lfloss}
  % Walflosse Kielflosse Paddelflossen
  \keeplig{lflosk}
  % Moralfloskel Sozialfloskeln Spielfloskel

\nolig{oflad}{of|lad}
  % Biohofladen
\nolig{ofläd}{of|läd}
  % Biohofläden
\nolig{oflück}{of|lück}
  % Vorhoflücke

\nolig{opfla}{opf|la}
  % Topflappen Kopflaus kopflastig
  \keeplig{opflagg}
  \keeplig{opflair}  % Popflair
  \keeplig{opflanz}  % Topflanzen
  \keeplig{opflaum}  % Mangopflaumen


  % Kakaopflanzen Indigopflanzen
  \keeplig{opflaster}
  % Kinopflaster
\nolig{öpfle}{öpf|le}
  % köpfle tröpfle Knöpfle
\nolig{orflad}{orf|lad}
  % Dorfladen

\nolig{pflaut}{pf|laut}
  % Kehlkopflaut
\nolig{pfleier}{pf|leier}
```

```
  % Zupfleier
\nolig{pfleis}{pf|leis}
  % Knopfleise
\nolig{pfleu}{pf|leu}
  % Natriumdampfleuchten Kopfleuchte
\nolig{pflid}{pf|lid}
  % Schlupflid
\nolig{pflied}{pf|lied}
  % Kampflied
\nolig{pfloch}{pf|loch}
  % Knopfloch
\nolig{pflöch}{pf|löch}
  % Knopflöcher
\nolig{pflos}{pf|los}
  % kampflos kopflos
  \keeplig{pfloss}  % Pappflossen
\nolig{pflös}{pf|lös}
  % krampflösend Hüftkopflösung
\nolig{pflöwe}{pf|löwe}
  % Goldkopflöwenäffchen
  % Schwarzkopflöwenäffchen
\nolig{pflup}{pf|lup}
  % Kopflupe
\nolig{pflux}{pf|lux}
  % Hüftkopfluxation

\nolig{rfläd}{rf|läd}
  % Dorfläden Surfläden
\nolig{rflück}{rf|lück}
  % Sturmwurflücken
\nolig{rfluke}{rf|luke}
  % Abwurfluke Einwurfluke

\nolig{reifl}{reif|l}
  % Greiflippe Stegreiflieder Streiflacher
  \keeplig{Breifl}
  \keeplig{breifl}
  \keeplig{Dreifl}
  \keeplig{dreifl}
  \keeplig{Freifl}
  \keeplig{freifl}
  \keeplig{reifläch} % Freiflächen
  \keeplig{reiflagg} % Reedereiflagge
  \keeplig{reiflamm} % dreiflammig
  \keeplig{reiflasch}% Milchbreiflaschen
  \keeplig{reiflock} % Breiflocken
  \keeplig{reifloh}  % Büchereiflohmarkt
  \keeplig{reiflöhe} % Gießereiflöhe
  \keeplig{reiflott} % Fischereiflotte
  \keeplig{reiflüge} % Dreiflügelaltar
  \keeplig{reiflügl} % dreiflüglig

\nolig{Ruflaut}{Ruf|laut}
\nolig{ruflaut}{ruf|laut}
  % Ruflaute ruflautstark
\nolig{Ruflos}{Ruf|los}
\nolig{ruflos}{ruf|los}
  % ruflos beruflos

\nolig{tafle}{taf|le}
  % tafle
  \keeplig{tafleck}  % Zahnpastaflecken
  \keeplig{taflege}  % Regattaflegel

\nolig{urflad}{urf|lad}
  % Surfladen
\nolig{urfloch}{urf|loch}
  % Balleinwurfloch

\nolig{wafle}{waf|le}
  % schwafle
\nolig{wefle}{wef|le}
  % schwefle
\nolig{weifle}{weif|le}
  % bezweifle verzweifle
  \keeplig{weifleck}   % zweifleckig
```

```
\nolig{werfl}{werf|l}
  % Wegwerflied
  \keeplig{chwerfl}
  % Schwerflugzeug schwerfließend
  \keeplig{werflitz} % Powerflitzer



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

\nolig{affind}{af|find}
  % Straffindung
  \keeplig{araffind} % Paraffinduft

\nolig{ffibel}{f|fibel}
  % Zwiebelknopffibeln
\nolig{ffieb}{f|fieb}
  % Sumpffieber Wahlkampffieber
\nolig{ffigu}{f|figu}
  % Streiffigur
\nolig{ffilm}{f|film}
  % Werwolffilm
\nolig{ffilter}{f|filter}
  % Tropffilter Topffilter
\nolig{ffinal}{f|final}
  % Hammerwurffinale
\nolig{ffinte}{f|finte}
  % Sprungwurffinte
\nolig{ffinanz}{f|finanz}
  % Hoffinanz Kauffinanzierung
\nolig{ffistel}{f|fistel}
  % Kropffistel
\nolig{ffixier}{f|fixier}
  % Dampffixiergerät

\nolig{hoffing}{hof|fing}
  % Bischoffinger

\nolig{iffind}{if|find}
  % Tariffindung

\nolig{lffing}{lf|fing}
  % Zwölffingerdarm
\nolig{lffisch}{lf|fisch}
  % Wolffisch

\nolig{mpffisch}{mpf|fisch}
  % Kampffisch

\nolig{nffing}{nf|fing}
  % fünffingrig Fünffingergebirge

\nolig{pffi}{pf|fi}
  % topffit Kopffilm Wahlkampffinanzierung
  % Schlangenkopffisch

\nolig{reiffing}{reif|fing}
  % Greiffinger
\nolig{rffinte}{rf|finte}
  % Sprungwurffinte



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

\nolig{Stoffi}{Stoff|i}
\nolig{stoffi}{stoff|i}
  % Rohstoffindustrieller Rohstoffimporte
  % Baustoffingenieur Kunststoffingenieur
  % Kohlenstoffisotope
  \keeplig{stoffiz}
  % Geheimdienstoffiziere
  \keeplig{stoffig}
```

```
  % permit ffi ligature for -ig suffix...

\nolig{ffidee}{ff|idee}
  % Luftschiffidee
\nolig{ffinnen}{ff|innen}
  % Schiffinnenraum Schiffinnenausbau


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

\nolig{Griffl}{Griff|l}
\nolig{griffl}{griff|l}
  % Grifflängen Grifflaschen Griffleiste
  % grifflos angrifflustig
\nolig{Hofflü}{Hof|flü}
\nolig{hofflü}{hof|flü}
  % Hofflügel
\nolig{Offline}{Off|line}
\nolig{offline}{off|line}
  % offline, Offline
\nolig{Pfiffl}{Pfiff|l}
  % Pfifflaute
\nolig{Scheffle}{Scheff|le}
\nolig{scheffle}{scheff|le}
  % scheffle Geldscheffler
\nolig{Schiffl}{Schiff|l}
\nolig{schiffl}{schiff|l}
  % Schifflache Schiffladung Schifflinie
\nolig{Stoffl}{Stoff|l}
\nolig{stoffl}{stoff|l}
  % lots of words...
\nolig{Treffl}{Treff|l}
\nolig{treffl}{treff|l}
  % Trefflokal

\nolig{afflu}{aff|lu}
  % Gafflust
\nolig{fflack}{ff|lack}
  % Auspufflack
\nolig{fflamell}{ff|lamell}
  % Rafflamellen
\nolig{ffland}{ff|land}
  % Iffland Rifflandschaft
\nolig{fflast}{ff|last}
  % Rohstofflastigkeit Treibstofflaster
\nolig{fflatsch}{ff|latsch}
  % Rifflatschern
\nolig{fflieb}{ff|lieb}
  % riffliebend
\nolig{ffloch}{ff|loch}
  % Suffloch Griffloch Sauerstoffloch
\nolig{fflöch}{ff|löch}
  % Sufflöcher Grifflöcher
\nolig{fflos}{ff|los}
  % auspufflos
\nolig{fflung}{ff|lung}
  % Stafflung

\nolig{ifflo}{iff|lo}
  % Schifflogbuch grifflos Griffloch

\nolig{offlad}{off|lad}
  % Sprengstoffladung
\nolig{öffle}{öff|le}
  % löffle
%%%\nolig{offleck}{off|leck}
%%%  % Treibstoffleck
%%%\nolig{offlief}{off|lief}
%%%  % Brennstofflieferungen
\nolig{offlo}{off|lo}
  % wirkstofflos Sauerstoffloch
  % offload

\nolig{taffle}{taff|le}
```

```
  % staffle

\nolig{ufflad}{uff|lad}
  % Suffladen
\nolig{uffläd}{uff|läd}
  % Suffläden
\nolig{luffleck}{luff|leck}
  % Bluffleck
\nolig{üffle}{üff|le}
  % schnüffle büffle trüffle
\nolig{ufflon}{uff|lon}
  % Mufflon



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

\nolig{ffläch}{f|fläch}
  % Lauffläche Kampfflächen
  % Zwölfflächner (dodecahedron)
%%\nolig{fflatt}{f|flatt}
%%  % aufflattern
\nolig{fflech}{f|flech}
  % aufflechten
\nolig{ffleisch}{f|fleisch}
  % Schaffleisch Kopffleisch
\nolig{fflexib}{f|flexib}
  % Tarifflexibilitat
\nolig{fflies}{f|flies}
  % Reliefflliesen
\nolig{fflimm}{f|flimm}
  % Vorhofflimmern
\nolig{ffluch}{f|fluch}
  % Tarifflucht Werwolffluch
\nolig{fflüch}{f|flüch}
  % Tarifflüchtling
\nolig{fflug}{f|flug}
  % Tiefflug Kampfflugzeug Chefflugleiter
\nolig{fflur}{f|flur}
    % Klosterhofflur
\nolig{ffluss}{f|flus}
    % Prüffluss
\nolig{fflüs}{f|flüs}
  % Schleifflüsigkeit}
\nolig{fflut}{f|flut}
  % Briefflluten

\nolig{iefflieg}{ief|flieg}
  % tiefflliegend
\nolig{iefflog}{ief|flog}
  % tiefflog
\nolig{iefflüg}{ief|flüg}
  % Tiefflüge


%%%% XXXXXXXXXX

\nolig{eiffleck}{eif|fleck}
  % Schleiffflecklein

\nolig{fflüg}{f|flüg}
  % Streifflüge zwölfflügelig
\nolig{fflut}{f|flut}
  % Briefflluten Rückrufflut Anrufflut

\nolig{lfflach}{lf|flach}
  % Zwölfflach
\nolig{lffläch}{lf|fläch}
  % Zwölfflächner zwölfflächig

\nolig{pffl}{pf|fl}
  % Sumpffläche Sturzkampfflieger
  % Totenkopfflagge Impfflüssigkeit
  \keeplig{Knoepffl}  % Knoepffler
```

```
\nolig{rfflad}{rf|flad}
  % Torffladen
\nolig{rfflasch}{rf|flasch}
  % Wegwerfflasche

\nolig{ufflot}{uff|lot}
  % Sufflot

\nolig{wurfl}{wurf|l}
  % Freiwurflinie Maulwurflobbyist Abwurflast




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

%%%\nolig{ftig}{f|tig}
%%%  % dürftig bedürftig
%%%\nolig{ftung}{f|tung}
%%%  % Haftung Stiftung

\nolig{Auft}{Auf|t}
\nolig{auft[aähioöruüy]}{auf|t}
  % (viele viele Fälle)
%%%\nolig{aufte}{auf|te}
%%%  % kaufte kauftest raufte

\nolig{Brieft}{Brief|t}
\nolig{brieft}{brief|t}
  % Brieftasche Brieftaube
\nolig{Cheft}{Chef|t}
\nolig{cheft[a-z]}{chef|t}
  % Cheftheoretiker Cheftrainer
\nolig{Dorft}{Dorf|t}
\nolig{dorft}{dorf|t}
  % Dorftrottel -tratsch -tümpel
\nolig{Fünft[a-zäöü]}{Fünf|t}  % Fünftagewoche ...
\nolig{fünft[a-zäöü]}{fünf|t}  % fünfens...

\nolig{Golft}{Golf|t}
  % Golfträume -turnier -typ -talent
\nolig{golft[hiruüy]}{golf|t}
  % golfta -> caught by lfta rule
  % golfto -> caught be lfto rule
  % golftä -> caught by lftä rule
  % golftö -> caught be lftö rule

\nolig{Hanft}{Hanf|t}
  % Hanftaler Hanftau
\nolig{Hoft}{Hof|t}
\nolig{hoft[aähioöruü]}{hof|t}
  % Hoftor Klosterhoftor
  % hofte -> caught by fte rule
\nolig{Prüft}{Prüf|t}
  % Prüftechnik Prüfteam
\nolig{prüft[aähioöruü]}{prüf|t}
  % Prüftheorie
%%%\nolig{prüfte}{prüf|te}

%%%\nolig{Schaft}{Schaf|t}
%%%\nolig{schaft[aäehioörüy]}{schaf|t}
  % -tor -tal -
\nolig{Schlaft}{Schlaf|t}
\nolig{schlaft[aähioöruüy]}{schlaf|t}
  % Schlaftablette
\nolig{Schilft}{Schilf|t}
\nolig{schilft[hiruüy]}{schilf|t}
  % Schilfteich Schlilftümpel
  % schilftä -> caught by lftä rule
  % schilfte -> caught by lfte rule
  % schilfto -> caught by lfto rule
  % schilftö -> caught by lftö rule
\nolig{Senft}{Senf|t}
  % Senftube
\nolig{Straft}{Straf|t}
\nolig{straft[aähioöruüy]}{straf|t}
```

```
  % (viele Fälle)
  \keeplig{straftheit} % Unbestraftheit
  % strafte -> caught be fte rule
\nolig{Surft}{Surf|t}
  % Surfthema Surftipp
\nolig{Tarift}{Tarif|t}
\nolig{tarift}{tarif|t}
  % Tarifthemen Tariftabelle
\nolig{Tieft}{Tief|t}
  % Tieftänzer -träumen -tresor -tunnel
\nolig{Torft}{Torf|t}
\nolig{torft}{torf|t}
  % Torftabletten Torftaucher Torftoilette
\nolig{Wurft}{Wurf|t}
\nolig{wurft}{wurf|t}
  % Wurftalent Wurftaler



%%%\nolig{fte}{f|te}
%%%  % schleifte reifte seifte prüfte überprüfte
%%%  % schaffte hoffte klaffte verpuffte
%%%  % vertiefte verbriefte Brieftext
%%%  % elfte elftens zwölfte
%%%  % Fünfte fünfter
%%%  % kämpfte schimpfte schrumpfte schöpften
%%%  % durfte bedurfte surfte dürfte schlürfte
%%%  % schärfte verschärfte
%%%  % abgestufte getaufte häufte unbedarfte
%%%  % Schilfteich Dorfteich
%%%  \keeplig{Delfte}
%%%  \keeplig{Dufte}
%%%  \keeplig{Hafte}   % Haftentlassung
%%%  \keeplig{Krafte}  % Kraftersatz
%%%  \keeplig{krafte}
%%%  \keeplig{Lufte}   % Lufteinlass
%%%  \keeplig{lufte}   % Freilufteislauffläche
%%%  \keeplig{Lüfte}   % Lüftend
%%%  \keeplig{lüfte}   % lüften
%%%  \keeplig{älfte}   % Hälfte %%%%
%%%  \keeplig{schafte} % many words...
%%%  \keeplig{Hüftex} % Hüftexartikuliert
%%%  \keeplig{hüftex}
%%%  \keeplig{ftempf}  % duftempfindlich
%%%  \keeplig{ftentl}  % haftentlassen
%%%  \keeplig{ftepoch}
%%%  \keeplig{ftersuch}% Unterkunftersuchung

\nolig{Elfte}{Elf|te}
\nolig{elfte}{elf|te}
  % elfte elftens
\nolig{ölfte}{ölf|te}
  % zwölfte zwölftens

\nolig{fft[aähioöruüy]}{ff|t}
  % Stofftasche Sauerstofftank Stofftheorie
  % Stofftier Stofftiger Stofftischtuch
  % Auspufftopf Kunststofftonne
  % Stofftradition Stofftrennung
  % Kunststofftube Stoffturnschuhe
  % Stofftäschchen
  % Auspufftöpfe Kunststofftöpfe
  % Kunststofftüten

%%%  %% ffte -> caught by fte rule
%%%  \keeplig{fftheit} % Bekifftheit



\nolig{aftee}{af|tee}
  % Schlaftee

\nolig{eiftie}{eif|tie}
  % Greiftiefe Steiftier
\nolig{eiftit}{eif|tit}
  % Eingreiftitel
\nolig{eiftr}{eif|tr}
```

```
  % Eingreiftruppe Nadelstreifträger

\nolig{ftabell}{f|tabell}
  % Ruftabelle
\nolig{ftafel}{f|tafel}
  % Pfeiftafel
\nolig{ftag}{f|tag}
  % Tauftag Fünftagewoche
\nolig{ftalsg}{f|talsg}
  % schaftalsgrundig
\nolig{ftanz}{f|tanz}
  % Kampftanz Schilftanz
\nolig{ftänz}{f|tänz}
  % Tieftänzer
\nolig{ftari}{f|tari}
  % Anruftarif
\nolig{ftarn}{f|tarn}
  % Wegwerftarnungen
\nolig{ftasse}{f|tasse}
  % Schürftasse
  \keeplig{ftassel} % Gruftasseln
\nolig{ftatb}{f|tatb}
  % Straftatbestände
\nolig{ftaten}{f|taten}
  % Kampftat Straftaten
\nolig{ftätig}{f|tätig}
  % Schürftätigkeit
\nolig{ftauch}{f|tauch}
  % Beruftaucher Kreislauftauchgerät
\nolig{ftaugl}{f|taugl}
  % pruftauglich
\nolig{ftaume}{f|taume}
  % Nachruftaumel
\nolig{ftax}{f|tax}
  % Ruftaxi

\nolig{ftedd}{f|tedd}
  % Schlafteddy
\nolig{ftemp}{f|temp}
  % Schlaftemperatur
\nolig{fteich}{f|teich}
  % Schilfteich Dorfteich

\nolig{ftheat}{f|theat}
  % Stegreiftheater
\nolig{fthem}{f|them}
  % Wolfthema
\nolig{ftheor}{f|theor}
  % -f-theorie -f-theorien
\nolig{ftherap}{f|therap}
  % Impftherapie Schröpftherapeut
\nolig{ftick}{f|tick}
  % Rückruftickets Diskuswurfticket
\nolig{ftier}{f|tier}
  % Wegwerftier Huftier inhaftiert
\nolig{ftipp}{f|tipp}
  % Surftipp
\nolig{ftirad}{f|tirad}
  % Schimpftirade
\nolig{ftisch}{f|tisch}
  % Schleiftisch

\nolig{ftod}{f|tod}
  % Hanftod
\nolig{fton}{f|ton}
  % Pfeifton Zwölftonmusik Rufton
\nolig{ftön}{f|tön}
  % Pfeiftöne Ruftöne
\nolig{ftool}{f|tool}
  % Prüftool
\nolig{ftopf}{f|topf}
  % Schleiftopf Dampf- Auspuff- Schöpf-
  \keeplig{ftopfer} % Duftopfer Gift- Haft-
\nolig{ftorig}{f|torig}
  % schaftorig fünftorig
\nolig{ftour}{f|tour}
```

```
  % Streiftour

\nolig{ftrad}{f|trad}
  % Ruftraditionen
\nolig{ftrag}{f|trag}
  % tieftragisch auftragsgerecht
\nolig{fträg}{f|träg}
  % Notrufträger
\nolig{ftrain}{f|train}
  % Lauftrainer
\nolig{ftränk}{f|tränk}
  % Rückkruftränke
\nolig{ftransp}{f|transp}
  % Hilftransport Schaftransport
\nolig{fträum}{f|träum}
  % tiefträumend
\nolig{ftrauri}{f|traurig}
  % tieftraurig
\nolig{ftreff}{f|treff}
  % Notruftreffen
\nolig{ftresor}{f|tresor}
  % Tieftresor
\nolig{ftrick}{f|trick}
  % Rückkruftricks
\nolig{ftrieb}{f|trieb}
  % auftriebte schaftriebig
\nolig{ftrief}{f|trief}
  % tieftriefend
\nolig{ftrift}{f|trift}
  % schaftriftig
\nolig{ftritt}{f|tritt}
  % Huftritte
\nolig{ftret}{f|tret}
  % Mieftreter
\nolig{ftrott}{f|trott}
  % Stuftrottel

\nolig{ftrüb}{f|trüb}
  % tieftrübe
\nolig{ftrunk}{f|trunk}
  % schlaftrunken
\nolig{ftrupp}{f|trupp}
  % Prüftruppe

\nolig{ftuch}{f|tuch}
  % Schnieftuch Kopftuch
\nolig{ftüch}{f|tüch}
  % Schnieftücher
\nolig{ftürk}{f|türk}
  % tieftürkis
\nolig{fturm}{f|turm}
  % Wolfturm
\nolig{ftürm}{f|türm}
  % Wolftürme

\nolig{ftyp}{f|typ}
  % Schifftyp Stofftyp waldorftypisch
\nolig{ftyr}{f|tyr}
  % Dorftyrann Hoftyrann
\nolig{ftwist}{f|twist}
  % Kopftwister


\nolig{iefta}{ief|ta}
  % Tieftaucher Brieftasche Brieftaube
\nolig{iefto}{ief|to}
  % Stieftochter Tiefton
\nolig{ieftö}{ief|tö}
  % Stieftöchter tieftönend
\nolig{ieftra}{ief|tra}
  % Tieftraumphase

\nolig{lfta}{lf|ta}
  % elftausend zwölftausend Golftasche
\nolig{lftä}{lf|tä}
  % elftägig zwölftägig
```

```
\nolig{lfto}{lf|to}
  % Zwölftonmusik Elftonner Golftour
\nolig{lftö}{lf|tö}
  % zwölftönend
\nolig{elieft}{elief|t}
  % Relieftäfelchen Relieftropfen Relieftürme

\nolig{nftause}{nf|tause}
  % fünftausend Fünftausender
\nolig{nftä}{nf|tä}
  % fünftägig

\nolig{nftopf}{nf|topf}
  % Senftopf
\nolig{nftöpf}{nf|töpf}
  % Senftöpfchen
\nolig{nftor}{nf|tor}
  % fünftorig
  \keeplig{unftor}
  % Zukunftorientiert Herkunftort
  % Zunftort Zunftordnung
\nolig{nftr}{nf|tr}
  % fünftrimestrig
  \keeplig{Brunftr} % Brunftrudel -revier

\nolig{nftü}{nf|tü}
  % fünftürig Senftüte
  \keeplig{nftüb}
  % Vernunftüberlegung Zunftüberlieferung
    \nolig{nftübchen}{nf|tübchen} % Senftübchen

\nolig{pft[aähioöruüy]}{pf|t}
  % Wettkampftag Kampftaktik Kampftruppe
  % Kampftätigkeit Kampftänzer
  % wahlkampftauglich Wahlkampftöne
  % Schnupftabak Schnupftuch Schnupftücher
  % Schimpftiraden Mehrkampftitel Stapftiefe
  % Dampftopf Sumpftour Wettkampftrubel
  % Kopftreffer Kopftuch
  % Kopftücher Kopftüchlein
  % Herzklopftöne Zopfträger
  \keeplig{pftheit}
  % Gedämpftheit Umkämpftheit

\nolig{raftum}{raf|tum}
  % Burggraftum
\nolig{raftüm}{raf|tüm}
  % Markgraftümer

\nolig{rftherap}{rf|therap}
  % Wurftherapie
\nolig{rftr}{rf|tr}
  % Wurftraining Surftrip Freiwurftreffer
  \keeplig{tdurftrö} % Notdurftröhre
\nolig{rftu}{rf|tu}
  % Wurftuch

\nolig{uftas}{uf|tas}
  % Ruftaste Vorlauftaste Kauftasche
  \keeplig{Duftas}  % Duftaspekte
  \keeplig{duftas}
  \keeplig{Gruftas}  % Gruftassel
  \keeplig{gruftas}
  \keeplig{Luftas}  % Luftasket
  \keeplig{luftas}
  \keeplig{uftassoz}
  % Duftassoziationen Schuftassoziationen
%%%\nolig{üftreib}{üf|treib}
%%%  % Beutelprüftreiben

\nolig{urfta}{urf|ta}
  % Wurftalent Auswurftaste Surftalent
  \keeplig{tdurfta} % Notdurftanlage
```

```
\nolig{urfto}{urf|to}
  % Freiwurftor Surftour


% 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 names of *non-German*
  % origin for which the 'fk' ligature
  % shouldn't be suppressed. Use \keeplig
  % macros to treat these cases.
  \keeplig{Kafka}
  \keeplig{kafka}
  \keeplig{Piefke}
  \keeplig{Safka}
  \keeplig{Potrafke}
  \keeplig{Sprafke}
  \keeplig{Shirafkan}
  \keeplig{Tirafkan}
  \keeplig{Selfkant}



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

% Suppress this ligature globally -- Words of
% German origin only seem to feature 'fj'
% across morpheme boundaries.

\nolig{fj}{f|j}
  % aufjauchzen aufjaulen fünfjährig Kampfjet
  % Strafjustizgebäude Dorfjugend Kopfjäger ...

  % Once more, though, there are some words of
  % *non-German* (e.g., Nordic and Slavic)
  % origin for which the 'fj' ligature should
  % not be suppressed. Use \keeplig macros to
  % treat such cases.
  \keeplig{fjord} % Norwegian
  \keeplig{fjör}  % Icelandic, e.g.,
                  % Isafjördur and Ísafjörður
  \keeplig{Ísafjarðarbær} % city in Iceland
  \keeplig{fjell} % Norwegian
  \keeplig{fjall} % Swedish (?)
  \keeplig{fjäll} % Swedish
  \keeplig{fjöll} % Swedish

  \keeplig{Prokofjew}
  \keeplig{Sufjan} % Stevens
  \keeplig{Eefje}  % Dutch first name
  \keeplig{Astafjew}
    % Author (Wiktor) and soccer player (Maksim)



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

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

  % This macro will also break up any 'fffl'
  % ligatures into 'ff' and 'fl' parts.
  % Examples: Sauerstoffflasche Stofffleck
  %           Schliffläche Kunststoffflügel
```

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

```
% !TEX TS-program = lualatex
% selnolig-bugreport.tex, 2013/01/16

\documentclass{article}
\usepackage[margin=1in]{geometry}
\usepackage{fontspec}
% Choose a different font if desired:
\setmainfont{EB Garamond 12 Regular}

% Comment out the next instruction if you don't use babel;
% and set the language version that meets your needs.
\usepackage[ngerman]{babel}

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

\begin{document}
\paragraph*{Version of selnolig package used:}
\selnoligpackageversion, \selnoligpackagedate % defined in selnolig.sty

\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}
```