The selnolig package:
Selective suppression of typographic ligatures[*]

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Abstract

The selnolig package provides a novel set of LaTeX macros that let users suppress typographic ligatures selectively for an entire document, i.e., based on pre-defined search patterns, rather than on a case-by-case basis. Building on these macros, the package further provides extensive sets of ligature suppression rules for both English and German language texts. The ligatures broken up by the package's rules are deemed inappropriate because they span morpheme boundaries within composite words. For example, the word shelfful, which is mentioned in the TEXbook as a word for which the ff ligature may be inappropriate, is automatically typeset as shelfful rather than as shelfful.

For both English and German language documents, the selnolig package provides rules for the selective suppression of so-called "common" or f-ligatures. These comprise the ff, fi, fl, ffi, and ffl ligatures as well as ft and fft. Other f-ligatures, such as fb, fh, fj and fk, are suppressed globally, while making exceptions for names and words of non-English/German origin, such as Kafka and Sognefjord.

For English language documents, the package further provides ligature suppression rules for a number of so-called "discretionary" or "rare" ligatures, such as ct, st, and sp.

The selnolig package requires use of the LuaLaTeX format provided by a recent TEX distribution such as TEXLive 2013 or MiKTEX 2.9.

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[*]Current version: 0.260. Features of the selnolig package are subject to change without prior notice.

The main text font used in this document is Garamond Premier Pro. EB Garamond is used for words that use the fb, fh, fj, fk, ffb, ffh, ffj, ffk, es, and sk ligatures. "Common", "discretionary", and "historic" typographic ligatures are enabled for these text fonts—*and* are suppressed selectively using the rules of the selnolig package.

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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 regularly cited 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 composite words for which certain typographic ligatures may not be appropriate. For instance, 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, rather than as "shelfful". 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.[1] For English language documents, though, the need to suppress typographic ligatures that span morpheme boundaries does not appear to be a hugely pressing typographic priority, possibly because English doesn't feature that many composite words than contain ligatures that span the boundaries of the underlying word particles or morphemes.[2] However, in other languages, and especially in German, composite words are much more common. In these languages, there is also a much greater potential for composite words to feature instances of `ff`, `fi`, `fl` etc. character pairs that span morpheme boundaries. In German typography, a ligature that spans a morpheme boundary appears to be something that should generally be avoided, presumably because the presence of such ligatures has the potential to impair seriously the readability and intelligibility of the composite words.

TeX and Friends offer several methods for suppressing ligatures on a case-by-case basis. In LaTeX, there are three basic methods for suppressing ligatures: (i) insertion of an "empty atom", `{}`, between the characters whose ligature should be suppressed; (ii) insertion of an explicit italic correction, `\/`; and (iii) insertion of an explicit "kern", e.g., `\kern0pt` or `\hspace{0pt}`.[3] The babel package, when used with the `ngerman` or `german` options, offers the "shortcut" macro `"|` to suppress ligatures. A drawback shared by all of these methods is that they must be applied separately to each and every word in the document that contains unwanted ligatures. As such, these case-by-case methods are both time-intensive and tedious. Moreover, there's always a residual risk that some words for which ligatures should be suppressed will be overlooked in the editing process.

There are also several preprocessor-type packages and scripts—I mention rmligs and Ligatures-German in Section 7 below, but others exist as well—that scan the input file(s) and insert marks (usually, but not necessarily, the babel `"|` shortcuts) in the places where ligatures should be avoided. While ingenious, these preprocessor-based solutions suffer from several drawbacks which, taken together, may help explain why they do not appear to be in widespread use despite their usefulness. First, they add complexity to the document preparation process. E.g., if the document is being edited inside an IDE or integrated development

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[1] Observe that all three of these words are composed of two meaning-bearing particles or *morphemes*: the first morpheme ends in an "f" or "ff" while the second morpheme starts 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; all words—other than nonsense words, I suppose—contain at least one morpheme. The words apple and orange contain one morpheme each, and the words apples, oranges, shelfful, cufflink, and offload each contain *two* morphemes.

[2] This conjecture is examined in a bit more detail, though still informally, in Appendix F of this user guide.

[3] Note, though, that the first ligature suppression method, `{}`, does *not* work if the document is compiled with LuaLaTeX, and that the italic-correction method can produce inferior results if the text is being typeset in, well, the italic font shape.

environment, the input files have to be closed prior to running the preprocessor scripts on them; then the files have to be re-opened in order to recompile them. Second, the presence of `"|` macros in the input may interfere with the work of programs such as spell checkers. Third, AFAICT none of the ligature-suppressing preprocessor packages I'm familiar with have been written to handle ligature suppression for English language texts. Fourth, their scope generally seems to be limited to the most basic f-ligatures (ff, fi, fl, ffi, and ffl), making them less than fully useful for fonts that provide further f-ligatures, such as ft and fft, or "rare" ligatures such as st and sp. Fifth, they usually require access to auxilliary programs (e.g., a UNIX environment and a `perl` distribution in the case of the rmligs package) that need not be present on a given user's computer.

What has *not* been available so far is a LaTeX package that performs selective ligature suppression while avoiding the drawbacks associated with the preprocessor approach. Such a package should provide lists of language-specific word patterns for which ligatures should be suppressed, and it should systematically discover, during compilation, all words to which these patterns apply and proceed to suppress the indicated ligatures. Such a package should, at a minimum, be able to handle the basic f-ligatures (ff, fi, fl, ffi, and ffl); given the increasing prevalence of ligature-rich Opentype fonts, it would be useful is the LaTeX package were also able to suppress additional f-ligatures, such as ft and fft, as well as rare ligatures. The package should also be reasonably easy to extend, in the sense that users should be able to augment or modify the ligature-suppression rules to suit their documents' characteristics. The selnolig package is meant to meet all of these goals and criteria.

The selnolig package provides rules to suppress *selectively* the following f-ligatures, for both English and German documents: 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 and Latin Modern font families, are frequently available in oldstyle (also known as "Garalde") font families.[4] Oldstyle-type font families generally feature a great variety of typographic ligatures. Given the beauty and growing popularity of these font families, it's important to be able to make good use of many of their features, including the presence of ligatures outside the "basic five" set.

In addition to supressing ligatures selectively for the f-ligatures mentioned above, the ligatures fb, fh, fj, fk, and *ij* are suppressed *globally* for both English and German language documents. Exceptions are provided, however, so as not to suppress these ligatures for selected words of *non-English/German* origin, such as Sognefjord, Dovrefjell, Prokofjew, Kafka, and *rijsttafel*.

For English language documents, the selnolig package recognizes two further options, `broadf` and `hdlig`. If `broadf` is set, additional f-ligatures will be suppressed selectively. If `hdlig` option is set, selective ligature suppression is performed on discretionary/rare ligatures such as ct, st, sp, *sk*, *th*, *at*, *et*, *ll*, *as*, *es*, *is*, and *us*. No rules are currently provided to suppress historic or disrectionary/rare ligatures for German documents.[5]

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[4]In some oldstyle font families, the ligatures "ft" and "fft" are rendered as "ft" and "fft", respectively.

[5]A remark on the classification of typographic ligatures in Opentype fonts. The f-ligatures are generally labelled "common" in most font families. Beyond this group, however, there appears to be little or no standardization across Opentype fonts as to which typographic ligatures should be labelled historic and which ones should be labelled discretionary/rare. For instance, the font families Latin Modern Roman, Garamond Premier Pro, and Hoefler Text report having "just" discretionary ligatures. In contrast, the font families Junicode, Cardo, EB Garamond, and Palatino Linotype all report having both historic and discretionary ligatures. The name of the package option `hdlig`, where *h* and *d* stand for *historic* and *discretionary*, respectively, is intended to convey a sense of agnosticism as to how non-common ligatures should be labelled.

Because no claim as to the completeness of the package's English or German language rules is or can be made, the selnolig package also makes it straightforward for users to provide their own supplemental ligature suppression rules, to treat words that occur in their documents but aren't (yet) covered by the package.[6]

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

The remainder of this document is organized as follows. Section 2 provides instructions for loading the selnolig package and making one's document(s) suitable for compilation under LuaLaTeX. The package's overall approach to suppressing ligatures is explained in Section 3, the user macros are presented in Section 4, and options that affect the package's workings are discussed in Section 5. Section 6 addresses additional issues that may arise when looking to break up typographic ligatures. The package's ligature suppression rules for English and German language documents are listed in Appendices A and B. The package's main "style" file, selnolig.sty, and lua code, contained in the file selnolig.lua, are listed in Appendices C and D. Appendix E provides a suggested template for reporting bugs and other issues with the package.

Finally, Appendix F provides lists of ligature-containing words caught by selnolig's rules in six English-language and three German-language literary classics. The English pieces are *The Origin of Species* by Charles Darwin, *David Copperfield*, *Bleak House*, and *Nicholas Nickleby* by Charles Dickens, and *Call of the Wild* and *The Sea Wolf* by Jack London. The German pieces are *Die Buddenbrooks* by Thomas Mann, and *Faust*, both *Part I* and *Part II*, by Johann Wolfgang Goethe.[7] Probably unsurprisingly to most, the German language pieces contain far more words for which various f-ligatures should be broken up than do the English language pieces.

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 enable a "basic" set of rules to suppress f-ligatures selectively, load the package by issuing the following instruction in the preamble of your document:

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

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

  If you want to load a set of f-ligature suppression rules that's broader than the set that's enabled by default, be sure to also specify the option broadf; see Section 5.2. If "historic" and/or "discretionary" ligatures (e.g., ct, st, sp, *th*, *ij*, *ll*, *sk*, *at*, *et*, *as*, *es*, *is*, and *us*) are enabled for your text font(s), be sure to specify the option hdlig. The options broadf and hdlig may be specified independently.

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

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[6]Please feel free to email me any such words so that I can augment and update the package's ligature suppression rules suitably. A suggested template for reporting issues with the selnolig package is provided in Appendix E.

[7]I selected these pieces entirely subjectively, and make no claim as to any kind of the representativeness of this selection—literary, statistical, or otherwise!

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

Options synonymous to `ngerman` are `german`, `au|strian`, `nau|strian`, `swi|ssgerman`, and `swi|ss`.

- 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 in 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, you will need to provide your own ligature suppression rules. This approach is called for if you write in a language other than German or English—the only two languages currently supported by the selnolig package—and are able to devise your own ligature suppression rules using selnolig's `\nolig` and `\keeplig` macros.

2.2   Any hints on how to get started with LuaLaTeX?

The ligature suppression macros of the selnolig package *require* the use of LuaLaTeX; they will not work under either pdfLaTeX or XƎLaTeX. If the selnolig package is not run under LuaLaTeX, a warning message will be issued and only the package's supplemental hyphenation rules will be available to the user.

  If you've been using pdfLaTeX until now, the requirement to use LuaLaTeX will likely force you to make some changes to your existing documents. Fortunately, these changes should be 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. The two most important changes you'll need to make are:

(i)   Do not load either the `inputenc` or the `fontenc` package.

(ii) Be sure to load the `fontspec` package,[8] and use `\setmainfont`, `\setsansfont`, and related commands to load the fonts you wish to use.

  Depending on your TeX distribution, the default font family used by LuaLaTeX will be either Computer Modern or Latin Modern. (This is true of pdfLaTeX as well, of course.) If you wish to use a different font family, issuing some font-related instructions will be required. *How* to specify fonts and font families and set up various font-related options in LuaLaTeX are topics that go far beyond the scope of this user guide. I urge you to become familiar with the very well-written user guide of the fontspec package.

  You will also need to use a TeX distribution that features a fairly recent version of LuaLaTeX. TeXLive 2013, TeXLive 2012, and MiKTeX 2.9 satisfy this requirement; versions of TeXLive before 2011 probably do not.

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

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[8] 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.

```
lualatex myfile
```

rather than either `latex myfile` or `pdflatex myfile` to initiate compilation. If you use a text editing program with pull-down menus or buttons to invoke a suitable compiler, 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 (actually, a package loaded by LuaLATEX) has to create various cache files to store font-related information. Subsequent compilation runs should be much faster.

The answers to the questions entitled Frequently loaded packages: Differences between pdfLATEX and LuaLATEX? and Using LuaTEX as a replacement for pdfTEX, both posted to tex.stackexchange.com, provide lots of very useful information for people who are new to LuaLATEX and are at least somewhat familiar with pdfLATEX. Another great resource for people who wish to become more familiar with LuaLATEX is A Guide to LuaLATEX 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 you use the babel package, be sure to load selnolig *after* babel; that way, the supplemental hyphenation patterns provided by the selnolig package won't get clobbered by babel's hyphenation settings.[9]

LuaLATEX natively supports the so-called UTF-8 input encoding scheme. In fact, UTF-8 is also the *only* input encoding scheme that LuaLATEX knows about. Nowadays, many modern TEX-aware editors support UTF-8 directly; LuaLATEX and selnolig should have no problems with TEX files produced by these editors. Older files, however, may employ input encoding schemes incompatible with UTF-8. If your input files currently use a different input encoding scheme, e.g., LATIN1, they need to be converted to UTF-8 before LuaTEX can process them properly. A number of methods exist to change a file's input encoding scheme. Please see the postings How to change a .tex file's input encoding system (preferably to UTF-8)? and Error message about an invalid utf-8 sequence (LuaLaTeX on a Mac) on tex.stackexchange.com for several such methods.

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`.[10] It is also assumed that you use the triple-f (modern) spelling of words such as `Schifffahrt`,[11] `Stofffarbe`, and `grifffest` and the double-t (modern) spelling of words such as `Mannschaftstest`.

Finally, all babel-style ""|"" ligature-suppressing shortcuts should either be removed entirely or be replaced with `\breaklig` instructions; the `\breaklig` macro is explained in Section 4.1.4 below.[12]

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[9]The selnolig package is also compatible with the hyphsubst package (which, if used, should be loaded with a `\RequirePackage` statement *before* the `\documentclass` instruction). Since mid-2013, one can also use the polyglossia package with LuaLATEX.

[10]TEXnically speaking, selnolig requires the use of ä, ö, ü, and ß only in the search strings of the ligature suppression rules.

[11]The selnolig package's German language rules are set to recognize words containing the old-spelling version `schiffahrt`; the ff ligature is not broken up for these words. However, most other words that have two f's in the old spelling and three f's in the new spelling don't get any special treatment in the package.

[12]On my LuaLATEX system, whenever a `"|` command is encountered, I either get a bad crash that requires a complete reboot of my computer (under MacTEX 2012) or a stern error message about "Forbidden control sequence found while scanning use of `\FancyVerbGetVerb`" (under MacTEX 2013).

3   The selnolig package's approach to breaking up ligatures

3.1   Free, derivational, and inflectional morphemes, and their relationship to ligature suppression

Good typography supports and enhances the readability of the typeset text. There are obviously a great many facets to how typography may contribute to good readability. One aspect is the ease with which readers can discern the *meaning* of the typeset text and its constituent parts—words. Because a typographic ligature groups two or more characters into a composite glyph, it is natural for the reader to "read" a ligature as forming a single unit and, moreover, to associate the ligature with some part of the word's meaning. Whereas this mental association of visual unity and meaning can be helpful when it comes to discerning the meaning of single-morpheme words,[13] it *may* detract from the word's readability if the word is composite and the ligature happens to span a morpheme boundary. Ligatures that span a morpheme boundaries *may* impair a composite word's readability if their presence make readers slow down and perform a "double take" in order to figure out which morphemes are used in the composite word.

What exactly are morphemes? Briefly put, morphemes are the smallest linguistic units in a word that carry *meaning*. Because words are, by definition, standalone units of text, each word contains at least one morpheme.[14] Morphemes are classified as *free* if they can stand alone as words (e.g., cat, dog, sea, see), and as *bound* if they can not. E.g., the letter s in the words cats, dogs, and rivers indicates the plural forms of the associated nouns; because the s particle cannot stand by itself as a word, it is a bound morpheme.

Bound morphemes can be divided further into derivational and inflectional morphemes. A *derivational* morpheme changes the meaning of the associated free morpheme in a fundamental way. E.g., the "un" in "untrue" serves to create a word with the opposite meaning of the free morpheme "true", and the "ful" in "shelfful" indicates the word is a quantity measure ("two shelffuls of books on typography", say). An *inflectional* morpheme signifies a less fundamental change in meaning. In nouns (and, depending on the language, adjectives as well), inflectional morphemes can indicate plural forms (child vs. children, cat vs. cats) and other forms of declination.[15] In verbs, inflectional morphemes indicate conjugation, such as a change in tense of the verb. E.g., call vs. called, walk vs. walked, but also "swim" vs. "swims", etc.

Words containing more than one morpheme can consist either of "just" free morphemes—rooftop, newspaper, etc.—or of free and bound morphemes joined together—untrue, shelfful, childish, laughs, etc. Bound morphemes generally occur either as prefixes or suffixes to the word's "main part" or "stem" (the free morpheme). Prefixes almost invariably represent derivational morphemes (e.g., untrue, review, perform). Suffixes, in contrast, can consist of free, derivational, or inflectional morphemes. For instance, the suffixes like and less in dwarflike and leafless are free morphemes, whereas the suffix ed in hounded and laughed is an inflectional morpheme.

It is important to realize that not all ligatures that span morpheme boundaries are equally inimical to good readability. Consider, say, the word *umbrellas*, which contains the ligature *as*. Note that this ligature

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[13] Some examples of single-morpheme words containing a ligature are off, fit, flat, office, baffle, left, act, cost, and spin.

[14] Please don't try to get me involved in a discussion of what it may mean to have words without meaning...

[15] In modern English, the virtually sole type of declination is to indicate plural status. In other languages, declination can also occur to indicate genitive, dative, accusative, etc. forms of nouns *and* adjectives. E.g., in German one says das schöne Kind, des schönen Kindes, dem schönen Kinde, etc. The particles en/es and en/e represent inflectional morphemes associated with the genitive and dative forms of the nouns and adjectives.

spans the boundary between the free morpheme *umbrella* and the suffix *s*. Nevertheless, I'm quite confident that very few will claim that the presence of the *as* ligature detracts from the readability of the plural word *umbrellas*. I believe there are two reasons why this particular word's readability is not impaired by the presence of a morpheme-spanning ligature. First, the suffix *s* is an inflectional morpheme: it "merely" serves to change the noun's state from singular to plural; clearly, most of the composite word's meaning is conveyed by the free morpheme *umbrella*. Second, the ligature occurs at the very *end* of the word rather than, say, closer to the beginning or middle of the word; by the time the eye reaches the *s* character, most of the word's meaning will already have been perceived.

Because not all morpheme-spanning ligature are equally problematic in terms of their impact on a composite word's readability, the selnolig package follows rules that leaves some ligatures untouched, while others are broken up. The package adopts the following broad principles.[16] First, ligatures that span the boundary of two free morphemes are always suppressed. Second, ligatures that cross the boundary between a free morpheme and a derivational morpheme are also suppressed—with certain exceptions that are explained below. Third, ligatures that span the boundary between a free morpheme and an inflectional morpheme are generally not suppressed. In below, the third principle is shown to be particularly relevant for decisions related to the (non)suppression of ft and fft ligatures in certain German words.

3.2   Sidebar: Morpheme boundaries, syllable boundaries, and ligature suppression

Observe that morphemes need not coincide with *syllables*, and hence that morpheme boundaries need not coincide with syllable boundaries and/or permissible hyphenation points. Indeed, words can contain several syllables but consist of only one morpheme (e.g., apple, orange, banana), or they can contain only one syllable but consist of two or more morphemes. E.g., the words "cats" and "dogs" each contain two morphemes, and the single-syllable word "twelfths" contains three morphemes (the free morpheme twelve, the derivational morpheme th, and the inflectional morpheme s).

The fact that a ligature may span a syllable boundary in no way implies that the ligature should be suppressed. Consider, for instance, the German words Affe, Griffel, Kaffee, Koffer, Löffel, Muffel, and Schiffe: All feature a syllable boundary and hyphenation point between the two f's. Nevertheless, none of the ff ligatures need be broken up, because the ff character pair doesn't span a morpheme boundary in any of these words. Or, consider the following German words that feature ft ligatures: bekräftigen, duftend, haften, heftig, Lüftung, and vergiftet. The ft ligatures are not suppressed because the ft pairs don't span morpheme boundaries.

Should TeX need to hyphenate some of the words listed in the preceding paragraph to generate a well-typeset paragraph, it can of course do so—and break up the ff and ft ligatures in the process. There's no need, though, to break up a ligature just because hyphenation *might* occur at that point. As always, there's no meaningful rule without at least one exception; in "Interlude I" in below, I discuss what *Duden* calls ambiguous cases for which ligature suppression follows syllable boundaries.

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[16] For English language texts, I am unaware of documents issued by an official or quasi-official body that prescribe whether or not ligatures that span morpheme boundaries should be suppressed. If anybody can provide such a reference, I would be happy to list it. For German texts, I believe that the *Duden* provides authoritative rules related to selective ligature suppression. However, as I explain below, *Duden*'s rules do not seem to cover all contingencies.

To further highlight the critical importance of morpheme boundaries for matters of ligature suppression, consider the words single-syllable words fifths and twelfth. The ft ligature is broken up for these words because it spans a boundary between a free morpheme (five and twelve, respectively) and a derivational morpheme (th). The fact that there's no syllable boundary is immaterial.

3.3 selnolig's ligature suppression rules: English language case

1. Typographic ligatures—both "common" f-ligatures and "rare" ligatures such as ct, st, and sp[17]—are suppressed if the following conditions apply:

   (a) if two free morphemes are joined: halfline → halfline, halflife → halflife, cufflink → cufflink, halftone → halftone, pastime → pastime, houndstooth → houndstooth, Charlestown → Charlestown, painstaking → painstaking, arctangent → arctangent, passport → passport, newspaper → newspaper, Hyannisport → Hyannisport, clothespin → clothespin, *seastrand → seastrand, Catskills → Catskills, Peekskill → Peekskill,*[18] etc.

   (b) if a prefix and main word are joined: offload → offload, mistake → mistake, mistrust → mistrust, displease → displease, suspend → suspend, *asea → asea, ultrasound → ultrasound*, etc.

   Note: If the main word, etymologically speaking, starts with sp or st, the sp and st ligatures *are* used even if the prefix ends in s: disperse, dispirit, distant, distill, distress, etc.

   (c) if a main word is followed by a suffix beginning with f or l other than ly: shelfful → shelfful, leafless → leafless, dwarflike → dwarflike, leaflet → leaflet, *soulless → soulless, seallike → seallike*, etc.

   Note that the suffixes used above—`ful[l]`, `less`, `let`, and `like`—are all free morphemes. In contrast, the short suffix `ly`, if used to make adjectives into adverbs, is a derivational morpheme. The fl ligature is thus *not* broken up for words such as briefly and chiefly (unless the `broadf` option is set; see below).

   (d) If the main word ends with an f and the suffix starts with an i, the fi and ffi ligatures are *not suppressed* (unless, again, the `broadf` option is set). Examples: elfin, selfish, fluffily.

   (e) The ft ligature is also suppressed for words that end in fth or fths: fifth → fifth, twelfths → twelfths. Note that the particle `th` contained in these words is a derivational morpheme.

2. If the `broadf` package option is set—as is the case for this user guide; after all, it's written to demonstrate the package's capabilities—the selnolig package will also suppress

   (a) fi and ffi ligatures if the main word ends in f and the suffix starts with an i: elfin, selfish, golfing, surfing, beefier, fluffily, fluffiness, goofiness, standoffish, jiffies, buffiest, etc.;

   (b) fl and ffl ligatures in adverbs ending in fly and ffly, such as chiefly, briefly, and gruffly; and

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[17] to disable rare ligatures, the option `hdlig` has to be enabled

[18] The relevant morpheme in the last two words in this list is `kill` (from an old Dutch word for stream), not `skill`.

(c) ﬅ ligatures in words such as fifty and fiftieth.

The option `broadf` is *not* enabled by default. This is because I believe that any gains in readability that might result from breaking up the f-ligatures caught by the `broadf` rules are likely to be minor and aren't worth running the serious risk of creating unsightly visual clashes caused by unligated ﬁ, ﬃ, ﬂ, and ﬄ glyphs.

3. If the package's `hdlig` option is set, an additional ligature-suppressing principle is activated: The ﬅ and ﬆ ligatures are suppressed for words with Greek roots that contain the character triples `sth` and `sph`; examples: isthmus and atmosphere. Typesetting these words as isﬆhmus and atmoﬆphere, i.e., with the very distinctive looking ﬅ and ﬆ ligatures, risks reducing their readability, because doing so would obscure the presence of the `th` and `ph` character pairs which derive from single Greek letters θ/ϑ and ϕ/φ, respectively. For these words, then, it seems advisable to suppress the ﬅ and ﬆ ligatures even though, strictly speaking, no morpheme-crossing issues are involved.

4. In addition, as is explained in more detail in Section 5.5, the ligatures fb, fh, fj, and fk are suppressed *globally* for English language documents. This is done because there seem to be no words of *English* origin for which these ligatures do not span a morpheme boundary. However, these ligatures are not suppressed for certain words of non-English origin, such as Kafka, fjord, and fjell.

3.4 Ligature suppression rules: German language case

For German words, the following rules apply when it comes to deciding which ligatures to break up and which ones to permit in composite words. These rules are built mainly from statements found in the *Duden* and various websites that have taken an interest in this subject—with adaptations for the ﬅ and ﬆ ligatures.

1. Ligatures that span the boundary of two free morphemes are suppressed. Examples: Senﬀabrik → Senffabrik, Impﬀurcht → Impffurcht, Schilﬁnsel → Schilfinsel, Zupﬁnstrument → Zupfinstrument, Ablauﬂogik → Ablauflogik, Baustoﬃngenieur → Baustoffingenieur, Wasserstoﬃonen → Wasserstoffionen; Zwölﬃngerdarm → Zwölffingerdarm; Stoﬄappen → Stofflappen; Schorﬄecken → Schorfflecken; Brieﬅaube → Brieftaube, elﬅeilig → elfteilig, Stoﬅtasche → Stofftasche, etc.

2. Joining of a prefix (whether a free or a derivational morpheme) ending in `f` and a main word (free morpheme) starting with `b`, `f`, `h`, `i`, `j`, `k`, `l`, or `t`: Ligatures are suppressed. By far the most common prefix that gives rise to the need to suppress various f-ligatures at the junction of a prefix and main word is the word "auf", as in aufbrechen, auffassen, Aufführung, auffliegen, auffischen, aufhören, aufisst, aufjaulen, aufklingen, Auflage, Auftrag, auftreten, etc.

3. Case 3: Joining of a main word (free morpheme) ending in "f" or "ff" and a suffix (either a derivational or an inflectional morpheme) starting with "f", "i", "l", or "t".

   (a) Suffixes (bound morphemes) that start with an "f", e.g., `-fach` and `-faltig`: The ff-ligature is suppressed. Examples: fünffach and zwölffaltig.

(b) Suffixes (bound morphemes) that start with an "i", e.g., `-ig`, `-in`, and `-isch`: The fi and ffi ligatures are *not* suppressed. Examples: streifig, äffisch, Chefin, Chefinnen.

I haven't found a clear justification for this rule so far. I assume the rule is there because unligated fi and ffi character pairs are potentially sufficiently unsightly to make them stand out as an infraction against good typography that's even more grievous than having fi and ffi ligatures that span the boundary between a main word and a suffix.

(c) Suffixes that start with an "l", e.g., `-lich`, `-ling`, `-lein` and `-los`: The fl-ligature is suppressed. Example words: trefflich, höflich, Prüfling, Köpflein, and straflos.

- *Interlude I*: In ambiguous cases that could give rise to fl-ligatures that involve certain suffixes, according to *Duden* preference should be given to "how the syllables are pronounced and how a word would be hyphenated". For instance, *Duden* says that the fl-ligature should be suppressed in the words Verzweiflung, Bezweifler, schweflig, and würflig.[19]

  This convention may also be applied to justify the non-use of the fl-ligature in words such as knifflig and mufflig as well as in the present-tense/first-person-singular forms of the verbs büffeln, löffeln, schaufeln, stiefeln, verteufeln, and zweifeln: these form are typeset *without* the fl/ffl-ligature, i.e., as büffle, löffle, schaufle, stiefle, verteufle, and zweifle, respectively.

- *Interlude II*: If a word *ends* with an `fl` character pair because an abbreviation is in effect, *Duden* says it's OK to use the fl-ligature even if the f and l characters belong to different morphemes. E.g., in the abbreviation "Aufl.", the fl-ligature *is* employed even though the ligature should not be used for the full, unabbreviated form of the word, *viz.*, Auflage.

  Although not stated explicitly by *Duden*, I believe the convention mentioned in the preceding paragraph may be extended to justify the use of the ff-ligature in the abbreviated word "Auff." (full form: Aufführung—no ff ligature) and of the ft-ligature in "Auft." (full form: Auftrag—no ft ligature).

  This convention further suggests (implies?) that it's permissible (a) to use the ff ligature in surnames that end in `ff`, such as Orff and Hausdorff, and (b) to use the ffi- and ffl-ligatures in abbreviated names such as Steffi and Steffl.

---

[19]Note that the real suffixes in these words are ung, er, and ig—not lung, ler, and lig. Justifying the suppression of the fl-ligature for these words is thus not a simple matter of not letting a ligature span the "gap" between a main word and suffix. In my opinion, the rationale generally given for suppressing the fl-ligature in these cases—reliance on how the syllables are divided and how the composite words are hyphenated—is not entirely satisfactory. This is because, morphologically speaking, the main words Schwefel, Würfel, and Zweifel each contain two morphemes: a stem and the *derivational* morpheme el: `Schwef|el`, `Würf|el`, and `Zweif|el`. It is therefore not necessary, in my opinion, to create a new rule to justify the (non-)use of the fl-ligature for these cases. Given the presence of two morphemes in each of the main words, one could simply rely on the general rule of not letting ligatures span morpheme boundaries within the main words to motivate the suppression of the fl-ligature for words such as schweflig, würfle, and Verzweiflung, as their morphological components are `schwef|[e]l|ig`, `würf|[e]l|e`, and `Ver|zweif|[e]l|ung`.

It's fair to say, though, that most modern German speakers are only vaguely aware of the fact that the el particle constitutes a morpheme in words such as Würfel and Griffel—and that they are probably entirely unaware of this fact for words such as Schwefel and Zweifel. To be sure, the typographical convention adduced by *Duden* for suppressing the fl-ligature in words such as schweflig, Verzweiflung, and würfle does *not* appear to be based on the fact that letters f and l in these words belong to different morphemes.

(d) Suffixes (derivational or inflectional morphemes) starting with t. Unfortunately, not much official wisdom seems to exist to guide this case, possibly because the ft and fft ligatures are not (yet?) used as widely as are the other f-ligatures. The following four rules, and especially the second one, should therefore be understood to be somewhat provisional.

    i. The convention mentioned in "Interlude II" above, about not breaking up an fl-ligature if it occurs at the very end of a word (as in "Aufl."), may be extended to apply to the case of ft and fft ligatures as well, i.e., they are not suppressed *if* they occur at the very ends of words (or word fragments that have separate meaning), as in verschärft, gestreift, gerafft, Dahingerafftsein, unbedarft, and Unbedarftheit.
Note that the ft and fft ligatures span a morpheme boundary in these cases: the single-letter second morpheme, the letter t, is an *inflectional* morpheme that indicates a form of conjugation of the associated verb (viz., past tense and/or past participle).

    ii. Should ft and fft ligatures be broken up in past tense and past-participle forms of verbs that do not end in ft but, instead, in -fte, -ften, -ftes, -ftest, etc? Example words: `streifte`, `rafften`, and `schlürftest`. Because these suffixes are "merely" *inflectional* rather than derivational morphemes, the selnolig package does *not* break up the ft and fft ligatures in these cases either. Thus, the words will be typset as streifte, schlürftest, and rafften rather than as streifte, schlürftest, and rafften.[20]

    iii. Again appealing to the convention mentioned in "Interlude II", it would also seem OK to use the ft-ligature in expressions such as "zu fünft" and "die zwölftschnellste Sprinterin Bayerns": Even though the t at the end of `fünft` and `zwölft` is a *derivational* morpheme, the ft ligature also occurs at the very end of the word or word fragment. In the case of the word "zwölftschnellste", the argument for keeping the ft ligature may also be based, in part, on the observation that the entire fragment "zwölft" is a prefix to "schnellste"; grouping the t character visually to its stem, zwölf, via an ft-ligature surely helps to enhance the overall readability of the sixteen-character word zwölftschnellste, right?

    iv. In contrast, the ft-ligature should *not* be used in "Beethoven's Fünfte Sinfonie" and "zum elften Mal". The argument for breaking up the ft-ligature in the words "Fünfte" and "elften" rests on the fact that the particles `te` and `ten` are derivational morphemes and that the ft ligatures are no longer at the very end of the word (or word fragment). The justification for breaking up the ft ligatures does not rest on the that the syllable boundaries (and hyphenation points) happen to fall between the letters f and t.

4. A free morpheme *ends* in ft (e.g., Saft, Kraft, Luft, Duft, Haft, and Vernunft) and is joined either to another free morpheme or to a suffix that's a bound morpheme. Example words: `Saftladen`, `Säfte`, `Kraftfahrzeug`, `Luftagentur`, `duftend`, `bekräftigen`, `Haftung`, and `vernünftig`. Because the ft character pair doesn't cross a morpheme boundary, the selnolig package does *not* break up the ft ligature. Thus, the words are typeset as Saftladen, Säfte, Kraftfahrzeug, Luftagentur, duftend,

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[20] I haven't yet come across any kind of authoritative discussion of this specific case. Should someone be able to furnish a good counterargument to the setting proposed here, I would be happy to change the settings accordingly.

bekräftigen, Haftung, and vernünftig. The fact that a *syllable boundary* occurs between the letters f and t in these words should not affect the decision to employ the ft (or fft) ligature.

5. In addition, as is explained in more detail in Section 5.5, the ligatures fb, fh, fj, and fk are suppressed *globally* for German language documents. This is done because there seem to be no words of *German* origin for which these ligatures do not span a morpheme boundary. However, these ligatures are not suppressed for selected words of non-German origin, such as Kafka, Sognefjord, and Dovrefjell.

4   Structure of the selnolig package

4.1   The main user commands

The four main user macros of the selnolig package are called `\nolig`, `\keeplig`, `\uselig`, and `\breaklig`. The first two macros are meant to be used in the preamble to set up ligature-suppression rules that apply on a document-wide basis. The latter two may be used within the body of the document on an *ad hoc* or case-by-case basis to either override (in the case of `\uselig`) or supplement (in the case of `\breaklig`) the rules set up by `\nolig` and `\keeplig` instructions.

The package also provides four additional, ancillary user commands. The instructions `\debugon` and `\debugoff`, described in more detail in Section 6.3, turn on and switch off logging of the activity of the selnolig package. The directives `\selnoligon` and `\selnoligoff`, described in Section 6.4, turn on and switch off selnolig's ligature-suppressing algorithms.

4.1.1   The `\nolig` macro

The package's main user macro is called `\nolig`. Each `\nolig` instruction, or rule, takes two arguments. The first is search string, and the second is a string that contains one or more "|" characters to indicates where in the search string the non-ligation "whatsits" should be inserted. E.g., the instruction

    \nolig{lfful}{lf|ful}

sets up a rule to suppress the ff-ligature in words such as "shelfful", "bookshelfful", and "selffulfilling".[21]

It is possible (and permissible) to have more than one | character in the second argument of a `\nolig` instruction. For instance, one *could* specify the rule `\nolig{Auflaufform}{Auf|lauf|form}` to suppress both the fl- and the ff-ligature in the words Auflaufform and Auflaufformen. For added flexibility, though, the selnolig package's German language rules actually uses separate `\nolig` rules to suppress the ff and fl ligature in this word; see Section 6.3 for the precise format of the rules that affect the word Auflaufform.

It is also possible to use Lua-style wildcard characters in the search string, as long as the wildcard characters occur *after* the non-ligation point. E.g., the file selnolig-german-patterns.sty sets up the rules

---

[21]TeXnically speaking, the `\nolig` macros perform their job by inserting special "whatsits" into the input stream whenever a pattern match occurs. These whatsits prevent the paragraph-building algorithm from replacing the affected character pairs (or triples) with corresponding ligatures. The package's `\keeplig` macro, described below, works by removing any nonligation whatsits from the input stream whenever a pattern match occurs, thereby re-enabling the use of ligatures.

```
\nolig{Dorff[aäeiloöruü]}{Dorf|f}
\nolig{dorff[aäeiloöruü]}{dorf|f}
```

to search for words that contain the strings `Dorff` and `dorff` followed by a letter in the set aäeiloöruü.[22] Incidentally, it is not strictly necessary, in the second argument of the `\nolig` command, to provide any material *after* the vertical bar that indicates the non-ligation point. However, the readability of your `\nolig` rules may suffer if you don't list that material.

If you examine the `\nolig` rules provided in the files selnolig-german-patterns.sty and selnolig-english-patterns.sty, you'll notice soon that there's some redundancy built in, in the sense that some words' ligatures will be broken up by more than one rule. For instance, the need to suppress the ff-ligature in "auffallen" happens to be met by both `\nolig{auff}{auf|f}` and `\nolig{ffall}{f|fall}`. This redundancy is deliberate, as not all words that might fit the first pattern (e.g., auffangen) will also fit the second (e.g., Straffall). Providing some redundancy seems like a reasonable way to proceed to keep the *overall number* of `\rules` somewhat manageable.

As with all LaTeX instructions, the arguments of `\nolig`, `\keeplig`, and `\uselig` commands are case-sensitive.

4.1.2 The `\keeplig` macro

The macro `\keeplig{<string>}` allows users to create rules that override `\nolig` rules selectively: for words that contain fragment `<string>`, the corresponding `\nolig` rule will not be executed. For a `\keeplig` rule to work properly, then, the command's argument must be a string that includes *as a subset* a string treated by one or more `\nolig` rules.

The `\keeplig` macro is very useful tool because it permits devising a (much) smaller set of broader, i.e., less restrictive, `\nolig` rules; any Type-II errors that may arise from having `\nolig` rules whose scope is too broad can be undone by providing judiciously crafted `\keeplig` rules.[23]

Consider the following example: If the ngerman language option is set, the selnolig package uses the rule

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

to break up the fl-ligature in a multitude of words that end in the suffix `lich` (a derivational morpheme): begrifflich, beruflich, brieflich, glimpflich, hilflich, höflich, käuflich, sträflich, tariflich, trefflich, unerschöpflich, and verwerflich, to name but just a few. This `\nolig` rule, incidentally, also (correctly) catches the word "Lauflicht", which contains the free morphemes `Lauf` and `licht`.

However, the scope of this `\nolig` rule is a bit too broad (or, if you will, it is insufficiently restrictive) because it also catches certain words, such as `Pflicht` and `verpflichten`, for which the fl-ligature should *not* be suppressed. Rather than provide a large number of more restrictive `\nolig` rules aimed at avoiding catching the Pflicht- and pflicht-words, the package provides the simple command

```
\keeplig{flicht}
```

---

[22] In case you're curious: These particular, some complicated looking search strings are used to avoid suppressing the ff-ligatures in words that *end* in either `Dorff` or `dorff`, as would be the case with the surnames Dorff and Hausdorff.

[23] In the present context, a Type-II error is the suppression of a ligature that is, in fact, valid for the word at hand.

This rule tells selnolig to override the action of the `\nolig{flich}{f|lich}` rule for all words that contain the string `flicht`. Most words affected by this `\keeplig` rule happen to contain the strings "Pflicht" and "pflicht". In addition, this rule also helps preserve the fl-ligature in words such as "flichst" and "verflicht" (the second- and third-person-singular forms of the verbs flechten and verflechten, respectively).

It is important to be aware of the following fact: It is *not necessarily* the case that ligatures contained in the argument of a `\keeplig` rule will indeed be used in words that contain that argument. Why?! It is because, as was noted above, *more than one* `\nolig` rule can apply to a given word. Consider, say, the word `Lauflicht` that was mentioned earlier: it is caught both by `\nolig{flich}{f|lich}` and by `\keeplig{flicht}`. The rule `\keeplig{flicht}` undoes the action of `\nolig{flich}{f|lich}` for the word `Lauflicht`. Fortunately (but not by accident), this word is also caught by the rule `\nolig{aufl}{auf|l}`.[24] Because the string `aufl` is *not* a subset of the string `flicht`, `\keeplig{flicht}` does *not* undo the action of `\nolig{aufl}{auf|l}`. As a result, the word `Lauflicht` ends up being typeset—correctly!—as Lauflicht, i.e., *without* the fl-ligature.

We see that the rule `\keeplig{flicht}` is a bit too broad in its own right, as it would enable the use of the fl-ligature in composite words where one morpheme ends in `f` and the second morpheme is `Licht`. How selnolig deals with `Lauflicht` was mentioned in the preceding paragraph. The selnolig package provides further `\nolig` rules to deal with other composite nouns containing the morpheme `Licht`, such as Natriumdampflicht and Sumpflicht. (Fortunately there aren't too many such words...)

4.1.3 The `\uselig` macro

The selnolig package also provides the user command `\uselig`, which acts very much like the `\keeplig` command to override the action of a `\nolig` rule. However, it does so purely on a one-off basis. E.g., the command `\uselig{fj}` will typeset "fj" even if the rule `\nolig{fj}{f|j}`—which suppresses the `fj` ligature on a global, i.e., document-wide basis—is active; without `\uselig`, you'd get the unligated "fj" character pair.

You should use `\uselig` instructions only for single words and word fragments; don't use them for longer stretches of text. If you need to suspend the operation of the ligature suppression macros for longer stretches, including entire paragraphs or more, you should use the macros `\selnoligoff` and `\selnoligon`, which are described in more detail in Section 6.4.

4.1.4 The `\breaklig` macro

The macro `\breaklig`, which doesn't take an argument, is provided as a hopefully easy-to-remember substitute for the lower-level LATEX command "`\-\hspace{0pt}`". 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 suppress a ligature on an ad-hoc basis *without* introducing a potential hyphenation point, insert the instruction "`\kern0pt`".

For instance, to suppress the *sk* ligature in the word `groundskeeper` on a one-off basis, one might enter it as "`grounds\breaklig keeper`" in order to obtain *groundskeeper* rather than *groundskeeper*. To suppress the *sk* ligature for this word as well as for words such as *greenskeeper* and *miskeep* throughout the entire document, one could issue the directive `\nolig{skeep}{s|keep}`; the package provides just such a rule.

---

[24]Recall that the package's German language ligature suppression rules are set up in the file selnolig-german-patterns.sty.

4.2   Components of the selnolig package

The selnolig package consists of code distributed across several files:

- The main "driver" file is called selnolig.sty. It sets up the package's main user macros that were explained in detail in the preceding subsection.

- The package's `lua` code is in the file selnolig.lua.

- The ligature suppression rules for English and German language documents are contained in the files selnolig-english-patterns.sty and selnolig-english-patterns.sty, respectively.

- Supplemental hyphenation exception patterns, mostly for composite words that involve ligatures that are suppressed by the package's `\nolig` rules, are contained in the files selnolig-english-hyphex.sty and selnolig-english-hyphex.sty.

- The user guide—the document you're reading right now—is provided in the file selnolig.pdf; the associated source code is in the file selnolig.tex.

- Ancillary files: the files selnolig-english-test.tex and selnolig-german-test.tex load selnolig.sty 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. Assuming your TEX distribution is either TEXLive or MiKTEX, you can access these files by typing `texdoc selnolig-english-test` or `texdoc selnolig-german-test` at a command prompt.

The "driver" file selnolig.sty starts by setting up several Boolean switches to structure the processing of options. After processing the options, it loads the file selnolig.lua, which contains the package's lua code, and sets up the user macros discussed above.

The remaining steps in the startup process depend on which language-related options were selected:

- If *no* language-specific options are in effect, the setup process terminates. Users may, of course, provide their own `\nolig` and `\keeplig` rules and use the commands `\uselig` and `\breaklig` as they see fit.

- 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 detailed list of `\nolig` and `\keeplig` rules adapted to English language typographic usage; Appendix A provides a complete listing of these rules. 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 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 suppression rules appropriate for German typographic usage; Appendix B lists its contents. The latter file provides additional hyphenation rules for German-language words.

- 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.

The following is an admittedly rough and rather imperfect indication of just how much more complex the task is of creating a set of ligature suppression rules for German than it is for English: As of the mid-May 2013 version of the selnolig package, the "basic" set of English language ligature suppression rules for "common" f-ligatures consists of 32 \nolig and 17 \keeplig directives.[25] In contrast, the set of German language ligature suppression rules for "common" f-ligatures consists of roughly 700 \nolig and 335 \keeplig directives. A ratio of roughly 1:20 in terms of detail and complexity!

5   Additional ligature-related matters

5.1   The noftligs option

By default, the selnolig package will load rules to suppress ft and fft ligatures selectively, for both English and German documents. In case you want to suppress these two ligatures *globally* rather than selectively, you could specify the option noftligs when loading the package. Doing so will make the package set up the simple rule \nolig{ft}{f|t} rather than load many separate rules for suppressing ft ligatures selectively.[26] You may also wish to specify the noftligs option if the font you use in your document doesn't even feature ft and fft ligatures.

5.2   English language case: The broadf and hdlig options

The ligature suppression patterns for English language words, contained in the file selnolig-english-patterns.sty and listed in Appendix A below, are grouped into four parts. The first two parts concern the suppression of 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.

As noted in Section 3.3 above, for English language documents only the fairly limited number of f-ligature suppression rules contained in Part 1 of the file is enabled by default. This is done because eliminating the morpheme-crossing f-ligatures caught if the broadf option is set does not appear to be a major concern in English-language typography. There simply doesn't appear to be a need to suppress the fi (ffi) ligature words that end in f (ff) followed by the particles -ing, -ish, -ier, -iest, -ily, and -iness. Any gain in readability resulting from suppressing these fi and fl ligatures would appear to be more than offset by unsightly visual clashes created by the unligated fi, ffi, fl, and ffl combinations.

Part 3 of the file selnolig-english-patterns.sty, which is enabled if the hdlig option is set, provides ligature suppression rules for the ct, st, and sp ligatures. Examples are words such as arctangent (not: arctangent), painstaking (not: painstaking), mistake (not: mistake), and trespass (not: trespass).

---

[25] Including the rules that are activated if the broadf and hdlig options are both activated, the tally rises to about 420 \nolig and 52 \keeplig instructions.

[26] For German language documents in particular, suppressing ft and fft ligatures *globally* may help speed up compilation noticeably, as there will be roughly 180 \nolig and 60 \keeplig instructions fewer to run on the document.

Setting the `hdlig` option also enables ligature suppression rules for additional discretionary ligatures such as *th*, *at*, and *et*. These ligatures might be deemed inappropriate for use in words such as *lighthouse, pothole, aromatherapy, albatross, ninety,* and *nonetheless*. With the `hdlig` option set, these words will be typeset as *lighthouse, pothole, aromatherapy, albatross, ninety,* and *nonetheless*. Ligature suppression rules are provided for the following discretionary ligatures, which occur only in the *italic* font shape of the font families used in this document: *th*, *at*, *et*, *as*, *is*, *us*, *ll*, *fr*, and *sk*. Part 3 of Appendix A lists these rules.

Part 4 of the file selnolig-english-patterns.sty, which is also processed if the `hdlig` option is set, deals with cases where one discretionary typographic literature, say *as*, might pre-empt the use of a more appropriate but trailing 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 improperly spanning a morpheme boundary; instead, it is the possibility that TEX might pre-empt one typographic ligature with another ligature within one and the same morpheme. This issue is discussed in more detail in Section 5.6 below.

5.3 Composite words with ambiguous morphology

Some composite words can be made up of two different morpheme pairs, or even morpheme triples. For instance, the German 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 helps indicate the intended meaning of the composite words. For words such as these, software isn't smart enough to discern which possible meaning is intended.[27] Writers, of course, could choose to insert explicit hyphen characters to indicate the intended meaning.

The preceding two examples each involve pairs of free morphemes. More complicated cases can occur too. For instance, the composite word `Surftes|t` can have a meaning that involves a free morpheme and an inflectional morpheme (indicating the past-tense use of the verb), whereas the other meaning involves two free morphemes. Consider the questions "Surftest Du vergangene Woche in Hawaii?" and "Hat die Athletin den Surftest bestanden?" In the second question, it would clearly be wrong to use the ft-ligature; the word `Surftes|t` is therefore entered as "`Surf\breaklig test`" in that question.

An even more complicated example is the word `Chef‌innenleben`, which contains three morphemes. This word can be deconstructed either as `Chefinnen-leben` ("lives of female bosses") *or* as `Chef-innenleben` ("inner life, or lives, of a boss"); the word's middle particle—"innen"—can function both as a suffix to "Chef" and as a prefix to "Leben". Only in the second case is it wrong to use the fi-ligature.

It turns out that the rules of the selnolig package are set so as *not* break up the fi-ligature in the shorter words Chefin and Chefinnen, in keeping with the principle that the fi-ligature is permitted for suffixes that start with an "i". In contrast, selnolig will break up the fi-ligature in the longer words Chefinnenleben and Chefinnenräume; in these cases, the working assumption is that innen acts as a prefix to the third morpheme (Leben or Räume). If this is *not* what you want, i.e., if you really do mean to refer to lives or spaces of female bosses, be sure to use `\uselig{fi}` instructions to preserve the fi-ligatures. Better yet, use explicit hyphens: Chefinnen-Leben and Chefinnen-Räume. And, while you're at it, do consider writing the other forms as Chef-Innenleben and Chef-Innenräume. Your readers will thank you.

---

[27] 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 as follows: `\uselig{Sauf‌laden}` and `Wachs\breaklig tube`.

Summing up: Some composite words are morphologically ambiguous. For such words, it is (currently) not possible to program software to decide unambiguously whether or not ligatures that might occur in the words should be suppressed. The best advice I can give is to be on the lookout for such words and to take corrective action should selnolig's choices be wrong.

5.4   How to provide additional ligature suppression patterns

As already noted, it's not possible to claim that the non-ligation rules provided in selnolig-english-patterns.sty and selnolig-german-patterns.sty are complete or, for that matter, will *ever* be complete. If you come across words containing ligatures that ought to be suppressed but aren't caught (yet) by the selnolig package, you could do the following. First, you could insert \breaklig instructions to suppress the ligatures on a case-by-case basis; conversely, if you discover an instance for which selnolig improperly breaks up a ligature, you could override that action by encasing the character pair (or triple) in a \uselig statement. Second, you could create your own \nolig and \keeplig rules to deal with the cases you've discovered on a document-wide basis. A third option, naturally, is to bring this case to the attention of the maintainer of the selnolig package and ask him/her to update the package's ligature suppresssion rules...

To give an extended example of how one might go about augmenting the set of ligature-suppression rules already provided by the selnolig package, suppose that you've been tasked with preparing a special edition of Thomas Mann's novel *Der Tod in Venedig*. Suppose further that you have chosen to use an "Antiqua" ("Roman") font—which, naturally, features a ligature for the ffl character triple—to typeset this special edition, because fewer and fewer people nowadays can manage to read with ease text set in a period-appropriate blackletter font. During your preparations, you happen to notice (i) that the novel contains the word inbegriffleitend[28] and (ii) that the selnolig package does not (yet) provide a rule that suppresses the ffl-ligature for this word.

To meet the need to suppress the ffl-ligature in inbegriff|leitend, you could insert a \breaklig instruction, i.e., enter it as "inbegriff\breaklig leitend". (Doing so isn't inefficient in the present example because the word inbegriff|leitend occurs exactly once in the novel.) Alternatively, you could devise a new \nolig rule to catch this word. For instance, you could add the following \nolig rule (to be inserted in your document's preamble, after the selnolig package has been loaded) to suppress the ffl ligature in inbegriff|leitend as well as in the far more common words Jugendtreff|leiter and Kuns|ts|toff|leitung:

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

With this rule in place, the words will be typeset as inbegriffleitend, Jugendtreffleiter, and Kunststoffleitung, respectively. Just in case this discussion has made you curious: the file selnolig-german-patterns.sty provides the more general (i.e., less restrictive) rule \nolig{fleit}{f|leit} to catch these words.

When designing your own \nolig and \keeplig rules, you would ideally do so in a way that ensures that the rules are neither too specific (and hence only apply to a very small set of words) nor too general

---

[28]This word really does occur in the aforementioned novel! This novel may very well also be the *only place* ever where you'll encounter this word. I performed a Google search for the term "inbegriffleitend"; the only hits, apart from online editions of the novel itself, were the sites of a couple of French bloggers who agonized over how this word might possibly be translated from German to French...

(and hence end up applying to words for which the rule wasn't meant to apply). Of course, this may be easier said than done. Consider, say, what would happen if you came up with the rule

```
\nolig{flei}{f|lei}
```

This rule would certainly succeed in breaking up the ffl-ligature in the words inbegriffleitend, Jugendtreffleiter, and Kunststoffleitung. It will also break up the fl-ligature in Laufleistung, Häuflein, Kreislaufleiden, Scherflein, and many more words. However, this rule would also *incorrectly* break up the fl-ligature in many other words, including fleissig/fleißig, fleischig, Hackfleisch, and Diplomfleißarbeit; I believe most German readers would prefer to see these words typeset *with* the fl-ligature, i.e., as fleissig/fleißig, fleischig, etc. When in doubt, try to err on the side of making your \nolig rules a bit too restrictive.

5.5   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.[29]

For instance, suppose that you are typesetting a Turkish text. The Turkish alphabet features both a dotted i and a dotless ı character. I understand that in Turkish typesetting practice, the fi and ffi ligatures should *never* be employed, so as to avoid creating any doubts as to whether it's an i or an ı character that follows the "f" character. To satisfy the need of Turkish typography for global suppression of the fi and ffi ligatures, one could place the following instruction in the document's preamble:

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

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 into ffb, ffh, ffj, and ffk, respectively), you could do so by issuing the following commands:

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

In fact, as was already mentioned in Section 3, these commands are activated automatically if the ngerman or english language options are set. This is done because I was unable to come up with a single word of *German* or *English* origin involving these character combinations that doesn't also entail a morpheme boundary collision.

Of course, your document may contain words *not* of German or English origin that contain some of these character pairs and do not involve a morpheme boundary crossing. For such words, it is not necessary to suppress the corresponding ligatures. For instance, in the word Kafka, one may not wish to suppress the

---

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

fk-ligature for this specific word. The selnolig package provides \keeplig rules to preserve the fk-ligature in names such as Kafka, Safka, Piefke, Potrafke, Sprafke, Shirafkan, Tirafkan, and Rifkin.[30]

Your documents may also feature words of *Nordic* origin that contain the fj character pair, such as Sognefjord and Dovrefjell. Because the fj character pair 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. The package therefore provides \keeplig rules to take care of (a) words that contain the particles fjord, fjör, fjell, and fjäll and (b) names such as Eefje, Sufjan, Prokofjew, and Astafjew.

A "rare" typographic ligature that may warrant global suppression, at least for English language documents, is *ij*.[31] To the best of my knowledge, a morpheme boundary crossing occurs for all English language words that contain the ij character pair: *antijam*, *bijection*, *demijohns*, and *hijack*. By the logic set forth above, this ligature should therefore be suppressed for these words. The *ij* ligature also seems inappropriate for most words that came into English from languages such as French (e.g, *bijou*), Japanese (e.g., *gaijin*), and Spanish (e.g., *jipijapa*, Panama hat; and *marijuana*, Maryjane[32]). The *ij* ligature is therefore suppressed *globally* by the selnolig package if the options english and hdlig are set. However, the *ij* ligature does get used a lot in *Dutch*. The selnolig package therefore issues various \keeplig directives so that this ligature isn't suppressed for some names and words of Dutch origin, such as *Eijkhout*, *de Bruijn*, and *rijsttafel*.[33]

5.6   What if one ligature pre-empts a trailing, more appropriate ligature?

If a font provides many discretionary ligatures, the likelihood is high that words will occur for which the use of a ligature for the first two characters of a character *triple* incorrectly pre-empt the use of a more appropriate ligature for the last two characters of that triple.[34]

The selnolig package provides numerous \nolig rules to fix issues of ligature pre-empting, focusing on the 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 main text font used for this user guide (Garamond Premier Pro). Other ligature-rich fonts may provide further possibilities for the ligature for the first two characters of a character triple inappropriately pre-empting the ligature for the triple's trailing character pair.[35]

---

[30]Aside: It is my recollection that Felix Lehmann's desire to preserve the fk ligature in the name "Kafka" stimulated the creation of the package's \keeplig macro. Of course, once the \keeplig macro was created, all kinds of further uses for it followed rapidly.

[31]For many fonts I'm familiar with, including the one used for this user guide, the ij character pair is available in the upright font shape as a *digraph* rather than as a true, i.e., joined-up, ligature.

[32]What?! Are you really thinking of a different meaning of this word? How come??

[33]The word *rijsttafel*, incidentally, features three consecutive "rare" ligatures. Another word that contains three rare ligatures, though not consecutive ones, is *isthmus*.

[34]To be sure, the issue of one ligature pre-empting a more appropriate ligature is not limited to "discretionary" ligatures; it can also arise when dealing solely with "common" f-ligatures. Suppose, for instance, that a certain font provides ff, fi, and fl ligatures but no ffi and ffl ligatures. Consider how TEX would typeset words containing ffi and ffl character triples. 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).

[35]For the font Garamond Premier Pro, I have discovered the following, rather peculiar 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), LuaTEX gives preference to the trailing *is* ligature over the leading *fi* ligature, causing these words to be typeset as *fish* and *fist*, respectively. I can't tell if this is a conscious design feature or a bug in this font. The selnolig package overrides this behavior, i.e.,

Ligatures for *as*, *es*, *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* a|st, i|st, or u|st will see the first two characters ligated, pre-empting the use of a typographic ligature for the trailing *st* character pair. There are at least three distinct reasons why this outcome is not desirable.

First, given the rather distinctive look of the *st* ligature, the word `stocha|stic` may look a bit odd if the *st* ligature is used only once—*stochastic*—simply because the *as* ligature is allowed to pre-empt 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 pre-emption of the st doesn't arise—and once in italics: must and *must*; readers may prefer the look of must and *must*. Or, consider the words "historian" and "history" when typesetting them in italics: I'd say it's much better to typeset them as *historian* and *history* rather than as *historian* and *history*. Similarly, I suspect that Austrians and Australians—at least the ones who care about discretionary typographic ligatures—may prefer to see the name of their country typeset as *Austria* and *Australia* rather than as *Austria* and *Australia*. Finally: Do you prefer the look of *Do fast festive fists foster fustiness?* or that of *Do fast festive fists foster fustiness?* You prefer the latter look too? Great!

Third, there may be cases where an *as* ligature both pre-empts a subsequent *st* ligature *and* spans a morpheme boundary, as in the words *astride*, *infrastructure*, and *seastrand*. The readability of such words definitely increases if the *as* ligature is suppressed: *astride*, *infrastructure*, and *seastrand*.

The selnolig package is set to give preference to the distinctive-looking *st* ligature over *as*, *is*, and *us* ligatures. To this end, the following \nolig rules are provided:[36]

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

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

The same three reasons for not letting *as*, *es*, *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 rules to ensure that the *sp* ligature is used in words such as *clasp*, *hasp*, *raspberry*, *teaspoon*, *wasp*, *espionage*, *hispanic*, *crisp*, *lisp*, *whisper*, and *cusp*.

---

it is set to give preference to the leading *fi* ligature over the trailing *is* ligature for words that contain the strings fi|st and fi|sh; hence, they'll be typeset as *fish* and *fist*, respectively.

Note that if the broadf option is set, as is the case for the document you're currently reading, a side effect of this setting is that words such as *deafish, dwarfish, elfish, oafish, selfish, unselfish, 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. This loss is, hopefully, not too serious.

[36]The second of these three commands, while correct for most words that contain the string i|st, unnecessarily suppresses the *is* ligature for words for which the *st* character pair crosses a morpheme boundary, e.g., words that start with *dis-t...*—e.g., *distend, distribute, distrust, disturb*—or with *mis-t...*—e.g., *mistake, mistranslate, mistype*. (Note that separate \nolig rules already suppress the st/*st* ligature for these words.) At this time there are no plans to address this (overall hopefully minor?) issue.

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 first *at* ligature pre-empts the *th* ligature. The same happens for words such as *bath*, *Kathryn*, and *pathology*. Given both the commonness and the distinctive pronuciation of the th character pair in the English language, as well as the high frequency of the *th* character pair in words of Greek origin (recall that the Latin-alphabet th character pair derives from the single Greek character θ/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, though, because doing so will also suppress the *at* ligature for words such as boathook, for which the *th* ligature would span a morpheme boundary and thus shouldn't be employed anyway. For such words, then, there's no need to suppress the *at* ligature. These cases are dealt with by providing specific \keeplig rules to re-enable the use of the *at* 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; however, 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 rules are provided to override the rule \nolig{eth}{e|th} for these words, so that they'll get typeset as *Beethoven*, *prophethood*, and *sweetheart*.[37]

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

There seem to be very few English words for which an *at* ligature might inappropriately pre-empt a *ta* ligature. One such word is atap; its readability is likely enhanced if it's typeset as *atap* rather than as *atap*.

Virtually all words for which an *et* ligature might inappropriately pre-empt the use of a trailing *ta* ligature appear to be words for which the *et* ligature crosses a morpheme boundary and should be suppressed. Examples are *betake*, *betatter*, *bristletail*, *caretaker*, *detach*, *dovetail*, *foretaste*, *pretax*, *retable*, *retack*, *retard*, *retarget*, *timetable*, and *wiretap*. The *et*-related ligature suppression rules already put in place to deal with morpheme boundary crossing cases should therefore suffice to catch these cases as well.

Do be on the lookout for cases of persons' names which include the string eta and for which the trailing *ta* ligature should not be pre-empted by the leading *et* ligature. For instance, the author of this package prefers to see his surname typeset as *Loretan* rather than as *Loretan*…

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[37] Note that this method works if the font being used provides both *et* and *th* ligatures. If the text font you employ provides only a *th* ligature but no *et* ligature, these \keeplig rules should be disabled.

6   Further issues

6.1   Known bugs

I'm not sure if the following constitutes a bug or "merely" a case of incompatibility between LATEX packages. The selnolig package does not interact well with the LATEX packages ngerman and german. Fortunately, the selnolig package *does* interact nicely with the babel package if one of the options ngerman, german, austrian, naustrian, swissgerman, or swiss is set. Unless someone can convince me that using the ngerman or german packages is preferable to using the babel package, I probably won't bother addressing this incompatibility.

6.2   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, -f-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 currently still the shorter of the two. The German word list is shorter in part because it is assumed that writers of German-language documents use the babel package and select the option ngerman (or one of the synonymous language options); doing so also loads specialized hyphenation patterns suitable for German texts.[38]

It is possible to instruct selnolig *not* to load the package's hyphenation exception lists. You may want to do so, for instance, if you must use UK-English hyphenation patterns and therefore shouln't use the US English-based hyphenation patterns provided by the package. (To the best of my knowledge, most of the hyphenation patterns employed 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. (I am obviously not trying to make it too easy to invoke this option ...)

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 via the usual \usepackage statements without having to load the entire selnolig package.

6.3   How to track what the selnolig package is doing

If you execute the command \debugon, detailed information about each \nolig and \keeplig pattern match that is encountered is written to the .log file. Note that the default setting is \debugoff, i.e., the package's activity is not recorded by default to the .log file.

Because of the redundancy built into some of the package's \nolig commands, it is possible that more than one pattern match will occur for a given word. E.g., for the verb "auffahren", two separate \nolig

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[38] As was already noted earlier, the selnolig package is also compatible with the hyphsubst and polyglossia packages.

commands apply simultaneously, *viz.*, \nolig{auff[aeiloruyäöü]}{auf|f} and \nolig{ffahr}{f|fahr}.
For this word, then, the following information is written to the `.log` file:

```
pattern match: auffahren - auff[aeiloruyäöü]
pattern match: auffahren - ffahr
Do ligature suppression for: auffahren
Inserting nolig whatsit before glyph: f
Last char: n
```

Some words contain more than one potential 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 encoun-
tered, 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 - flauf
pattern match: Auflaufform - Aufl[aeiouyäöü]
pattern match: Auflaufform - auff[aeiloruyäöü]
pattern match: Auflaufform - fform
Do ligature suppression for: Auflaufform
Inserting nolig whatsit before glyph: l
Inserting nolig whatsit before glyph: f
Last char: m
```

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

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

If more than one \nolig rule *as well as* a \keeplig rule apply to a given word, as is the case for the word
"Streiflicht", the following information is written to the `.log` file:

```
pattern match nolig and keeplig: Streiflicht - flich - flicht
pattern match: Streiflicht - reifl
Do ligature suppression for: Streiflicht
Inserting nolig whatsit before glyph: l
Last char: t
```

Observe that the first nolig rule's pattern, flich, is overridden by the keeplig rule's pattern flicht. The
second nolig rule's pattern, reifl, is *not* overridden, and it is the debugging-related information associated
with the second \nolig rule that ends up being written to the `.log` file.

To terminate or suspend the writing of the debugging-related information to the `.log` file, execute the
command \debugoff. To restart the logging of this information, issue the command \debugon.

6.4 Suspending and restarting the operation of selnolig's macros

By default, selnolig's macros are switched on (assuming, of course, that your document is compiled under LuaLATEX). If you want to suspend their operation, you should issue the command

```
\selnoligoff
```

at the desired point in your document. For instance, in this document the command \selnoligoff is issued at the start of the appendices. This is done because most of the material in the appendices (which contain mostly listings of lua and LATEX code) is typeset using a monospaced font for which all typographic ligatures have been disabled up front. Hence, there's no need to disable any ligatures selectively in that part of the document, is there?

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

```
\selnoligon
```

In this document, this is done at that start of Appendix F, which provides a long list of words found in *Die Buddenbrooks* for which f-ligatures should be suppressed.

6.5 Lists of words that fit German and English non-ligation patterns

Extensive lists of German and English language words for which one or more ligatures should be suppressed are provided in the supplemental files selnolig-german-test.pdf and selnolig-english-test.pdf. As was already mentioned in Section 4.2, these documents may be viewed by opening a command window and typing texdoc selnolig-german-test and texdoc selnolig-english-test.

The list of words in selnolig-german-test.pdf consisted initially almost entirely of the words provided by the rmligs script. However, I've added quite a few more words to that list in the meantime. Thanks to the great work of Felix Lehmann and Steffen Hildebrand explained in more detail in Section 7, the package's German language ligature-suppression rules now apply to a much larger set of words than what's listed in selnolig-german-test.pdf. Naturally, suggestions for still more words to be de-ligated are always welcome.

6.6 Making suggestions and reporting bugs

Feedback on the selnolig package is always welcome, whether for making general suggestions, heaping praise on the package's author, or for reporting bugs and other problems. Emailing me about selnolig will definitely get my attention. I'm also a fairly active participant (handle: "Mico") on tex.stackexchange.com, and I occasionally check what goes on in TeXwelt.de, comp.text.tex and de.comp.text.tex. In case I appear to miss any selnolig-related discussions on these sites, please don't hesitate to contact me to alert me to them.

When reporting what you believe to be shortcomings and/or mistakes with the package's ligature suppression rules, please use a structure similar to the template given in Appendix E of this document.

If anyone is thinking of creating rules to suppress ligatures selectively for languages other than English and German and would like to make use of the "machinery" provided by the selnolig package, I'd be delighted to provide reasonable amounts of programming-related assistance.[39]

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[39] A promising candidate (in my view at least) for getting the selnolig treatment would be **blackletter** or 𝕱𝖗𝖆𝖐𝖙𝖚𝖗 fonts and their special ligatures. When used to write German documents, it is well known that these ligatures need to be suppressed for certain

The latest versions of all files that comprise the selnolig package may be found at the package's GitHub site. What's there may be slightly more up to date than what I manage to push to selnolig's CTAN page.

7   License and acknowledgments

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".

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.stackex-change.com.[40] Without their help and support, this package would not exist. They certainly deserve most of the credit for the lua code used by the selnolig package.

Felix Lehmann (a linguist and expert in morphology, i.e., the study of morphemes) and Steffen Hildebrandt (computer scientist extraordinaire) served as patient and careful testers of several early beta versions of this package, uncovering and fixing bugs, pointing out unclear passages in the user guide, writing scripts to automate the discovery of redundancies and syntax errors in the package's \nolig and \keeplig rules, and providing many excellent suggestions for improving the package. Steffen also provided crucial modifications to the package's lua code to make possible the \keeplig and \uselig macros.

Equally importantly, Felix and Steffen created scripts to test systematically and comprehensively the package's German \nolig and \keeplig rules for linguistic adequacy and (relative) completeness. They began with a corpus of almost 850 million [!!] German words, which they marked up with information on the morphological 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 analysis, an early version (October 2012) of the selnolig package already 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![41,42]

Fortunately for me, they quickly discovered that a non-negligible part of the 69,000 errors wasn't real but, rather, the result of spelling errors in the words included in the corpus and/or of suspect morphological analysis. Moreover, the detailed Type I and Type II error lists they generated were critical in helping me refine—and occasionally revise completely—the package's \nolig and \keeplig rules, rapidly bringing down the number of Type I and II errors. For instance, after Steffen wrote the lua code that made possible the \keeplig macro, the single rule \keeplig{flicht} eliminated, in one fell swoop, more than 10,000 [really!] Type II errors generated by the package's initial suppression of the fl-ligature in words that contain the morpheme pflicht. All major changes to the German language ligature suppression patterns are still being subjected to their testing algorithms, streamlining the tasks of detecting what's left to improve and catching any newly introduced errors.

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words, i.e., selectively. E.g., to suppress the tz (tz) ligature for the words Brotzeit, Nachtzeit, and Tatzeit, one could set up the rule \nolig{tzeit}{t|zeit}. If somebody wants to take on this project, I'd be happy to help you get started.

[40]See especially the questions Any suggestions/requests for features for a new package that allows disabling ligatures for (pre)selected words?, How to suppress the operation of a luatex-defined macro on a string if the string is part of macro or a label, and Ligature suppression algorithm fails if the word in question contains an Umlaut (dieresis) before the ligature.

[41]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 improper suppression of a typographically appropriate ligature.

[42]1,000 words contained more than one potential f-ligature, hence the difference.

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Felix and Steffen started the automated testing of the package's `\nolig` and `\keeplig` rules as their finals project for the course *Introduction to Computational Linguistics* at the University of Massachusetts at Amherst which they attended in the fall of 2012.[43] They wish to thank the Institut für Maschinelle Sprachverarbeitung at the Universität Stuttgart for granting them a license for the morphological analysis tool SMOR[44] 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,[45] 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 perl script, by Björn Jacke, lists about 1,700 German language words for which various f-ligatures should be suppressed.[46] I wrote selnolig's initial set of German-language `\nolig` rules primarily to capture the words listed in rmligs.

Matthias Vogel very kindly shared with me a set of regular-expression based ligature suppressing macros, named Ligatures-German, he wrote for the WinEdt programmer's editor. Matthias's macros work by inserting babel-style `"|` ligature-suppressing directives in the appropriate places in the `.tex` file, which can then be compiled with pdfLaTeX. These macros, and a file he sent me containing an extensive list of German words for which one or more f-ligatures should be suppressed, led me to thoroughly refine and extend the scope of the selnolig package's German language ligature suppressing rules.

Barbara Beeton provided very detailed comments on an early version of the package's user guide and its English language ligature suppression rules. She also noted that the readability of my surname might be enhanced if it were typeset as *Loretan* instead of as *Loretan*... David Bellows provided a suggestion that led me to extend some of the `\nolig` rules in Part 2 (activated by setting the option broadf) of the file selnolig-english-patterns.sty.

Other contributors who posted answers and comments to various ligature-related questions I've asked occasionally on tex.stackexchange.com and comp.text.tex, too numerous to name individually, also helped influence the genesis of this package. To all of you, I express my sincere thanks.

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[43] Both their code and their finals paper are available online.

[44] Schmid, H., A. Fitschen, and U. Heid, 2004, "SMOR: A German Computational Morphology Covering Derivation, Composition, and Inflection", *Proceedings of the IVth International Conference on Language Resources and Evaluation (LREC)*, pp. 1263–1266, Lisbon, Portugal.

[45] Baroni, M., 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.

[46] All versions of the rmligs package are archived at `http://www.j3e.de/ispell/igerman98/dict/`.

Appendices

A   English-language ligature suppression rules: selnolig-english-patterns.sty

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


\ProvidesPackage{selnolig-english-patterns}%
[2013/08/31]


% 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{eaflet}{eaf|let}
 % leaflet(-s, -ed) leafleting
 % leafletting leafletted
 % leafleteer(s)


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


\nolig{otfload}{otf|load}
 % for the 'luaotfload' package...


% (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

\if@noftligs
\else % suppress these ligatures selectively...
  \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)


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

  \nolig{eaftr}{eaf|tr}
   % leaftrap

  \nolig{fftr}{ff|tr}
   % offtrack
\fi % end of \if@noftligs conditional block

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

% suppress these ligatures globally
\nolig{fb}{f|b}
\nolig{fh}{f|h}
\nolig{fj}{f|j}
\nolig{fk}{f|k}

% But, make exceptions for fjord, fjell, etc
  \keeplig{fjord} % Norwegian spelling
```

```
  \keeplig{fjör} % Icelandic spelling, e.g., in
        % Isafjördur and Ísafjörður
  \keeplig{fjarð} % Ísafjarðarbær (in Iceland)
  \keeplig{fjell} % Norwegian
  \keeplig{fjall} % Swedish (?)
  \keeplig{fjäll}
  \keeplig{fjöll}

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

% Further exceptions for names that contain 'fk'
  \keeplig{Kafka}
  \keeplig{Safka}
  \keeplig{Potrafke}
  \keeplig{Sprafke}
  \keeplig{Shirafkan}
  \keeplig{Tirafkan}
  \keeplig{Rifkin}




% Part 2: Additional f-ligature suppression
% patterns if the 'broadf' 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}
 \keeplig{elfink} % distelfink

% For words ending in -f-ing, allow for
% "colloquial" abbreviations (-f-in').
\nolig{afing}{af|ing}
\nolig{afin'}{af|in'}
 % chafing leafing loafing sheafing
 % strafing vouchsafing
```

```
\nolig{eefing}{eef|ing}                    \nolig{Deafish}{Deaf|ish}
\nolig{eefin'}{eef|in'}                     \nolig{Dwarfish}{Dwarf|ish}
% beefing reefing                          \nolig{Elfish}{Elf|ish}
                                           \nolig{Oafish}{Oaf|ish}
                                           \nolig{Serfish}{Serf|ish}
\nolig{iefing}{ief|ing}                    \nolig{Wolfish}{Wolf|ish}
\nolig{iefin'}{ief|in'}
% briefing debriefing
                                           \nolig{beefier}{beef|ier}
                                           \nolig{comfier}{comf|ier}
\nolig{ifing}{if|ing}                      \nolig{goofier}{goof|ier}
\nolig{ifin'}{if|in'}                       \nolig{gulfier}{gulf|ier}
 % coifing fifing jackknifing knifing       \nolig{leafier}{leaf|ier}
 % midwifing waifing wifing                 \nolig{reefier}{reef|ier}
                                           \nolig{surfier}{surf|ier}
                                           \nolig{turfier}{turf|ier}
\nolig{oofing}{oof|ing}
\nolig{oofin'}{oof|in'}
 % goofing hoofing roofing ...              \nolig{Beefier}{Beef|ier}
                                           \nolig{Comfier}{Comf|ier}
                                           \nolig{Goofier}{Goof|ier}
\nolig{lfing}{lf|ing}                      \nolig{Gulfier}{Gulf|ier}
\nolig{lfin'}{lf|in'}                       \nolig{Leafier}{Leaf|ier}
 % golfing rolfing selfing ...              \nolig{Reefier}{Reef|ier}
                                           \nolig{Surfier}{Surf|ier}
                                           \nolig{Turfier}{Turf|ier}
\nolig{rfing}{rf|ing}                       % (Mustn't perform 'fier -> f-ier'
\nolig{rfin'}{rf|in'}                        % substitution because of words
 % barfing bedwarfing dwarfing...           % such as pacifier, reifier, etc.)
 % kerfing enserfing ...
 % (wind-) surfing turfing
 \keeplig{tterfinger} % butterfinger        \nolig{fiest}{f|iest}
                                            \keeplig{fiesta}
                                            % leafiest beefiest reefiest ...
\nolig{rfism}{rf|ism}
 % dwarfism
                                           \nolig{fily}{f|ily}
                                            % beefily goofily
\nolig{rfist}{rf|ist}                       % This rule also catches the
 % dwarfist                                 %   ffily -> ff-ily case:
                                            % daffily fluffily gruffily ...
\nolig{deafish}{deaf|ish}
\nolig{dwarfish}{dwarf|ish}                \nolig{oofiness}{oof|iness}
\nolig{elfish}{elf|ish}                     % goofiness
 % elfish selfish unselfish, etc.           % (Mustn't do 'finess -> f-iness'
 \keeplig{angelfish}                        % substitution b/c of 'finesse')
 \keeplig{amselfish} % damselfish

                                           % (c) fl -> f-l
\nolig{oafish}{oaf|ish}
\nolig{serfish}{serf|ish}
\nolig{wolfish}{wolf|ish}                  \nolig{aloofly}{aloof|ly}
```

```
\nolig{briefly}{brief|ly}                    % (g) ffl -> f-fl
\nolig{chiefly}{chief|ly}                     % nothing additional in 'broad' group
\nolig{deafly}{deaf|ly}
\nolig{liefly}{lief|ly}                      % (h) ft -> f-t

\nolig{Aloofly}{Aloof|ly}                    \if@noftligs
\nolig{Briefly}{Brief|ly}                    \else % suppress some more ft ligatures selectively
\nolig{Chiefly}{Chief|ly}                      \nolig{ifteen}{if|teen}
\nolig{Deafly}{Deaf|ly}                          % fifteen fifteens fifteenth
\nolig{Liefly}{Lief|ly}
 % (Mustn't perform 'fly -> f-ly' subst.       \nolig{fifti}{fif|ti}
 % b/c of 'fly' 'butterfly' ...)               \nolig{Fifti}{Fif|ti}
                                                 % fifties fiftieth fiftieths
% (d) ffi -> ff-i
                                               \nolig{fifty}{fif|ty}
\nolig{affish}{aff|ish}                        \nolig{Fifty}{Fif|ty}
\nolig{offish}{off|ish}                          % fifty fiftyish
\nolig{iffish}{iff|ish}                       \fi % end of \if@noftligs conditional block
\nolig{uffish}{uff|ish}
 % draffish offish sniffish gruffish          \fi % end of \if@broadfset conditional block

\nolig{ffing}{ff|ing}
\nolig{ffin'}{ff|in'}
 % baffing biffing bluffing...                % Part 3: Discretionary ligatures crossing
                                              % morpheme boundaries
\nolig{ffier}{ff|ier}                         % st, ct, sp,
 % buffier chaffier ...                       % th, at, et, as, is, us, ta, ll, sk
                                              % ---------------------------------------
%\nolig{ffily}{ff|ily}
 % Caught by 'fily -> f-ily' rule             \if@hdligset

\nolig{ffiness}{ff|iness}                     % (A) st -> s-t
 % fluffiness huffiness puffiness             % -------------

\nolig{ffies}{ff|ies}                         \nolig{aspidistra}{a|spidi|stra}
 % baffies biffies jiffies stuffies ...       \nolig{Aspidistra}{Aspidi|stra}
 % buffiest chaffiest ...                     \nolig{osstalk}{oss|talk}
                                               % crosstalk
% (e) ffl -> ff-l                             \nolig{gstai}{gs|tai}
                                               % dogstail
\nolig{ffly}{ff|ly}                           \nolig{nstak}{ns|tak}
 % bluffly gruffly ruffly ...                  % painstaker painstaking
                                              \nolig{stight}{s|tight}
% (f) ffi -> f-fi                              % gastight
 % nothing additional in 'broad' group        \nolig{stooth}{s|tooth}
                                               % houndstooth
```

```
\nolig{steeth}{s|teeth}                          % mistime mistimed
 % houndsteeth                                   \nolig{istitl}{is|titl}
\nolig{astime}{as|time}                           % mistitle
 % pastime                                       \nolig{istook}{is|took}
                                                  % mistook
                                                 \nolig{istouc}{is|touc}
%%% dis-t... words                                % mistouch
\nolig{distast}{dis|tast}                        \nolig{mistrac}{mis|trac}
\nolig{Distast}{Dis|tast}                        \nolig{Mistrac}{Mis|trac}
 % distasteful                                     % Mistrace
\nolig{distem}{dis|tem}                          \nolig{mistran}{mis|tran}
\nolig{Distem}{Dis|tem}                          \nolig{Mistran}{Mis|tran}
 % distemperate                                    % Mistranscribe Mistranslate
\nolig{disten}{dis|ten}                          \nolig{mistrain}{mis|train}
\nolig{Disten}{Dis|ten}                          \nolig{Mistrain}{Mis|train}
 % distended                                       % mistrain
\nolig{distor}{dis|tor}                          \nolig{istrea}{is|trea}
\nolig{Distor}{Dis|tor}                           % mistreat mistreatment
 % distort distortion                            \nolig{mistru}{mis|tru}
\nolig{distra[cu]}{dis|tra}                      \nolig{Mistru}{Mis|tru}
\nolig{Distra[cu]}{Dis|tra}                       % mistrust mistruth
 % distract distraught                           \nolig{istrys}{is|trys}
\nolig{distrib}{dis|trib}                         % mistryst
\nolig{Distrib}{Dis|trib}                        \nolig{mistu}{mis|tu}
 % distribution                                  \nolig{Mistu}{Mis|tu}
\nolig{distrust}{dis|trust}                       % mistune Mistutor
\nolig{Distrust}{Dis|trust}                      \nolig{istyp}{is|typ}
 % distrust distrustful                            % mistype
\nolig{distu}{dis|tu}
\nolig{Distu}{Dis|tu}
 % disturb                                       \nolig{aastricht}{aas|tricht}
                                                  % Maastricht

%%% mis-t... words                               \nolig{sthes}{s|thes}
\nolig{mista}{mis|ta}                             % anaesthesia synesthesia prosthesis
\nolig{Mista}{Mis|ta}                            \nolig{sthet}{s|thet}
 % mistake mistaken mistaught unmistakable        % aesthetic esthetic unesthetic
\nolig{mistea}{mis|tea}                           % prosthetist
\nolig{Mistea}{Mis|tea}
 % misteach                                      \nolig{Esth}{Es|th} % Esther
\nolig{istend}{is|tend}
 % mistend distend                               \nolig{stown}{s|town}
\nolig{isterm}{is|term}                           % crosstown Williamstown
 % misterm misterms
\nolig{isth}{is|th}
 % misthink misthought misthrew misthrow
 % isthmus calisthenic                           % (B) ct -> c-t
\nolig{istime}{is|time}                          % -------------
```

```
\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 (cis-platin, not cisp-latin!)

\nolig{despot}{des|pot}
\nolig{Despot}{Des|pot}
 % despot despotic

%%\nolig{spresso}{s|presso}

 \nolig{despon}{de|spon}
 \nolig{Despon}{De|spon}
 \nolig{despir}{de|spir}
 \nolig{Despir}{De|spir}
 \nolig{despoil}{de|spoil}
 \nolig{Despoil}{De|spoil}
 \nolig{sidesp}{side|sp} % sidespin, sidesplitting
 \nolig{Sidesp}{Side|sp}
 \nolig{widesp}{wide|sp} % widespread
 \nolig{Widesp}{Wide|sp}
 \nolig{desprung}{Wide|sp} % gelandesprung

\nolig{dispa[rst]}{dis|pa}
\nolig{Dispa[rst]}{Dis|pa}
 % disparage disparaging dispart
 % dispassion dispatch
\nolig{dispel}{dis|pel}
```

```
\nolig{Dispel}{Dis|pel}
 % dispel
\nolig{dispen[ds]}{dis|pen}
\nolig{Dispen[ds]}{Dis|pe}
 % dispend dispense dispensation
\nolig{displa[cny]}{dis|pla}
\nolig{Displa[cny]}{Dis|pla}
 % display displant displace
\nolig{displea}{dis|plea}
\nolig{Displea}{Dis|plea}
 % displease displeasure
\nolig{displ[ou]}{dis|pl}
\nolig{Displ[ou]}{Dis|pl}
 % displode displume
\nolig{disp[ou]}{dis|p}
\nolig{Disp[ou]}{Dis|p}
 % disport dispose disposition
 % dispossess dispute
\nolig{dispr[aio]}{dis|pr}
\nolig{Dispr[aio]}{Dis|pr}
 % dispraise disprize disproof
 % disproportion disprove


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

\nolig{suspen}{sus|pen}
\nolig{Suspen}{Sus|pen}
 % suspend suspension

\nolig{sph}{s|ph} % 'ph' from Greek 'phi'!
 % atmosphere biosphere hemisphere
 % spherical asphodel phosphorous phosphate
 % blaspheme blasphemy

\nolig{ranspa}{rans|pa}
 % transparent transpacific
\nolig{ranspe}{rans|pe}
 % transpersonal
\nolig{ranspie}{rans|pie}
 % transpierce
\nolig{ranspl}{rans|pl}
 % transplant
\nolig{ranspol}{rans|pol}
```

```
 % transpolar                              % firsthand postharvest posthaste
\nolig{ranspor}{rans|por}                 \nolig{thawk}{t|hawk}
 % transport transportation                % nighthawk
\nolig{ranspos}{rans|pos}                 \nolig{horth}{hort|h}
 % transpose transposon                     % shorthair shorthand shorthorn
                                          \nolig{arthei}{art|hei}
\nolig{risprud}{ris|prud}                  % apartheid antiapartheid
 % jurisprudence                          \nolig{thead}{t|head}
\nolig{spiece}{s|piece}                    % bolthead cathead fathead ...
 % crosspiece frontispiece                \nolig{thard}{t|hard}
                                           % Gotthard
\nolig{ewsp[ae]]}{ews|p}                  \nolig{therd}{t|herd}
 % newspaper newsprint                      % goatherd neatherd
                                          \nolig{theap}{t|heap}
\nolig{Hyannisp}{Hyannis|p}                % dustheap
 % Hyannisport                            \nolig{theart}{t|heart}
\nolig{Keyesp}{Keyes|p}                    % fainthearted sweetheart ...
 % Keyesport                              \nolig{uthear}{ut|hear}
\nolig{Williamsp}{Williams|p}              % outhear outheard
 % Williamsport                           \nolig{thill}{t|hill}
                                           % anthill foothill
\nolig{assport}{ass|port}                 \nolig{thood}{t|hood}
 % passport                                % adulthood knighthood ...
                                          \nolig{thunt}{t|hunt}
                                           % pothunt outhunt
% (D) th -> t-h                           \nolig{orthol}{ort|hol}
% -------------                            % porthole
                                          \nolig{posth}{post|h}
\nolig{eethov}{eet|hov}                   \nolig{Posth}{post|h}
 % Beethoven                               % postharvest
\nolig{thook}{t|hook}                     \nolig{sthum}{st|hum}
 % boathook meathook pothook               % posthumous
\nolig{thouse}{t|house}                   \nolig{uthau}{ut|hau}
 % boathouse cathouse courthouse ...       % outhaul
\nolig{othol}{ot|hol}                     \nolig{uthit}{ut|hit}
 % foothold knothole potholder ...         % outhit
\nolig{lthol}{lt|hol}                     \nolig{uthom}{ut|hom}
 % bolthole                                % outhomer
\nolig{sthol}{st|hol}                     \nolig{uthow}{ut|how}
 % posthole pesthole                       % outhowl
\nolig{rathol}{rat|hol}                   \nolig{uthum}{ut|hum}
\nolig{Rathol}{Rat|hol}                    % outhumor
 % rathole                                \nolig{uthust}{ut|hust}
\nolig{arthog}{art|hog}                    % outhustle
 % warthog                                \nolig{tthour}{tt|hour}
\nolig{stha}{st|ha}                        % 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{ethink}{e|think}
 % freethinking
\nolig{ethrow}{e|throw}
 % freethrow
\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{eetop}{ee|top}
 % treetop
\nolig{etrain}{e|train}
 % detrain drivetrain housetrain retrain
\nolig{etrap}{e|trap}
 % firetrap livetrap mousetrap
\nolig{etree}{e|tree}
 % axletree saddletree shoetree

\nolig{foret}{fore|t}
\nolig{Foret}{Fore|t}
 % foretaste foretell foretold foretime
 % foretoken foretop foretopman
\nolig{imetable}{ime|table}
 % timetable

\nolig{reteen}{re|teen}
```

```
 % preteen                              \nolig{retir}{re|tir}
\nolig{retend}{re|tend}                 \nolig{Retir}{Re|tir}
 % pretend                               % retire retiring
\nolig{retenc}{re|tenc}                 \nolig{retitl}{re|titl}
 % pretence                             \nolig{Retitl}{Re|titl}
\nolig{retens}{re|tens}                  % retitle pretitling
 % pretense pretension
\nolig{retent}{re|tent}                 \nolig{retold}{re|told}
\nolig{Retent}{Re|tent}                 \nolig{Retold}{Re|told}
 % pretentious retention retentive       % retold
\nolig{retest}{re|test}                 \nolig{retoo}{re|too}
\nolig{Retest}{Re|test}                 \nolig{Retoo}{Re|too}
 % pretest retest                        % retook retool
                                        \nolig{retor}{re|tor}
\nolig{reta}{re|ta}                     \nolig{Retor}{Re|tor}
\nolig{Reta}{Re|ta}                      % retore retorn retort retorted
 % retag retape retake                  \nolig{retou}{re|tou}
 % foretaste caretaker                  \nolig{Retou}{Re|tou}
 % pretaste pretape pretaxretain         % retouch retouched
 % retain retake retaliate retard       \nolig{retra}{re|tra}
 % retarget retaste wiretap             \nolig{Retra}{Re|tra}
\keeplig{pretable} % interpretable       % retrace retrack retract retrans retransmit
\keeplig{cretar}  % secretary           \nolig{retre}{re|tre}
                                        \nolig{Retre}{Re|tre}
\nolig{reteam}{re|team}                  % pretreat retread retreat retrench
\nolig{Reteam}{Re|team}                 \nolig{retri}{re|tri}
 % reteam reteamed reteaming reteams    \nolig{Retri}{Re|tri}
\nolig{retear}{re|tear}                  % pretrim pretrial retrieve retribution
\nolig{Retear}{Re|tear}                  % retries retrim
 % retear retears                       \nolig{etrors}{e|trors}
\nolig{retemp}{re|temp}                  % retrorse
\nolig{Retemp}{Re|temp}                 \nolig{retrous}{re|trous}
 % retemper retempering                 \nolig{Retrous}{Re|trous}
                                         % retrousse
\nolig{retie}{re|tie}                   \nolig{retry}{re|try}
\nolig{Retie}{Re|tie}                   \nolig{Retry}{Re|try}
 % retie entireties sureties             % retry retrying
\nolig{retil}{re|til}
\nolig{Retil}{Re|til}                   \nolig{retu}{re|tu}
 % retile                               \nolig{Retu}{Re|tu}
\nolig{retim}{re|tim}                    % return retune unreturnable
\nolig{Retim}{Re|tim}                   \nolig{retwi}{re|twi}
 % retime beforetime                    \nolig{Retwi}{Re|twi}
\nolig{retint}{re|tint}                  % retwist retwisting
\nolig{Retint}{Re|tint}
 % retint                               \nolig{etooth}{e|tooth}
```

```
% bluetooth eyetooth snaggletoothed          % asepsis aseptic aseptically
\nolig{eteeth}{e|teeth}                       \nolig{asophist}{a|sophist}
 % snaggleteeth eyeteeth                       % ultrasophisticated
                                              \nolig{asound}{a|sound}
\nolig{deter}{de|ter}                          % ultrasound
\nolig{Deter}{De|ter}                         \nolig{asund}{a|sund}
 % deter determine deteriorate undeterred     \nolig{Asund}{A|sund}
                                               % asunder
\nolig{ceties}{ce|ties}                       \nolig{aspec}{a|spec}
 % niceties                                   \nolig{Aspec}{A|spec}
\nolig{cety}{ce|ty}                            % aspect infraspecific intraspecies
 % nicety                                      % intraspecific
                                              \nolig{infras}{infra|s}
\nolig{feties}{fe|ties}                        \nolig{Infras}{Infra|s}
 % safeties unsafeties biosafeties             % infrastructure infraspecific
\nolig{fety}{fe|ty}                           \nolig{megast}{mega|st}
 % safety                                     \nolig{Megast}{Mega|st}
                                               % megastructure megastar
\nolig{leties}{le|ties}                       \nolig{megasp}{mega|sp}
 % subtleties                                 \nolig{Megasp}{Mega|sp}
\nolig{lety}{le|ty}                            % megaspores megascopic
 % subtlety teletype teletypewriter           \nolig{aspoon}{a|spoon}
                                               % teaspoon
\nolig{rety}{re|ty}
 % surety entirety retype pretype

\nolig{etelev}{e|telev}                       % (H) is -> i-s
 % pretelevision                              % ------------
\nolig{etyp}{e|typ}
 % archetype archetypal retype pretype        % (a) not across morpheme boundaries
                                              % (The following may be a bug in fontspec)
% (G) as -> a-s
% -------------                               \nolig{fish}{fi|sh}
                                              \nolig{fist}{fi|st}
\nolig{asea}{a|sea}                           \nolig{Fist}{Fi|st}
 % asea
 \keeplig{casea} % caseease caseate           \nolig{ish}{i|sh} % many words...
 \keeplig{Casea}                              \nolig{ism}{i|sm} % many words...
 \keeplig{haseal} % phaseal                   \nolig{iss}{i|ss} % bliss kiss swiss mantissa...
\nolig{asplut}{a|splut}
 % asplutter
\nolig{eastran}{ea|stran}                     % (b) across morpheme boundaries
 % seastrand
\nolig{aspor[ae]}{a|spor}                     \nolig{antis}{anti|s}
 % diaspora megaspore tetraspore              \nolig{Antis}{Anti|s}
\nolig{asep[st]}{a|sep}                        % antisag antisatellite
                                               % antiscience
```

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```
% antisecrecy antisense antiseptic
% antishark antiship antishock
% antiskid
% antislavery antislip
% antismog antismoke
% antismuggling antismut
% antisnob
% antisocial antisolar
% antispasmodic antispeculative
% antistatic antistick antistress
% antisubmarine antisubversion
% antisymmetric antisyphilitics

\nolig{multis[a-z]}{multi|s}
\nolig{Multis[a-z]}{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
 \keeplig{isphr} % misphrase misphrased ...


% (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
\nolig{atskill}{ats|kill}
 % Catskills Mountains, Catskill Park
\nolig{eekskill}{eeks|kill}
 % Peekskill % a town on the Hudson River


% (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
\nolig{fframp}{ff|ramp}
 % offramp
\nolig{ffrail}{ff|rail}
 % taffrail


% (M) ij -> i-j
% -------------

% The 'ij' ligature seems to have no good
% use in English-language words. Hence we
% disable it globally.
% We do make exceptions for names and words
% of Dutch origin. In Dutch, the ij ligature
% is in fact quite appropriate...

\nolig{ij}{i|j}
 \keeplig{ijk} % Eijkhout (author of "TeX by Topic")
 \keeplig{ijn} % de Bruijn
 \keeplig{ijs} % rijsttafel (Indonesian dish, very
        % popular in the Netherlands)
 \keeplig{eije}% Meijer
```

```
% Part 4: Disabling one discretionary                    % crisp
% ligature so that a subsequent, more                    \nolig{ispani}{i|spani}
% important one doesn't get pre-empted                     % hispanic
% ----------------------------------                      \nolig{hispid}{hi|spid}
                                                          \nolig{Hispid}{Hi|spid}
% (i) as, is, and us preceding st                          % hispid hispidulous
% ..............................                          \nolig{lisp}{li|sp}
                                                          \nolig{Lisp}{Li|sp}
\nolig{ast}{a|st}                                          % lisp lisping
\nolig{ust}{u|st}                                         \nolig{whisp}{whi|sp}
\nolig{ist}{i|st}                                         \nolig{Whisp}{Whi|sp}
                                                           % whisper
% (ii) as, es, is, and us preceding sp                    \nolig{wisp}{wi|sp}
% ..............................-......                   \nolig{Wisp}{Wi|sp}
                                                           % wisp
\nolig{aspar}{a|spar}
\nolig{Aspar}{A|spar}                                     \nolig{cusp}{cu|sp}
 % asparagus Caspar aspartame asparkle                    \nolig{Cusp}{Cu|sp}
\nolig{asper}{a|sper}                                      % cusp bicuspid tricuspid
\nolig{Asper}{A|sper}                                     \nolig{ausp}{au|sp}
 % aspersion Casper Jasper exasperate                     \nolig{Ausp}{Au|sp}
\nolig{aspir}{a|spir}                                      % auspicious inauspicious
\nolig{Aspir}{A|spir}
 % aspire aspirator aspirin                               \nolig{Suspect}{Su|spect}
\nolig{gasp}{ga|sp}                                       \nolig{suspect}{su|spect}
\nolig{Gasp}{Ga|sp}                                        % suspect suspects
 % gasp                                                   \nolig{uspici}{u|spici}
\nolig{hasp}{ha|sp}                                        % suspicion suspicious
\nolig{Hasp}{Ha|sp}
 % hasp
\nolig{lasp}{la|sp}
 % clasp unclasp beclasp enclasp                          % (iii) at and et preceding th
\nolig{rasp}{ra|sp}                                       % ..........................
\nolig{Rasp}{Ra|sp}
 % grasp rasp raspberry                                   %% If you have 'at' and 'et' ligatures as
\nolig{wasp}{wa|sp}                                       %% well as the 'th' ligature and want a
\nolig{Wasp}{Wa|sp}                                       %% trailing 'th' ligature to take precedence
 % wasp waspish                                           %% over these ligs, use the following rules:

                                                          \nolig{ath}{a|th}
\nolig{espi[ct]}{e|spi}                                   \nolig{eth}{e|th}
 % despicable despite
%%% more rules to come...                                 % The preceding rules are a bit too
                                                          % broad as they also suppress the 'at' ligature
                                                          % for words such as boathook and flathead
\nolig{risp}{ri|sp}                                       % and the 'et' ligature in words such as
                                                          % Beethoven, prophethood, and sweetheart.
```

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```
% Thus, also provide some \keeplig macros:

\keeplig{oathook} % boathook                              % (iv) at and et preceding ta
\keeplig{eathook} % meathook                              % . . . . . . . . . . . . . . . . . . . . . . . . . . .
\keeplig{athouse} % bathouse boathouse cathouse
%%\keeplig{rathole} % this will re-enable "th" liga   \nolig{atap}{a|tap}
%%\keeplig{Rathole} %  if "at" liga doesn't exist...  \keeplig{catap} % catapult cataphoresis
\keeplig{athead} % cathead fathead flathead meathead \keeplig{Catap}
\keeplig{atherd} % goatherd neatherd                  \keeplig{ratap} % rataplan
\keeplig{eatheart} % greathearted                     \keeplig{Ratap}
\keeplig{eetheart} % sweetheart
                                                     \nolig{Loretan}{Lore|tan} % :-)
\keeplig{Beethoven}
\keeplig{ophethood}                                  \fi %% end of \@ifhdligset
```

B   German-language ligature suppression rules: 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}%
[2013/08/31]

% 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{Auff[aeiloruyäöü]}{Auf|f}
\nolig{auff[aeiloruyäöü]}{auf|f}
 % Hundreds (thousands?!) of words that
 % start with or contain [aA]uff-,
 % [kK]auff-, [lL]auf- and don't end
 % with "ff".
 % We must provide a few \keeplig macros,
 % though, to deal with some surnames and
 % some words of French origin.
 \keeplig{Lauffen}
```

```
\keeplig{Stauffach} % Stauffacher
\keeplig{Stauffen}  % Stauffenbergattentat
\keeplig{stauffen}
\keeplig{Stauffer}
\keeplig{stauffer}
\keeplig{Stauffisch}
\keeplig{stauffisch}

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

\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 (a statistician)
\nolig{cheffl[aiou]}{chef|fl}
\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{Hoffest}{Hof|fest}
 % Hoffest Hoffesterlös Hoffestteam
\nolig{Impff}{Impf|f}
 % Impffurcht Impffortbildung
\nolig{Kampff[aäeoöruü]}{Kampf|f}
\nolig{kampffaäeoöruü]}{kampf|f}
 % kampffertig Kampffigur
 % Kampffuchs Kampffüchse
  % Wahlkampffloskeln
\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 klopffrei
\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{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{chaffron}{chaf|fron}
 % Schaffron
\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}
 % Einzelknopfäden Tropffäden
\nolig{ffähig}{f|fähig}
 % hoffähig kampffähig lauffähig
\nolig{ffahn}{f|fahn}
 % Totenkopffahne Dorffahne Wahlkampffahnen
\nolig{ffahr}{f|fahr}
 % Schifffahrt Schleiffahrt Tariffahrplan
 \keeplig{iffahrt}
  % Schifahrt [alte Rechtschreibung...]
\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
 \keeplig{ffallokat}%Rohstoffallokation
\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{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{Riffeld} % Riffeldielen
 \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{ffelleck} % Waffelleckereien
 \keeplig{ffellinde}% Scheffellinde
 \keeplig{Muffell} % Muffellämmer
 \keeplig{muffell} % muffellig
 \keeplig{öffell}
  % Löffellamm Kochlöffellängen
 \keeplig{taffell} % Staffellauf -läufer
 \keeplig{toffell}
  % Kartoffellager -liebhaber
  % Pantoffellarve Kunstoffelle
 \keeplig{üffell} % Büffelleber -leder -leib
  % Trüffelleidenschaft Schnüffellust
\nolig{ffeile}{f|feile}
 % Prüffeile
\nolig{ffenster}{f|fenster}
 % Hinterhoffenster Schlaf- Tarif-
\nolig{fferien}{f|ferien}
 % Reiterhofferien Bauernhofferien
```

```
\nolig{ffernseh}{f|fernseh}          \nolig{fforder}{f|forder}
 % Abruffernsehen                     % Tarifforderung Strafforderung
\nolig{ffertig}{f|fertig}            \nolig{fförder}{f|förder}
 % schlaffertig                       % ruffördernd kreislauffördernd schlaffördernd
\nolig{ffestl}{f|festl}              \nolig{fforell}{f|forell}
 % Straffestlegung                    % Werfforellen
\nolig{ffests}{f|fests}              \nolig{fform}{f|form}
 % Straffestsetzung                    % Kopfform Gugelhupfform aufformen
 % Hoffestspiele Dorffestspiel       \nolig{fförm}{f|förm}
\nolig{ffetisch}{f|fetisch}           % reifförmig schweifförmig
 % Schaffetischisten                 \nolig{fforsch}{f|forsch}
\nolig{ffetus}{f|fetus}               % Schlafforschung Impfforschung
 % Schaffetus                        \nolig{fforen}{f|foren}
\nolig{ffett}{f|fett}                 % Abrufforen
 % Huffett Rumpffett Scharffetter    \nolig{fforu}{f|foru}
 \keeplig{Buffett} % Buffettheke      % Schlafforum
 \keeplig{Büffett}                   \nolig{ffoto}{f|foto}
 \keeplig{buffett}                    % Schlaffotogalerie
 \keeplig{büffett} % Obstbüffett     \nolig{fföt}{f|föt}
\nolig{ffetz}{f|fetz}                 % Wolffötus
 % Brieffetzen Stofffetzen
 \keeplig{Buffetz} % Buffetzeit      \nolig{ffracht}{f|fracht}
 \keeplig{Büffetz} % Büffetzusammenstellung   % Dampffrachter
\nolig{ffeud}{f|feud}                \nolig{ffrag}{f|frag}
 % Kasernenhoffeudalismus             % Streiffragen
\nolig{ffeue}{f|feue}                 \keeplig{Suffrage} % Suffragette
 % Dorffeuerwehr Torffeuer Lauffeuer  \keeplig{suffrage}
                                     \nolig{ffrak}{f|frak}
\nolig{ffilet}{f|filet}               % Rumpffraktion
 % Meerwolffilet                      \keeplig{toffrak} % Flüssigstoffrakete
\nolig{ffindung}{f|findung}          \nolig{ffrank}{f|frank}
 % Beruffindungsprozess               % Fünffrankenstück
\nolig{ffirm}{f|firm}                \nolig{ffräs}{f|fräs}
 % Brieffirmen Tariffirmen            % Baumstumpffräse
 \keeplig{affirm}                    \nolig{ffrau}{f|frau}
 \keeplig{Affirm}                     % Hoffrau Kauffrau
                                      \keeplig{ffraum} % Sprengstoffraub
\nolig{ffolg}{f|folg}                 \keeplig{ffraub} % Treffraum
 % Impffolgen                         \keeplig{ffrausch} % Klebstoffrausch
\nolig{ffoli}{f|foli}                 \keeplig{ffraup} % Stoffraupe
 % Relieffolien
\nolig{ffolter}{f|folter}            \nolig{ffreak}{f|freak}
 % Tropffolter                        % Surffreak
 \keeplig{Affoltern} % town near Zurich  \keeplig{toffreak} % Schadstoffreaktionen
\nolig{ffond}{f|fond}                \nolig{ffregat}{f|fregat}
 % Tariffondslösung                   % Kampffregatte Dampffregatte
```

```
\nolig{ffrei}{f|frei}
 % tariffrei Schlaffrei
 \keeplig{chiffrei}% Schiffreise
 \keeplig{toffrei} % stoffrein sauerstoffreich
 \keeplig{uffreis} % Puffreis
 \keeplig{luffrei} % schluffreich
 \keeplig{iffreig} % Riffreigen
\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 Hoffrieden
\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}
 % Kampffführung 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{offegen}{of|fegen}
 % Hoffegen

\nolig{pffach}{pf|fach}
 % Strumpffach
\nolig{pffern}{pf|fern}
 % rumpffern
\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}                    \keeplig{Chefin} % Chefin Chefinnen
 % reiffern                                     \nolig{Chefin[a-mo-z]}{Chef|in}
\nolig{rffan}{rf|fan}                           % Chefinder -indianer -inspektor
 % Surffan                                      % -inquisitor
\nolig{rffeel}{rf|feel}                        \keeplig{chefin}
 % Surffeeling                                   \nolig{chefind}{chef|ind}
\nolig{rffest}{rf|fest}                        \keeplig{chefibel} % Recherchefibel
 % Surffest                                     \keeplig{chefiebe} % Recherchefieber
\nolig{rffinn}{rf|finn}                        \keeplig{chefigur} % Nietzschefigur
 % Surffinne                                    \keeplig{chefilm} % Rachefilm
\nolig{rffleck}{rf|fleck}                      \keeplig{chefili} % Wäschefiliale
 % Schorfflecken                                \keeplig{chefirm} % Geldwäschefirma
                                               \keeplig{chefisch} % Wäschefische
\nolig{straffern}{straf|fern}
 \keeplig{rtstraffern} % Gurtstraffern         \nolig{Dorfi}{Dorf|i}
 \keeplig{ssstraffern}                         \nolig{dorfi}{dorf|i}
  % Gurtschlossstraffern                        % Dorfidylle -information -institute
                                               \nolig{Hofi}{Hof|i}
\nolig{ünff}{ünf|f}                             % (viele Fälle!)
 % fünffarbig fünffingrig fünfflügelig          \keeplig{Hofier} % Hofieren
 % Fünfflach fünfflammig fünffleckige          \nolig{Kampfi}{Kampf|i}
                                               \nolig{kampfi}{kampf|i}
\nolig{wurff[aäeiloöruü]}{wurf|f}               % Kampfideologie Kampfinstrument
 % Auswurffach Einwurffehler                   \nolig{Kaufi}{Kauf|i}
 % Hammerwurffinale                            \nolig{kaufi}{kauf|i}
                                                % Kaufidee kaufinteressiert Kaufimpuls
                                               \nolig{Laufi}{Lauf|i}
% 2. fi -> f-i                                 \nolig{laufi}{lauf|i}
% ------------                                   % Laufidol Kreislaufinsuffizienz
                                                \keeplig{Laufig}
\nolig{Aufi}{Auf|i}                             \keeplig{Blaufi}
\nolig{aufinstr}{auf|instr}                      % Blaufichte Blaufilter Blaufisch
 % aufinstruieren                               \keeplig{laufilter} % Planetenblaufilter
\nolig{aufirr}{auf|irr}                         \keeplig{laufiedr} % blaufiedrig
 % hinaufirrte                                 \nolig{rüfi}{rüf|i}
\nolig{aufisst}{auf|isst}                        % Prüfinhalt Prüfinstitution Prüfintervall
                                               \nolig{Rumpfi}{Rumpf|i}
\nolig{Briefi}{Brief|i}                        \nolig{rumpfi}{rumpf|i}
\nolig{briefi}{brief|i}                          % Rumpfitalien Strumpfindustrie
 % Briefidiom Briefinhalt Pfandbriefinhaber     \keeplig{rumpfig}

\nolig{Chefi}{Chef|i}                          \nolig{chafi}{chaf|i} % Schaf-i...
\nolig{chefi}{chef|i}                            % Schafimperium Schafinnereien
 % Chefideologe Chefindianer                    \keeplig{schafigu} % Maharadschafigur
 % Chefinformatiker                            \nolig{chlafi}{chlaf|i} % Schlaf-i-...
                                                % Schlafiglu schlafinduzierend
```

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```
 \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} % Paraffinhaltig
\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}          % eingriffintensiv
 % Schlafinnenräumen               \nolig{finter}{f|inter}
\nolig{finnens}{f|innens}           % Feuerschiffinteressierte
 % Rumpfinnenseite                  % Begriffinterpretationen
                                    % Strafinterventionen Rufintervalle
\nolig{finner}{f|inner}            \nolig{finton}{f|inton}
 % tiefinnerlich Kopfinneres         % Tiefintonieren
\nolig{finnig}{f|innig}            \nolig{fintrig}{f|intrig}
 % tiefinnige                        % Briefintrige Hofintrige
\nolig{finnov}{f|innov}            \nolig{finvent}{f|invent}
 % Tarifinnovationen                 % Laufinventar
\nolig{finsass}{f|insass}          \nolig{finvest}{f|invest}
 % Raumschiffinsassen                % Anlaufinvestitition
\nolig{finsekt}{f|insekt}
 % Laufinsekt                       \nolig{firis}{f|iris}
\nolig{finsel}{f|insel}             % Sumpfiris
 % Schafinsel Schilfinsel Saufinsel \nolig{fironi}{f|ironi}
\nolig{finserat}{f|inserat}         % tiefironisch
 % Titelkopfinserat                 \nolig{firre}{f|irre}
\nolig{finsign}{f|insign}           % Dorfirre
 % Knopfinsignien                   \nolig{firru}{f|irru}
\nolig{finspek}{f|inspek}           % Werfirrung
 % Kirchhofinspektor
\nolig{finsta}{f|insta}            \nolig{fisolat}{f|isolat}
 % Kunstriffinstallateur            % Strafisolator Schaumstoffisolation
 % Schiffinstandsetzung            \nolig{fisolie}{f|isolie}
 % Strafinstanz rumpfinstabil        % Griffisolierung
\nolig{finstinkt}{f|instinkt}
 % Zupfinstinkt                     \nolig{uffax}{uf|fax}
\nolig{finstitu}{f|institu}         % Notruffax Abruffax
 % Strafinstitutionen
\nolig{finstrukt[io]}{f|instrukt}
 % Wurfinstruktion Chefinstruktor
\nolig{finstrum}{f|instrum}        % 3. fl -> f-l
 % Zupfinstrumente Schleif- Greif-  % ------------
\nolig{finsuff}{f|insuff}
 % Kreislaufinsuffizienz           \nolig{Aufl[aeiouyäöü]}{Auf|l}
\nolig{finszen}{f|inszen}           % Must avoid catching "Aufl.".
 % Kopfinszenierung                \nolig{aufl}{auf|l}
\nolig{fintars}{f|intars}           % Hundreds (thousands?!) of words
 % Griffintarsien                   % However, must allow for quite a few
\nolig{fintell}{f|intell}           % exceptions:
 % Hofintellektueller              \keeplig{auflair} % Tierschauflair
\nolig{fintegr}{f|integr}          \keeplig{aufläche}% Anbau- Grau- Kau- ...
 % Tarifintegration                  % Niveau- Plateau- Schau- Staufläche
\nolig{fintens}{f|intens}          \keeplig{aufliegl}% Tauflieglein
```

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```
\keeplig{auflüssig} % Tauflüssigkeit
\keeplig{baufl}
 % Modellbauflieger Weinbauflecken
\keeplig{Baufl} % Bauflaute
 \nolig{bauflösen}{bauf|lösen}
   % grobauflösend
\keeplig{blaufl}% blaufleckig blauflauschig
 \nolig{blaufloch}{blauf|loch}
    % Ablaufloch
 \nolig{blauflog}{blauf|log}
    % Ablauflogik
\keeplig{Blaufl}% Blauflügel (Libelle)
\keeplig{fraufl}% Frauflüge
\keeplig{Fraufl}
\keeplig{gauflöte} % Rheingauflöte
\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{Dampfl}{Dampf|l}
\nolig{dampfl}{dampf|l}
```

```
 % Dampflanze Natriumdampflampe
\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
 \keeplig{thanflamm} % Methanflamme
\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{impfla}{impf|la}
 % Schimpflaute
 \keeplig{eimpflanz} % Keimpflanze
\nolig{impfle}{impf|le}
 % Impflegende
 \keeplig{eimpfleg} % Heimpfleger
 \keeplig{timpfleg} % Intimpflege
\nolig{Kampfl}{Kampf|l}
\nolig{kampfl}{kampf|l}
 % Kampflegende kampflüstern
 % Wahlkampflüge
\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{Reliefl}{Relief|l}
\nolig{reliefl}{relief|l}
 % Relieflandschaft -lagen -landkarte
 % relieflos
\nolig{Rufl}{Ruf|l}
\nolig{rufl}{ruf|l}
 % viele Fälle, aber...
 \keeplig{Durufl}   % Duruflé
 \keeplig{mbarufl}  % Gambarufluss
 \keeplig{ruflagge} % Peruflagge
 \keeplig{rufleisch} % Kängurufleisch

\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{Schrumpfl}{Schrumpf|l}
\nolig{schrumpfl}{schrumpf|l}
 % Schrumpflack

\nolig{Schweifl}{Schweif|l}
\nolig{schweifl}{schweif|l}
 % Schweiflecken
\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{Strumpfl}{Strumpf|l}
\nolig{strumpfl}{strumpf|l}
 % Strumpfladen Strumpfloch
\nolig{Sumpfl}{Sumpf|l}
 % Sumpflabkraut -leiche -licht

\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{Tiefl}{Tief|l}
\nolig{tiefl}{tief|l}
 % Tieflager stieflich
 \keeplig{tiefläche} % Garantieflächen
 \keeplig{atieflaute}% Demokratieflaute
 \keeplig{atieflut} % Bürokratieflut

\nolig{Topfl}{Topf|l}
\nolig{topfl}{topf|l}
 % Topflappen Topflumpen
 \keeplig{Topflagg}  % Topflaggen
 \keeplig{Topflitz}  % Topflitzer
 \keeplig{Topflor}   % Topflor
 \keeplig{rtopfli}   % portopflichtig
 \keeplig{topfläch}  % Biotopfläche
 \keeplig{topfleg}   % Autopflege
  \nolig{rtopfleg}{rtopf|leg}
    % Schmortopflegen
 \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} % Auswärtsorfluch
\keeplig{torflug}  % Simulatorflug
\keeplig{torflüg}  % Motorflüge
\keeplig{torflüss} % Indikatorflüssigkeit
\keeplig{torfluss}
\keeplig{torfluß}  % Motorflußschiff


\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{äufle}{äuf|le}
 % Häuflein träufle
```

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

\nolig{flaberer}{f|laberer}
 % Dumpflaberer
\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{flaminat}{f|laminat}
 % Rumpflaminat
\nolig{flamp}{f|lamp}
 % Kompaktleuchtstofflampe Notruflampe
\nolig{fland}{f|land}
 % Hofland Kauf- Sumpf- Tief-
 % Straflandesgericht Dorflandwirtschaft
 % Iffland Rifflandschaft
 % Altelfland Delfland
 \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
 \keeplig{nflehn} % anflehn dahinflehn
   % Seelenflehn (Faust I)
 \keeplig{rflehn} % erflehn Schwesterflehn
 \keeplig{Hoflehn} % Hof[f]flehner (arch.)
\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 Höfler
 \keeplig{Hoefler} % famous American font designer
\nolig{fleut}{f|leut}
 % Hofleute Kaufleute

\nolig{flich}{f|lich}
 % tariflich reiflich glimpflich ...
 % (many words!)
 %% Vorsicht aber mit Pflicht und pflicht,
 %% sowie mit einflicht, verflicht, etc.:
 \keeplig{flicht}
  \nolig{öpflicht}{öpf|licht}
   % kröpflicht (??)

\nolig{flieb}{f|lieb}
```

```
 % freiberufliebend riffliebend
\nolig{flief}{f|lief}
 % schieflief Hoflieferant
\nolig{flig}{f|lig}
 % schweflig würflig knifflig mufflig
 % zweigipflig fünfzipflig
\nolig{flila}{f|lila}
 % tieflila stumpflila
\nolig{flinde}{f|linde}
 % Dorflinde Wolflinde Ziegelhoflinde
 % krampflindernd
\nolig{fling}{f|ling}
 % Prüfling Fünfling Sträfling Täufling
 \keeplig{Bempfling} % Bempflingen
\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
 \keeplig{ntflohn} % entflohn (Faust I)
\nolig{flöhn}{f|löhn}
 % Tariflöhne
\nolig{flok}{f|lok}
 % Dampflokomotive dampflokartig
 % Dorflokal Trefflokal
\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}
\nolig{gipfle}{gipf|le}
 % gipfle

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

\nolig{lflady}{lf|lady}
 % Golflady
\nolig{lflast}{lf|last}
 % Wolflast

\nolig{lflos}{lf|los}
 % hilflos
 \keeplig{lfloss}
 % Walflosse Kiel- Paddel-
 \keeplig{lflosk}
 % Moralfloskel Sozial- Spiel-
\nolig{lürfl}{lürf|l}
 % Schlürflaut

\nolig{nflehm}{nf|lehm}
 % Hanflehm

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

\nolig{opfla}{opf|la}
 % Topflappen Kopflaus kopflastig
```

```
 \keeplig{gopflaum} % Mangopflaumen
 \keeplig{iopflast} % Biopflaster
 \keeplig{nopflaster}% Kinopflaster
 \keeplig{opflair}  % Popflair
 \keeplig{opflanz}  % Kakaopflanzen
\nolig{öpfle}{öpf|le}
 % köpfle tröpfle Knöpfle
\nolig{orflad}{orf|lad}
 % Dorfladen

\nolig{pflaut}{pf|laut}
 % Kehlkopflaut
\nolig{pfleier}{pf|leier}
 % Zupfleier
\nolig{pflehm}{pf|lehm}
 % Stampflehm
\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{pflos}{pf|los}
 % kampflos kopflos
 \keeplig{pfloss} % Pappflossen
\nolig{pflös}{pf|lös}
 % krampflösend Hüftkopflösung
\nolig{pflup}{pf|lup}
 % Kopflupe
\nolig{pflux}{pf|lux}
 % Hüftkopfluxation

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

\nolig{reifl}{reif|l}
 % Greiflippe Stegreiflieder Streiflacher
 \keeplig{Breifl}
```

```
\keeplig{breifl}                                    \nolig{affind}{af|find}
\keeplig{Dreifl}                                     % Straffindung
\keeplig{dreifl}                                     \keeplig{araffind} % Paraffinduft
\keeplig{Freifl}
\keeplig{freifl}                                    \nolig{ffibel}{f|fibel}
\keeplig{eiereifl} % Meiereiflügel                   % Zwiebelknopffibeln
\keeplig{reifläch} % Freiflächen                    \nolig{ffieb}{f|fieb}
\keeplig{reiflagg} % Reedereiflagge                  % Sumpffieber Wahlkampffieber
\keeplig{reiflamm} % dreiflammig                    \nolig{ffigu}{f|figu}
\keeplig{reiflasch}% Milchbreiflaschen               % Streiffigur
\keeplig{reiflies} % Fleischereifliesen             \nolig{ffilm}{f|film}
\keeplig{reiflock} % Breiflocken                     % Werwolffilm
\keeplig{reifloh} % Büchereiflohmarkt               \nolig{ffilter}{f|filter}
\keeplig{reiflöhe} % Gießereiflöhe                   % Tropffilter Topffilter
\keeplig{reiflott} % Fischereiflotte                \nolig{ffinal}{f|final}
                                                     % Hammerwurffinale
\nolig{Tafle}{Taf|le}                               \nolig{ffinte}{f|finte}
\nolig{tafle}{taf|le}                                % Sprungwurffinte
 % tafle                                             \keeplig{raffinte} % Paraffintest
 \keeplig{tafleck} % Zahnpastaflecken               \nolig{ffinanz}{f|finanz}
 \keeplig{taflege} % Regattaflegel                   % Hoffinanz Kauffinanzierung
                                                    \nolig{ffistel}{f|fistel}
\nolig{urflad}{urf|lad}                              % Kropffistel
 % Surfladen                                        \nolig{ffixier}{f|fixier}
\nolig{urfloch}{urf|loch}                            % Dampffixiergerät
 % Balleinwurfloch
                                                    \nolig{hoffing}{hof|fing}
\nolig{wafle}{waf|le}                                % Bischoffinger
 % schwafle
\nolig{wefle}{wef|le}                               \nolig{iffind}{if|find}
 % schwefle                                          % Tariffindung
\nolig{weifle}{weif|le}
 % bezweifle verzweifle                             \nolig{lffing}{lf|fing}
 \keeplig{weifleck}  % zweifleckig                   % Zwölffingerdarm
\nolig{werfl}{werf|l}                               \nolig{lffisch}{lf|fisch}
 % Wegwerflied                                       % Wolffisch
 \keeplig{chwerfl}
 % Schwerflugzeug schwerfließend                    \nolig{nffing}{nf|fing}
 \keeplig{werflitz} % Powerflitzer                   % fünffingrig Fünffingergebirge

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

% 4. ffi -> f-fi                                    \nolig{reiffing}{reif|fing}
% --------------                                     % Greiffinger
```

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

\nolig{Stoffi}{Stoff|i}
\nolig{stoffi}{stoff|i}
 % Rohstoffindustrieller -importe
 % Baustoffingenieur Kunststoffingenieur
 % Kohlenstoffisotope
 \keeplig{stoffiz}
 % Geheimdienstoffiziere
 \keeplig{stoffig}
 % permit ffi ligature for ff-ig suffix

\nolig{ffinnen}{ff|innen}
 % Schiffinnenraum Schiffinnenausbau


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

\nolig{Griffl}{Griff|l}
\nolig{griffl}{griff|l}
 % Grifflängen -laschen -leiste
 % grifflos angrifflustig
\nolig{Offline}{Off|line}
\nolig{offline}{off|line}
 % offline, Offline
\nolig{Pfiffl}{Pfiff|l}
 % Pfifflaute
\nolig{Scheffle}{Scheff|le}
\nolig{scheffle}{scheff|le}
 % Scheffler Geldscheffler
\nolig{Schiffl}{Schiff|l}
\nolig{schiffl}{schiff|l}
 % Schifflache Schiffladung Schifflinie
\nolig{Stoffl}{Stoff|l}
\nolig{stoffl}{stoff|l}
 % lots of words...

\nolig{afflu}{aff|lu}
 % Gafflust

\nolig{fflamell}{ff|lamell}
```

```
 % Rafflamellen
\nolig{fflast}{ff|last}
 % Rohstofflastigkeit Treibstofflaster
\nolig{fflatsch}{ff|latsch}
 % Rifflatschern
\nolig{ffloch}{ff|loch}
 % Suffloch Griffloch Sauerstoffloch
\nolig{fflos}{ff|los}
 % auspufflos

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

\nolig{offlad}{off|lad}
 % Sprengstoffladung
\nolig{öffle}{öff|le}
 % löffle
\nolig{offlo}{off|lo}
 % wirkstofflos Sauerstoffloch
 % offload

\nolig{pufflack}{puff|lack}
 % Auspufflack

\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{Auffl}{Auf|fl}
\nolig{auffl}{auf|fl}
 % aufflackern aufflammen Aufflickung
```

```
    % Auffliegen

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

\nolig{ffläch}{f|fläch}
 % Lauffläche Kampfflächen
 % Zwölfflächner zwölfflächig
\nolig{fflech}{f|flech}
 % aufflechten
\nolig{ffleisch}{f|fleisch}
 % Schaffleisch Kopffleisch
\nolig{fflexib}{f|flexib}
 % Tarifflexibilitat
\nolig{fflies}{f|flies}
 % Relieffliesen
\nolig{fflimm}{f|flimm}
 % Vorhofflimmern
\nolig{ffluch}{f|fluch}
 % Tarifflucht Werwolffluch
\nolig{fflüch}{f|flüch}
 % Tarifflüchtling
\nolig{fflug}{f|flug}
 % Tiefflug Kampfflugzeug Chefflugleiter
\nolig{fflüg}{f|flüg}
 % Streifflüge zwölfflügelig Tiefflüge
\nolig{fflur}{f|flur}
   % Klosterhofflur
\nolig{ffluss}{f|flus}
   % Prüffluss
\nolig{fflüs}{f|flüs}
 % Schleifflüsigkeit}
\nolig{fflut}{f|flut}
 % Brieffluten Rückrufflut Anrufflut

\nolig{iefflieg}{ief|flieg}
 % tieffliegend
\nolig{iefflog}{ief|flog}
 % tiefflog

\nolig{lfflach}{lf|flach}
 % Zwölfflach

\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




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

\if@noftligs
\else % suppress them selectively...
 \nolig{Auft[aähioöruüy]}{Auf|t}
 \nolig{auft[aähioöruüy]}{auf|t}
  % (viele viele Fälle; aber: ft-Ligatur wird
  % doch verwendet für "Auft.")

\nolig{Brieft}{Brief|t}
\nolig{brieft}{brief|t}
 % Brieftasche Brieftaube
\nolig{Cheft}{Chef|t}
\nolig{cheft[a-z]}{chef|t}
 % Cheftheoretiker Cheftrainer
 \keeplig{omicheft[ceg]}
\nolig{Dorft}{Dorf|t}
\nolig{dorft}{dorf|t}
 % Dorftrottel -tratsch -tümpel
\nolig{Elfte}{Elf|te}
\nolig{elfte}{elf|te}
 % elfte elftens
 \keeplig{elfterfolg} % elfterfolgreichste

\nolig{Fünft[aäeoöruy]}{Fünf|t} % Fünftagewoche ...
\nolig{fünft[aäeoöruy]}{fünf|t} % fünftens...
 \keeplig{fünfterfolg} % fünfterfolgreichste
 \keeplig{Fünfterfolg}
 \keeplig{fünftrang}  % fünftrangig
```

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```
\keeplig{Fünftrang}
\keeplig{fünftreich} % fünftreichste
\keeplig{Fünftreich}
\keeplig{Fünftoper}  % Fünftoperation
\keeplig{Fünftrund}  % Fünftrunden
\keeplig{Fünftäon}
\keeplig{fünftältest}
\keeplig{Fünftältest}

\nolig{Golft}{Golf|t}
\nolig{golft[hiruüy]}{golf|t}
 % Golfträume -turnier -typ -talent

\nolig{Greift[eio]}{Greif|t}
 % Greiftest -tentakeln -tier -tor
\nolig{Hanft}{Hanf|t}
 % Hanftaler Hanftau
\nolig{Hoft[aäehioäruüy]}{Hof|t}
\nolig{hoft[aähioöruü]}{hof|t}
 % Hoftor Klosterhoftor

\nolig{Laufte}{Lauf|te}
 % Lauftermin Lauftest Lauftext
\nolig{Prüft[aähioäruüy]}{Prüf|t}
\nolig{prüft[aähioöruü]}{prüf|t}
 % Prüftheorie
\nolig{Ruft[aäehioäruüy]}{Ruf|t}
 % Ruftaxi Rufterz Rufton Ruftöne

\nolig{Schaftal}{Schaf|tal}
\nolig{Schaftor}{Schaf|tor}
\nolig{Schaftreib}{Schaf|treib}

\nolig{Schlaft}{Schlaf|t}
\nolig{schlaft[aähioäruüy]}{schlaf|t}
 % Schlaftablette
\nolig{Schilft[äehiruüy]}{Schilf|t}
\nolig{schilft[hiruüy]}{schilf|t}
 % Schilfteich Schlilftümpel
\nolig{Senft[aäehioäruy]}{Senf|t}
 % Senftube
 \keeplig{Senftenberg}
\nolig{Straft[aähioöruüy]}{Straf|t}
\nolig{straft[aähioöruüy]}{straf|t}
 % (viele Fälle)
 \keeplig{straftheit} % Unbestraftheit
```

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

%% Words that start with a capital letter
%%  and end in f-test
\nolig{Abstreiftest}{Abstreif|test}
\nolig{Ankauftest}{Ankauf|test}
\nolig{Hörprüftest}{Hörprüf|test}
\nolig{Hüpftest}{Hüpf|test}
\nolig{Impftest}{Impf|test}
\nolig{Kauftest}{Kauf|test}
\nolig{Klopftest}{Klopf|test}
\nolig{Kneiftest}{Kneif|test}
\nolig{Lichtschweiftest}{Lichtschweif|test}
\nolig{Rückruftest}{Rückruf|test}
\nolig{Schnupftest}{Schnupf|test}
\nolig{Sumpftest}{Sumpf|test}
\nolig{Tropftest}{Tropf|test}
\nolig{Wettkampftest}{Wettkampf|test}
\nolig{tofftest}{toff|test}
 % Impfstofftest Treibstofftests

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

\nolig{auftee}{auf|tee}
 % Kreislauftee
\nolig{lauftest}{lauf|test}
 % Kreislauftest

\nolig{eiftie}{eif|tie}
 % Greiftiefe Steiftier
\nolig{eiftit}{eif|tit}
 % Eingreiftitel
\nolig{eiftr}{eif|tr}
 % Eingreiftruppe Nadelstreifträger
 % Greiftrupp -tier -training
\nolig{elieft}{elief|t}
 % Relieftäfelchen -tropfen -türme
\nolig{enftei}{enf|tei}
 % Senfteig

\nolig{ftabell}{f|tabell}
 % Ruftabelle
\nolig{ftablett}{f|tablett}
 % Schlaftabletten
\nolig{ftafel}{f|tafel}
 % Pfeiftafel
\nolig{ftag}{f|tag}
 % Tauftag Fünftagewoche
 \keeplig{ftagent} % Luftagentur
\nolig{ftäg}{f|täg}
 % fünftägig elfftägig zwölftägig
\nolig{ftalsg}{f|talsg}
 % schaftalsgrundig
\nolig{ftanz}{f|tanz}
 % Kampftanz Schilftanz
 \keeplig{ftanzahl} % Heftanzahl
 \keeplig{ftanzeig} % Luftanzeige
 \keeplig{ftanzieh} % Schwerkraftanziehung
 \keeplig{ftanzüg} % Haftanzüge
\nolig{ftänz}{f|tänz}
 % Tieftänzer
\nolig{ftari}{f|tari}
 % Anruftarif
 \keeplig{ftaristokr} % Zunftaristokratie
\nolig{ftarn}{f|tarn}
 % Wegwerftarnungen
\nolig{ftasse}{f|tasse}
 % Schürftasse
 \keeplig{ftassel} % Gruftasseln

\nolig{ftatb}{f|tatb}
 % Straftatbestände
\nolig{ftaten}{f|taten}
 % Kampftaten Straftaten
\nolig{ftätig}{f|tätig}
 % Schürftätigkeit
\nolig{ftauch}{f|tauch}
 % Beruftaucher Kreislauftauchgerät
\nolig{ftaugl}{f|taugl}
 % prüftauglich
\nolig{ftaume}{f|taume}
 % Nachruftaumel
\nolig{ftax}{f|tax}
 % Ruftaxi

\nolig{fteam}{f|team}
 % Jugendtreffteam Impfteam
 \keeplig{fteamt} % Streitkräfteamt
\nolig{ftechn}{f|techn}
 % Stampftechnik schlaftechnisch
 % Kraftstofftechnologie Pfeiftechnik
\nolig{ftedd}{f|tedd}
 % Schlafteddy
\nolig{fteich}{f|teich}
 % Schilfteich Dorfteich
 \keeplig{nfteich} % Zunfteiche
 \keeplig{ifteich} % Schrifteiche
\nolig{fteigw}{f|teigw}
 % Dampfteigwaren
\nolig{fteil}{f|teil}
 % fünfteilig Friedhofteil
 % Raumschiffteil Riffteil Stoffteil
\nolig{ftelef}{f|telef}
\nolig{fteleph}{f|teleph} % old spelling...
 % Wegwerftelefon Notruftelefonnummern
\nolig{fteller}{f|teller}
 % Schiefteller
\nolig{ftempel}{f|tempel}
 % Kauftempel
\nolig{ftemper}{f|temper}
 % Schlaftemperatur
\nolig{ftempo}{f|tempo}
 % Dauerlauftempo
\nolig{ftendenz}{f|tendenz}
 % Klassenkampftendenz
\nolig{ftentak}{f|tentak}

% Greiftentakeln
\nolig{fteppi}{f|teppi}
 % Schaumstoffteppich Knüpfteppich
\nolig{ftermin}{f|termin}
 % Anpfifftermin Passagierschiffterminal
 \keeplig{fterminder}
  % Gesellschafterminderheiten
\nolig{ftermit}{f|termit}
 % Kampftermiten
 \keeplig{ftermitt} % Rauschgiftermittler
\nolig{fterrain}{f|terrain}
 % Kampfterrain
\nolig{fterrass}{f|terrass}
 % Tuffterrassen
\nolig{fterrin}{f|terrin}
 % Kohlkopfterrine
\nolig{fterror}{f|terror}
 % Schadstoffterror
\nolig{ftestat}{f|testat}
 % Prüftestate
 \keeplig{ftestation}
  % Streitkräftestationierung
 \keeplig{ftestatist}
  % Lehrkräftestatistik
\nolig{fteuf}{f|teuf}
 % Dorfteufel Saufteufel
\nolig{ftext}{f|text}
 % Betrefftext Stofftextur Stegreiftexte
 \keeplig{ftextrakt} % Duftextrakt

\nolig{ftheat}{f|theat}
 % Stegreiftheater
\nolig{fthem}{f|them}
 % Wolfthema
 \keeplig{fthemm} % Wirtschafthemmnis
\nolig{ftheor}{f|theor}
 % -f-theorie -f-theorien
\nolig{ftherap}{f|therap}
 % Impftherapie Wurftherapie
 % Schröpftherapeut
\nolig{ftick}{f|tick}
 % Rückruftickets Diskuswurfticket
\nolig{ftief}{f|tief}
 % tieftief (?)
 \keeplig{ftiefigur} % Softiefigur
\nolig{ftier}{f|tier}

% Wegwerftier Huftier
 \keeplig{haftier} % inhaftieren
 \keeplig{Muftier} % Muftierben
\nolig{ftipp}{f|tipp}
 % Surftipp
\nolig{ftirad}{f|tirad}
 % Schimpftirade
\nolig{ftisch}{f|tisch}
 % Schleiftisch
 \keeplig{stiftisch} % hochstiftisch
 \keeplig{ünftisch} % zünftisch

\nolig{ftod}{f|tod}
 % Hanftod
 \keeplig{ftodem} % Giftodem
\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{ftöpf}{f|töpf}
 % Senftöpfchen Torftöpfchen
 % Kunststofftöpfe
\nolig{ftorig}{f|torig}
 % schaftorig fünftorig
\nolig{ftour}{f|tour}
 % Streiftour

\nolig{ftrader}{f|trader}
 % Cheftrader
\nolig{ftradition}{f|tradition}
 % Ruftraditionen
\nolig{fträg}{f|träg}
 % Notrufträger
\nolig{ftrain}{f|train}
 % Lauftrainer
\nolig{ftränk}{f|tränk}
 % Rückruftränke Schaftränke
\nolig{ftransp}{f|transp}
 % Hilftransport Schaftransport
\nolig{fträume}{f|träume}

% tiefträumend Tiefschlafträume
 \keeplig{afträume} % Einzelhafträumen
 \keeplig{äfträume} % Geschäfträumen
 \keeplig{rifträume}% Schrifträume
 \keeplig{ufträume} % Lufträumen
\nolig{ftrauri}{f|traurig}
 % tieftraurig
\nolig{ftreff}{f|treff}
 % Notruftreffen
\nolig{ftresor}{f|tresor}
 % Tieftresor
 \keeplig{ftresorp} % Luftresorption
\nolig{ftret}{f|tret}
 % Mieftreter
 \keeplig{ftrett} % Luftrettungsdienst
 \keeplig{ftreturn}% Softreturn
\nolig{ftrick}{f|trick}
 % Rückruftricks
\nolig{ftrieb}{f|trieb}
 % auftriebte schaftriebig
\nolig{ftrief}{f|trief}
 % tieftriefend
\nolig{ftrift}{f|trift}
 % schaftriftig Schaftrift
\nolig{ftrimest}{f|trimest}
 % fünftrimestrig zwölftrimestrig
\nolig{ftritt}{f|tritt}
 % Huftritte
 \keeplig{ftritter} % Kernkraftritter
 \keeplig{Luftritt}
\nolig{ftrott}{f|trott}
 % Sauftrottel

\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{graftum}{graf|tum}
 % Burggraftum Markgraftum
\nolig{graftüm}{graf|tüm}
 % Markgraftümer

\nolig{hoftest}{hof|test}
 % Schlachthoftest

\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{lfto}{lf|to}
 % Zwölftonmusik Elftonner Golftour
\nolig{lftö}{lf|tö}
 % zwölftönend
\nolig{lftum}{lf|tum}
 % Werwolftum

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

\nolig{ölfte}{ölf|te}

```
% zwölfte zwölftens

\nolig{pft[aähioöruüy]}{pf|t}
 % Wettkampftag -trubel -tauglich -töne
 % Kampftaktik -truppe -tätigkeit -tänzer
 % Schnupftabak -tuch -tücher -tüchlein
 % Schimpftiraden Mehrkampftitel
 % Stapftiefe Zopfträger
 % Dampftopf Sumpftour Herzklopftöne
 % Kopftreffer -tuch -tücher
 % Impftabelle -tarif -tierarzt -tod
 \keeplig{pftheit}
 % Gedämpftheit Umkämpftheit
\nolig{pftee}{pf|tee}
 % Schlumpftee (?!)
\nolig{pfteig}{pf|teig}
 % Sumpfteig Hefetropfteig
\nolig{pftender}{pf|tender}
 % Heißdampftenderlok

%\nolig{rftrag}{rf|trag}
 % Wegwerftragtasche Dorftragödie

\nolig{rftr}{rf|tr}
 % Wurftraining Surftrip Freiwurftreffer
 \keeplig{tdurftrö} % Notdurftröhre
 \keeplig{Werftr}  % Werftreparatur
 \keeplig{werftr}
  \nolig{werftrage}{werf|trage}
  % Wegwerftragetasche
\nolig{rftu}{rf|tu}
 % Wurftuch
 \keeplig{Werftu}
 \keeplig{werftu}
  % Werftumfeld Werftunternehmen

\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{urfta}{urf|ta}
 % Wurftalent Auswurftaste Surftalent
 \keeplig{tdurfta} % Notdurftanlage
\nolig{urfto}{urf|to}
 % Freiwurftor Surftour

\nolig{ünftor}{ünf|tor}
 % fünftorig Fünftore-Vorsprung

\fi % end of \if@noftligs condition


% 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:
 \keeplig{Kafka}
 \keeplig{kafka}
 \keeplig{Piefke}
 \keeplig{piefkei} % Ostpiefkei
 \keeplig{Safka}
 \keeplig{Potrafke}
 \keeplig{Sprafke}
 \keeplig{Shirafkan}
 \keeplig{Tirafkan}
 \keeplig{Selfkant}


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

% Suppress this ligature globally. Words
% of German origin seem to feature 'fj'
% only 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}
\keeplig{fjöll}
```

```
\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
%      Schlifffläche Kunststoffflügel
```

C   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{0.260}
\def\selnoligpackagedate{2013/09/21}

% Announce who we are.

\typeout{=== Package \selnoligpackagename,
      Version \selnoligpackageversion,
      Date  \selnoligpackagedate\space ===}
\ProvidesPackage{selnolig}[\selnoligpackagedate]



% Issue warning message if not running under LuaLaTeX.

\RequirePackage{ifluatex}
\ifluatex
 \RequirePackage{luatexbase}
\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{ *can not* be performed.         }
 \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
   =======================================}
 }
\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 augment the "basic" setting:
% - broadf  More non-ligation rules for f-ligatures
% - 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 'basic' option automatically sets the preceding
% Booleans to 'false'.

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


% 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 option 'noftligs' serves to suppress ft and fft
% ligatures *globally*. Default value: 'false'.
```

```
\newif\if@noftligs\@noftligsfalse
\DeclareOption{noftligs}{\@noftligstrue}


% The option 'zwnj' (synonym: ZWNJ) directs selnolig
% to use the unicode character x200C (aka ZERO WIDTH
% NO JOiNER) as the item to break up ligatures.

\newif\if@zwnj\@zwnjfalse
\DeclareOption{zwnj}{\@zwnjtrue}
\DeclareOption{ZWNJ}{\@zwnjtrue}


% Finally, an option to set most language-related
% Boolean variables (other than '@addlhyph') to
% 'true' simultaneously.

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

% Finally, process all options
\ProcessOptions\relax


\if@noftligs % suppress ft and fft ligatures globally
 \AtBeginDocument{ \nolig{ft}{f|t} }
\fi

\if@zwnj%
 \directlua{ zwnj=true }
\fi



% 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


% Recording operations of selnolig package to the log
% file is enabled via the '\debugon' command.
% Note: the default value of 'debug' (set in
%   'selnolig.lua') is 'false'. To turn off logging
% of selnolig's activity, use the command \debugoff.
\newcommand\debugon{%
  \directlua{ debug=true }
}
\newcommand\debugoff{%
  \directlua{ debug=false }
}


% The first 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 by \nolig instructions:
\newcommand\keeplig[1]{
  \directlua{
    always_keep_liga( "\luatexluaescapestring{#1}" )
  }
}

% A third user macro turns ligature suppression off
% temporarily:
\newcommand\uselig[1]{%
 \directlua{ enable_suppression(false) }%
 \mbox{#1}%
 \directlua{ enable_suppression(true) }%
}
```

```
% A fourth user macro: '\breaklig'. This is
% hopefully easier to remember than having to
% type "\-\hspace{0pt}". If the zwnj option is
% enabled, insert a ZWNJ character instead.

\if@zwnj
 \newcommand{\breaklig}{\-\char"200C}
\else
 \newcommand{\breaklig}{\-\hspace{0pt}}
\fi

\else
% If *not* running under LuaLaTeX, provide dummy
% definitions for package's four main user macros
% as well as for the auxilliary macros \selnoligon,
% \selnoligoff, \debugon, and \debugoff.
\newcommand{\nolig}[2]{}
\newcommand{\keeplig}[1]{}
\newcommand{\uselig}[1]{\mbox{#1}}
\newcommand{\breaklig}{\-{\hspace{0pt}}}
\let\selnoligon\relax
\let\selnoligoff\relax
\let\debugon\relax
\let\debugoff\relax

\fi


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

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


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

\if@german
 \ifluatex % German ligature suppression rules
```

```
      \RequirePackage{selnolig-german-patterns}
   \fi
   \if@addlhyph
      \RequirePackage{selnolig-german-hyphex}
   \fi
\fi


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

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

D The package's lua code: selnolig.lua

```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 from Taco Hoekwater,
--   Patrick Gundlach, and Steffen Hildebrandt.
--
-- 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".

selnolig = { }
selnolig.module = {
  name      = "selnolig",
  version   = "0.260",
  date      = "2013/09/21",
  description = "Selective suppression of typographic ligatures",
  author    = "Mico Loretan",
  copyright  = "Mico Loretan",
  license   = "LPPL 1.3 or later"
}

-- Define variables corresponding to various text nodes;
-- cf. sections 8.1.2 and 8.1.4 of LuaTeX reference guide
local rule   = node.id('rule')
local glue   = node.id("glue")
local kern   = node.id('kern')
local glyph  = node.id('glyph')

debug=false -- default: don't output detailed information
zwnj =true -- default: don't use zwnj method


-- Define the "blocknodes"
-- 1st blocknode type: whatsit of type "userdefined"
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
```

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

-- second type of blocknode: a ZWNJ character
local zwnjnode = node.new(glyph)
zwnjnode.char = 8204 -- hex "200C" = 2*16*16*16+12
-- Further attributes, such as subtype, font, and lang,
-- will be assigned later

local noliga  = {}
local keepliga = {}      -- String -> Boolean

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

local suppression_on = true
 -- if false, process_ligatures won't do anything

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)
 -- Start 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

-- The main function is called 'process_ligatures'
-- After checking that ligature suppression is to be performed,
-- two local functions, build_liga_table and apply_ligatures
-- are set up. The function's work is done in a 'for' loop.

function process_ligatures( nodes )
 -- don't do anything if suppression_on isn't 'true'
 if suppression_on then

 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
    if zwnj then
     debug_info("Inserting zwnj character before glyph: "
       ..unicode.utf8.char(curr.char))
     zwnjnode.subtype = curr.subtype
     zwnjnode.font   = curr.font
     node.insert_before(hh, curr, node.copy(zwnjnode) )
```

```
   else
    debug_info("Inserting nolig whatsit before glyph: "
     ..unicode.utf8.char(curr.char))
    node.insert_before(hh, curr, node.copy(blocknode) )
   end
   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

-- The main loop starts here
for t in node.traverse(nodes) do
 if t.id==glyph then
  s[#s+1]=unicode.utf8.char(t.char)
 end
 if (t.id==glue or t.next==nil or t.id==kern or t.id==rule) then
  local f=unicode.utf8.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
```

```lua
        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 of main loop
 end -- end of "if suppression_on"
return nodes
end

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

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

function enable_suppression(val)
 suppression_on = val
 if val then
   debug_info("Turning ligature suppression back on")
 else
   debug_info("Turning ligature suppression off")
 end
end

function enableselnolig()
 luatexbase.add_to_callback( "pre_linebreak_filter",
   process_ligatures, "Suppress ligatures selectively", 1 )
end
function disableselnolig()
 luatexbase.remove_from_callback( "pre_linebreak_filter",
   "Suppress ligatures selectively" )
end
```

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

```
% !TEX TS-program = lualatex
% selnolig-bugreport.tex, 2013/08/31

\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
 % these macros are defined in selnolig.sty

\subsection*{Type-I errors: Words that contain ligatures that should be suppressed}

[List words here]

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

[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}
```

F A small-scale case study: f-ligatures suppressed in selected English and German pieces of literature

As noted in the introduction, the suppression of ligatures that cross morpheme boundaries is generally not considered to be an urgent typographical priority in English language documents, possibly because words with ligatures that cross morpheme boundaries aren't used particularly frequently. I performed a quick—and statistically certainly entirely unrepresentative—check of this conjecture by typesetting three novels by Charles Dickens (*David Copperfield*, *Bleak House*, and *Nicholas Nickleby*), two novels by Jack London (*Call of the Wild* and *The Sea Wolf*), and Charles Darwin's *Origin of Species* with selnolig, with the package set to capture only "basic" f-ligatures. The outcome:

Author	Piece	Words for which f-ligatures are suppressed (if a word occurs more than once, the total count is listed in parentheses)
Darwin	*Origin of Species*	fifth (7), four-fifths, twelfth
Dickens	*David Copperfield*	fifth
Dickens	*Bleak House*	fifth, twelfth, cumfbler (2) [!], getoutofbedandbawthstahlishment [!!]
Dickens	*Nicholas Nickleby*	fifth, twelfth
London	*Call of the Wild*	wolflike
London	*The Sea Wolf*	fifth (3)

Not exactly a whole lot of activity, right?!

The situation is quite different for German language texts. In Thomas Mann's novel *Die Buddenbrooks*, for instance, 433 non-unique words are caught by selnolig's rules. Incidentally, the fi-ligature in the words Kaufinger and Kaufingerstraße is suppressed because "Kaufinger" ("chew-finger") may look unintentionally hilarious.

f-lig.	Words in *Die Buddenbrooks* for which f-ligatures are suppressed by selnolig's rules (433 total)
fb, ffb	Aufbahrung, aufbegehrt, aufbegehrte, Aufbewahrungsort, Aufbietung, aufblicken, aufblitzenden, aufblitzt, aufblitzten, aufblühende, aufbrach, aufbrechen, aufbringen, aufbringt, Aufblick, Aufbrausen (2), Aufbruch (4), Briefbeschwerer, Dampfbrot, daraufbringen, greifbaren, Greifbares, heraufbefördert, hinaufblickte, Hofbräu, Hofbräuhaus (3), Hofbräuhause, Kopfbewegung (3), Kopfbewegungen, Krippenaufbaus, Laufbahn, Privatbriefbogen, Scharfblick, Schiffbrüchen, Schlafbedürfnis, steifbeinigen, Stiefbruder (4), strafbar (2), tiefbelustigt, tiefblauen (2), unangreifbar
ff	Auffahren, Auffahrt, auffallend (5), auffassen, Auffassung, auffordern (2), aufforderte (4), Aufforderung (2), Aufforderungen, Aufführung, auffällig (2), auffällige (2), auffälliger (2), auffällt, aufführen, aufführte, fünffacher (2), herauffuhr, heraufführte, Kauffahrteischiffen [Type II error/archaic spelling?], Liebhaberaufführung, Schlaffrisur, unauffällig, unauffällige
ffi	Auffinden
ffl	ffl → ffl: Aufflackern, aufflog; ffl → ffl: unübertrefflich (3), unübertrefflichen, vortrefflich (11), vortreffliche (2), vortrefflichen, vortrefflicher, vortreffliches, vortrefflichsten
fh, ffh	aufheben (3), Aufhebens, aufhebt, Aufhebung, aufheitert, aufhellte, aufhielt (3), Aufhorchend, aufhorchenden, aufhält (2), aufhören (14), aufhörte (6), daraufhin (2), Fünfhausen (2), fünfhundert (5), Hundertsiebenundzwanzigtausendfünfhundert [!!], Kaufherren (2), krampfhaft (6), krampfhafte (2), krampfhafte, krampfhaften (4), Schlaffheit, Steifheit (2), unaufhaltsam (5), unaufhaltsame, unaufhaltsamen, unaufhaltsamer, unaufhörlich (14), unaufhörliche, unaufhörlichen
fi	Kaufinger, Kaufingerstraße, tiefinnere
fj	Aufjauchzen, elfjährig, fünfjährigen, zwölfjährig (2)

fk, ffk	aufkam, aufklingen, aufklärte, Aufklärung, aufkommen, Briefkasten, Haffkrug, heraufkamen, heraufkommen (3), Heraufkommenden, Kehlkopfknoten, Kopfkissen (2), Napfkuchens, Stopfkugel (2)
fl	auflehnte, aufleuchtete (2), auflösen, auflöste, Auflösung (11), begreiflich, Begreiflicherweise, behilflich (6), beruflichen (3), glimpflich (2), gräflichen, Großkaufleuten, Handgreifliches, hilflos (7), hilfloses, Hilflosigkeit (2), Hilflosigkeitsgefühl, hinaufläuft, höflich (7), höfliche (2), höflichen, Höflichkeit (6), Höflichkeitsform, höflichst, kampflose, kampflosen, Kaufleute (9), Kaufleute-Witwenkasse, Kaufleuten (3), Knopfloch, käuflich (2), reiflich, schimpfliche, schimpflichen, schlaflos, schlaflose, schlaflosen, Schlaflosigkeit, steiflehnige, teuflischem, teuflischer, teuflisches, tiefliegende, tiefliegenden (20), unbegreiflich (3), unbegreifliche, unbegreiflichen (3), unbegreiflicher, Unbegreiflicherweise, unerschöpflich, unhöflichen, Verzweiflung (23), verzweiflungsvoll (2), Zöpflein, zweifle (2)
ft	auftat (2), auftauchen, auftauchte, auftauen, auftreten, Auftreten (3), Auftritt (3), Auftritte (2), Auftritten, Auftrittes, auftrittst, Aufträge, Briefträger, elftausend, Elfter, Elftes (3), fünftausend (2), fünften (3), fünfter, Fünfter, Fünftes (9), Hoftheater, Hoftheaterbesuchen, Hoftore (2), Hoftür, schlaftrunkenen, schlaftrunkener, Schnupftuch (3), Schnupftuche, Schnupftuches, Tauftages, Zwölftes

And here are the analogous compilations for Johann Wolfgang Goethe's *Faust I* and *Faust II*:

f-lig.	Words for which the f-ligatures are suppressed by selnolig's rules
Faust I (30 words total)	
fb	aufbewahrt, aufbindend, Schiffbruchs, Strumpfband, tiefbewegte
fh	fünfhundert
fl	hilflos, höflich, Höflichkeit (3), Unhöfliches, Verzweiflung (2), teuflisch, teuflischen (2), unbegreiflich (3), würfle
ffl	Schifflein, trefflich (4), treffliche, trefflichen, trefflicher
ft	Auftrag
Faust II (31 words total)	
fb	Aufbau, aufbewahrt, aufblühender, Raufbold, Ungreifbarer
fh	unaufhaltsam (2)
fl	flehn [Type II error!], fünften, greiflich, höflich (2), Liebesbrieflein, Scherflein, schimpflich, sträflich, Tiefauflauerndes, Tröpflein, überteuflisch, unbegreifliche, unbehülflich, Verwerfliche, Verzweiflung, Zweifler, verwerflich, verzweiflend, zweiflen
ffl	trefflich
ft	Auftrag, Auftretend, Fünftausend

Observe that there is a Type II error, *viz.*, the word "flehn" (better: flehn), in the word list for *Faust II*. This error, which I've deliberately not removed, serves to illustrate (just in case this wasn't already clear) that the selnolig package is not and cannot ever be entirely error-free.

If you use the package in your work, I recommend that you compile your document with \debugon turned on from time to time. Doing so will write the results of selnolig's work to the .log file. Then, examine the log file, either directly or via a machine search for lines containing the string "ligature suppression". (This is, by the way, precisely how I started putting together the word lists shown above.) Any Type II errors should be fairly easy to spot. To fix them, you can edit your file and encase the words in question in \uselig instructions, or you can create new \keeplig instructions to override the action of the offending \nolig instructions. When creating new \keeplig rules to reduce the number of Type II errors, do take care not to introduce new Type I errors in the process. For instance, don't create the rule \keeplig{flehn}, as doing so would cause selnolig to fail to break up the fl ligature in, *inter alia*, auflehnen, Autokopflehne, Stofflehne, and steiflehnig.