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

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Abstract

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

For English and German language documents, the selnolig package provides extensive rules for the selective suppression of so-called "common" ligatures. These comprise the ff, fi, fl, ffi, and ffl ligatures as well as the ft and fft ligatures. 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 fjord.

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 2012 or 2013 and MiKTEX 2.9.

Contents

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[*]Current version: 0.250. 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 involve the fb, fh, fj, fk, ffb, ffh, ffj, ffk, and sk glyphs. "Common", "discretionary", and "historic" typographic ligatures are enabled for these 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 often offered up as one of the reasons for using these programs to obtain high-quality typeset output.

However, even though the automatic use of typographic ligatures is highly desirable in general, there are words for which the use of certain typographic ligatures may not be appropriate. The TEXbook observes, on page 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. Observe that all three of these words are composed of two *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. Stated formally, the main purpose of the selnolig package is to provide methods and rules for an automated yet selective (rather than global) suppression of typographic ligatures that span certain morpheme boundaries.

For English language documents, the need to suppress typographic ligatures that span morpheme boundaries does not appear to be a hugely pressing typographic concern, possibly because English doesn't feature composite words that frequently. However, in other languages, such as German, composite words are much more common. In these languages, there is naturally a much greater potential for composite words to feature instances of ff, fi, fl etc. character pairs spanning morpheme boundaries. In German typography, a ligature that spans a morpheme boundary appears to be something that should be avoided at (nearly) all cost, presumably because the presence of the ligatures has the potential to impair seriously the intelligibility of the composite words.[1]

TEX and Friends offer several methods for suppressing ligatures on a case-by-case basis.[2] However, these methods must be applied separately to each and every occurrence of all words that contain 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 certain ligatures should be suppressed will be overlooked in the editing process.

What has *not* been available so far is a LATEX package that (a) provides a list of word patterns and entire words for which ligatures should be suppressed and (b) systematically discovers all instances of these patterns in a document and applies the non-ligation rules automatically to all words for which one or more pattern matches obtain. The selnolig package is meant to address this need. The package is currently set up to handle

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[1] For German texts, I believe that the *Duden* provides authoritative backing for questions related to selective ligature suppression. For English texts, I'm not aware of the existence of a document, issued by an official or quasi-official body, that prescribes whether ligatures that span morpheme boundaries should be suppressed. If anybody can provide such a reference, I would be happy to list it.

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

non-ligation issues for English and German language documents by providing extensive lists of ligature suppression rules tailored to the respective languages. Of course, I make no claim as to the completeness of either list. The package therefore makes it straightforward for users to provide their own supplemental ligature suppression rules to treat words not already covered by the package.[3]

For both English and German language documents, the selnolig package provides rules to suppress *selectively* the following f-ligatures: ff, fi, fl, ffi, and ffl—the "standard" f-ligatures that should be familiar to most users of Computer Modern fonts—as well as the ft and fft ligatures. The latter two ligatures, while not provided by the Computer Modern 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 popularity of these font families for typesetting, the selnolig package provides ligature suppression rules for many of the ligatures provided by these font families.

For both English and German language documents, the fb, fh, fj, and fk ligatures are suppressed *globally*; see also Section 5.6. However, exceptions are provided in order not to suppress these ligatures for selected words of *non-English/German* origin, such as fjord, fjell, Prokofjew, and Kafka.

For English language documents, the selnolig package recognizes an option called `broadf`; if it is set, additional f-ligatures will be suppressed selectively. The package also features an option called `hdlig` to provide selective ligature suppression for discretionary (aka rare) ligatures such as ct, st, sp, sk, th, at, et, ll, as, is, and us. No rules are currently provided to suppress historic/discretionary ligatures for German documents.[5]

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.

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 are `UKenglish`, `british`, `USenglish`, `american`, `canadian`, `australian`, and `newzealand`.

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

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

[5] A remark on the classification of various forms of typographic ligatures in OpenType fonts: There appears to little terminological standardization as to which typographic ligatures are labelled "historic" and which ones are labelled "discretionary". To wit, the fonts Latin Modern Roman, Garamond Premier Pro, and Hoefler Text report having "only" discretionary ligatures, whereas Junicode, Cardo, EB Garamond, and Palatino Linotype report having both historic and discretionary ligatures. Interestingly, none of these fonts report having ligatures classified as either "contextual" or "required".

If you want to load a broader set of f-ligature suppression rules than the set that's enabled by default, be sure to also specify the option `broadf`; see Section 5.3. If you enable "historic" and/or "discretionary" ligatures (e.g., ct, st, sp, *th*, *as*, *is*, and *us*) for your document's text font(s), be sure to specify the option `hdlig` as well. The options `hdlig` and `broadf` may be specified independently.

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

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

  Synonymous options: `german`, `austrian`, `naustrian`, `swissgerman`, and `swiss`.

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

  ```
  \usepackage{selnolig}
  ```

  but if one or more of the language options noted above are specified as options 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 may be called for if you write in a language other than German or English.

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.[6] 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 most important changes you'll need to make are:

(i) Do not load the `inputenc` and `fontenc` packages.

(ii) Load the `fontspec` package.[7] Then, use commands such as `\setmainfont` and `\setsansfont` 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. If you wish to use a different font family, further 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.

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[6] 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.

[7] 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.

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

```
lualatex myfile
```

rather than either `latex myfile` or `pdflatex myfile`. 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 has to create various cache files to store font-related information. Subsequent compilation runs should be much faster.

The answers to the questions Frequently loaded packages: Differences between pdfLATEX and LuaLATEX? and Using LuaTEX as a replacement for pdfTEX, both posted to tex.stackexchange.com, provide very useful information for people who are new to LuaLATEX and are at least somewhat familiar with pdfLATEX's ways of getting things done. 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 your document loads the babel package, be sure to load the selnolig package *after* the babel package, so that the supplemental hyphenation patterns provided by the selnolig package won't get clobbered by babel's hyphenation settings.[8]

LuaLATEX natively supports the so-called UTF-8 input encoding scheme; in fact, it is also the *only* input encoding scheme that LuaLATEX knows about. The selnolig package assumes that the TEX files it operates on conform to this input encoding method. Nowadays, many modern TEX-aware editors support UTF-8 directly; selnolig should have no problems with TEX files produced by these editors. Older files, however, may use other input encoding systems. If your input files currently use a different input encoding scheme, e.g., LATIN1, you must convert them to UTF-8. Several methods exist for changing a file's input encoding scheme; see the question How to change a .tex file's input encoding system (preferably to UTF-8)? and the associated answers on tex.stackexchage.com for some possibe 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.[9] It is also assumed that you use the triple-f (modern) spelling of words such as `Schifffahrt`, `Stofffarbe`, and `grifffest` and the double-t (modern) spelling of words such as `Mannschaftttest`.

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[8] The selnolig package is also compatible with the hyphsubst package (which, if used, should be loaded with a \RequirePackage statement *before* the \documentclass instruction). With TEXLive2013, it may also be possible to use the polyglossia package with LuaLATEX and hence with selnolig, but I haven't verified that this is the case.

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

Finally, all `babel`-style ""|"" ligature-suppressing shortcuts should either be removed entirely or be replaced with `\breaklig` instructions; the selnolig package's `\breaklig` macro is explained in Section 4.2.4.[10]

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 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,[11] 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 the word's readability if readers experience the need to do a "double take" to separate out the morphemes used in the composite word.

What exactly are morphemes? Briefly put, morphemes are the smallest linguistic units within a word that carry *meaning*. Because words are, by definition, standalone units of text, each word contains at least one morpheme.[12] 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 alone as a (meaningful) 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" reverses the meaning of the associated free morpheme "true", and the "ful" in "shelfful" changes the word's meaning from a noun to a quantity measure ("two shelffuls of books on typography"). An *inflectional* morpheme signifies a less fundamental change in meaning. In nouns (and, depending on the language, adjectives as well), inflectional morphemes indicate plural forms (child vs. children, cat vs. cats) and other forms of declination.[13] In verbs, inflectional morphemes indicate conjugation, such as a change in tense or of the subject performing the action implied by the verb. E.g., call vs. called, walk vs. walked, and also "swim" vs. "swims", etc.

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

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

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

[13] 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.

Words containing more than one morpheme can contain either "just" free morphemes—rooftop, newspaper, etc.—or free and bound morphemes joined together—untrue, shelfful, childish, etc. The bound morphemes in a word generally occur either as a prefix or a suffix 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 represent either derivational or inflectional morphemes. For instance, the suffixes like and less in dwarflike and leafless are derivational 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 crosses a morpheme boundary, between the free morpheme *umbrella* and the suffix *s*. Nevertheless, I'm quite confident that few will claim that the presence of the *as* ligature detracts from the readability of the word *umbrellas*. I believe there are two reasons why this particular word's readability is not impaired by the presence of a ligature that spans a morpheme boundary. 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.

The selnolig package adopts the following broad principles: First, ligatures that cross the boundaries 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. Third, ligatures that span the boundary between a free morpheme and an inflectional morpheme are not suppressed. As will be shown below, this third principle is particularly relevant for decisions related to the suppression (and non-suppression) of ft and fft ligatures in German texts.

It is worth observing that morphemes (which convey meaning) need not coincide with *syllables* (which convey pronunciation and sound). Indeed, a word can contain several syllables but consist of only one morpheme (e.g., apple, orange, banana), or it can consist of only one syllable but contain more than one morpheme (e.g., cats, dogs, reads, reeds, seas, and sees). The fact that a ligature may span a syllable boundary within a word (and, possibly, a hyphenation point as well) does not, by itself, imply that this ligature should be suppressed. To wit, consider the German adjective "straff" and its associated forms straffe, straffer, straffen, etc.: the free morpheme in all of these words is straff, while the suffixes e, er, and en represent inflectional morphemes. Even though there's a syllable boundary between the two fs for all modified forms of the adjective straff, the ff-ligature is used for all forms because it doesn't span a *morpheme* boundary. If TeX's hyphenation algorithm decides it needs to hyphenate the word straffen as straf-fen to generate a good line break, it can do so—and break up the ligature in the process. There's no need, though, to break up a ligature pre-emptively just because the word might get hyphenated in the middle of the ligature.

3.2   Ligature suppression rules: English language case

Unless the broadf option is set (see below), typographic ligatures are suppressed as follows:

- if two free morphemes are joined: halfline → halfline, shelflife → shelflife, rooftop → rooftop, halftone → halftone, wolftrap → wolftrap, houndstooth → houndstooth, arctangent → arctangent, newspaper → newspaper, clothespin → clothespin, *seastrand → seastrand*, etc.

- if a prefix (usually either a free or a derivational morpheme) and main word are joined: offload → offload, mistrust → mistrust, display → display, etc.

- if a main word and a suffix are joined, *if* the suffix is a derivational morpheme that begins with an f or an l (other than "ly"): shelfful → shelfful, leafless → leafless, dwarflike → dwarflike, leaflet → leaflet, etc.

- The ft ligature is also suppressed in words that end in `fth`: fifth → fifth, twelfth → twelfth. Note that the particle `th` is a derivational morpheme. Moreover, in English the `th` character pair is pronounced in a distinctive way. It thus seems inadvisable to obscure its presence with an ft ligature.

In addition, if the `broadf` option is set, the `selnolig` package will suppress

- fi and ffi ligatures that arise if the main word ends in f and the suffix starts with an i, regardless of whether the suffix is a derivational or an inflectional morpheme: elfin, selfish, golfing, surfing, beefier, fluffily, goofiness, standoffish, jiffies, buffiest, etc. Setting the `broadf` option also instructs selnolig to split up ffi ligatures in words such as fluffiness and fluffily;

- fl and ffl ligatures in words such as chiefly, briefly, and gruffly; and

- ft ligatures in words such as fifty and fiftieth.[14]

Note that the option `broadf` is *not* enabled by default. This is because I believe that any gain in readability that might result from breaking up the f-ligatures caught by the rules enabled by the `broadf` option would be minor and, importantly, outweighed by the visual clashes created by the unligated fi, ffi, fl, and ffl glyphs.

3.3 Ligature suppression rules: German language case

For German words, the following principles apply when it comes to deciding which ligatures to break up and which ones to permit. 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 ft and fft ligatures.

- Case 1: Joining of two free morphemes: Ligatures are suppressed if they span the boundary of two *free* morphemes. Examples: Schilfinsel → Schilfinsel, Baustoffingenieur → Baustoffingenieur, Wasserstoffionen → Wasserstoffionen; Impffurcht → Impffurcht, Senffabrik → Senffabrik, Ablauflogik → Ablauflogik, Schorfflecken → Schorfflecken; fünffingrig → fünffingrig; Brieftaube → Brieftaube, elfteilig → elfteilig, Stofftasche → Stofftasche, etc.

- Case 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 in this case as well. In German, by far the most common prefix that gives rise to the need to suppress various f-ligatures is the word "auf", as in aufbrechen, auffassen, Aufführung, auffliegen, auffischen, aufhören, aufisst, aufjaulen, aufklingen, Auflage, Auftrag, auftreten, etc.

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[14]If ligatures were not disabled for these words, they would be typeset as chiefly, briefly, gruffly, fifty, and fiftieth, respectively.

- 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".

  - Case 3a: Suffixes that start with an "f", e.g., `-fach` and `-faltig`. Examples: fünffach and zwölf-faltig. The ff-ligature should be suppressed.

  - Case 3b: Suffixes that start with an "i", such `-ig`, `-in`, and `-isch`; these suffixes can be either derivational or inflectional morphemes. Examples: streifig, äffisch, Chefin, Chefinnen. The fi and ffi ligatures should *not* be suppressed.

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

  - Case 3c: Suffixes (free or bound morphemes) that start with an "l", e.g., `-lich`, `-ling`, `-lein` and `-los`. Example words: trefflich, höflich, Prüfling, Köpflein, and straflos. The fl-ligature is suppressed in all of these instances.

  - Interlude I: In ambiguous cases that could give rise to fl-ligatures that involve certain suffixes, preference should be given—according to *Duden*—to "how the syllables are pronounced and how a word would be hyphenated", leading to a suppression of the fl-ligature. For instance, the fl-ligature is suppressed in Verzweiflung, Bezweifler, schweflig, and würflig; note that the real suffixes in these words are `ung`, `er`, and `ig`, respectively, rather than `lung`, `ler`, and `lig`.[15]

    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 verbs such as büffeln, löffeln, schaufeln, stiefeln, verteufeln, and zweifeln: they are typeset *without* the fl- or 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 mentioned explicitly by *Duden*, I believe this convention 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 either).

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[15]In my opinion, the rationale given for the suppression of the fl-ligature in these cases—reliance on how the syllables are divided and how the composite words are hyphenated—is not entirely satisfactory because, morphologically speaking, the words Schwefel, Würfel, Zweifel, etc. contain two morphemes: a stem and the *derivational* morpheme el: `Schwef|el`, `Würf|el`, and `Zweif|el`, etc. It is therefore not necessary, in my opinion, to create a separate rule to justify the (non-)use of the fl-ligature in these cases. One could, instead, rely on the presence of two morphemes to motivate the suppression of the fl-ligature for words such as schweflig, teuflisch, würfle, and Verzweiflung, as their components are `schwef|[e]l|ig`, etc. However, I believe it's fair to say that most modern German speakers would barely be aware of the fact that the `el` particle constitutes a separate morpheme in words such as Würfel and Griffel, and that they would be entirely unaware of its presence in words such as Schwefel and Zweifel. At any rate, the typographical convention *not* to use the fl-ligature in words such as schweflig, Verzweiflung, and würflig does *not* appear to be based on the fact that letters f and l in these words belong to different morphemes.

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.

– Case 3d: Word stem (free morpheme) ending in `f` and derivational or inflectional morphemes starting with `t`. Unfortunately, not much official wisdom seems to exist to guide this case, possibly because in German ft and fft ligatures are not (yet?) used as widely as are the other f-ligatures. The following rules should thus be understood to be somewhat provisional.

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

  * Should ft and fft ligatures be broken up in the past-tense and past-participle forms of verbs that do not end in ft but, rather, in -fte, -ften, -ftes, -ftest, etc? Example words: `streifte`, `schlürftest`, and `rafften`. Because these suffixes are merely *inflectional* rather than derivational morphemes, the selnolig package takes the approach of *not* breaking up the ft and fft ligatures in these cases. Thus, the words will be typset as streifte, schlürftest, and rafften rather than as streifte, schlürftest, and rafften.[16]

  * 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` character represents a derivational morpheme, the ligature occurs at *end* of the word or word fragment. In the case of the word "zwölftschnellste", the argument for keeping the ft ligature is based on the observation that the entire fragment "zwölft" serves a prefix to "schnellste".
    In contrast, the ft-ligature should *not* be used in "Beethoven's Fünfte Sinfonie" and "zum elften Mal". Observe that the argument in favor of breaking up the ft-ligature in the words "Fünfte" and "elften" is *not* related to the fact that the words happen to have two syllables and that the syllables are divided between the letters `f` and `t`.

– Case 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 representing either a derivational or an inflectional 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, bekräftigen, Haftung, and vernünftig. The fact that a syllable boundary occurs between the letters `f` and `t` in some of these words should not affect the decision whether or not to employ the ligature.

---

[16]I will concede, again, that 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 it.

4 Structure of the selnolig package

4.1 Components of the package

The selnolig package has the following components:

- The main "driver" file is called selnolig.sty. It loads several other files and sets up the package's main user macros, `\nolig`, `\keeplig`, and `\breaklig`. These macros are explained in more detail in the following 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.

- 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 the selnolig package as well as either selnolig-english-wordlist.tex or selnolig-german-wordlist.tex. They serve to demonstrate the output of the selnolig package when run on lists of English or German words that are candidates for non-use of ligatures. The files selnolig-english-test.pdf and selnolig-german-test.pdf contain the results of compiling the test programs. 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.

4.2 The package's user commands

The file selnolig.sty should be loaded with a `\usepackage` statement, generally with one or more options; see Section 5 for a discussion of the available options.

After setting up several Boolean switches to structure the processing of options, the package loads the file selnolig.lua, which contains the package's lua code. The package then sets up several user macros. The four main user macros are `\nolig`, `\keeplig`, `\uselig`, and `\breaklig`; the first two are meant to be used on a document-wide basis, while the latter two should be used to meet *ad hoc* typesetting needs.

4.2.1 The `\nolig` macro

The package's main user macro is called `\nolig`. Each `\nolig` instruction, or rule, takes two arguments: a search string and a string that indicates where the non-ligation "whatsit" should be inserted. E.g., the rule

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

suppresses the ff-ligature in words such as "shelfful", "bookshelfful", and "selffulfilling".

It is possible to indicate more than one ligature suppression point in the second argument of a `\nolig` rule. For instance, one *could* specify the rule `\nolig{Auflaufform}{Auf|lauf|form}` to suppress both the fl- and the ff-ligature in the word Auflaufform (and its plural form, Auflaufformen). For added flexibility, though, the selnolig package actually uses two separate rules to suppress the two ligatures in this word; see also Section 6.3.

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

```
\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`.[17] Incidentally, it is not absolutely 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 suppress that material.

If you examine the `\nolig` rules provided in the files selnolig-german-patterns.sty and selnolig-english-patterns.sty, you'll notice quickly that there's some redundancy built into the package's ligature suppression rules. For instance, the need to suppress the ff-ligature in the word "auffallen" is catered to both by `\nolig{auff}{auf|f}` and by `\nolig{ffall}{f|fall}`. This redundancy is there by design, because not all words that might fit one pattern will also fit the other. Providing some redundancy of this type seems like a reasonable way to proceed.

The arguments of the `\nolig` and `\keeplig` commands are case-sensitive.

4.2.2 The `\keeplig` macro

The instruction `\keeplig{<string>}` lets users override a `\nolig` rule selectively, i.e., words that contain fragment `<string>` will not see the corresponding `\nolig` rule enforced. For a `\keeplig` rule to work properly, its argument must be a string that includes *as a subset* a string treated by one or more `\nolig` rules.

Having the macro `\keeplig` is very useful because it permits the specification of more general, i.e., less restrictive, `\nolig` rules; any Type-II errors that may arise from having `\nolig` rules whose scope may be insufficiently restrictive can be fixed by providing judiciously chosen `\keeplig` rules.[18]

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

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

to break up the fl-ligature in words such as begrifflich, beruflich, brieflich, glimpflich, hilflich, höflich, käuflich, sträflich, tariflich, trefflich, unerschöpflich, and verwerflich (and quite a few more such words), which all contain the suffix `lich`, a derivational morpheme. This `\nolig` rule also happens to catch the word "Lauflicht", which contains the free morphemes `Lauf` and `licht`.

---

[17]These particular search strings are used so as not to suppress the ff-ligatures in words that *end* in either `Dorff` or `dorff`, such as is the case with the surnames Dorff and Hausdorff.

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

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

    \keeplig{flicht}

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". Interestingly, this instruction also serves to preserve the fl-ligature in words such as "flicht" and "anflicht" (the third-person-singular forms of the verbs flechten and anflechten).

Probably somewhat surprisingly, at least at first glance, it is *not necessarily* the case that ligatures contained in the argument of a `\keeplig` rule will, in fact, be used in words that contain this search string. Why? It is because, as was noted above, *more than one* `\nolig` rule can apply to a given word. Consider, for instance, the aforementioned word `Lauflicht`: this word happens to be caught by two `\nolig` rules and one `\keeplig` rule (provided in the file selnolig-german-patterns.sty):

    \nolig{aufl}{auf|l}
    \nolig{flich}{f|lich}
    \keeplig{flicht}

Observe that because the string `aufl` is *not* a subset of the string `flicht`, the rule `\keeplig{flicht}` does not undo the action of the rule `\nolig{aufl}{auf|l}`. Hence, the word `Lauflicht` happily ends up being typeset as Lauflicht, i.e., *without* an fl-ligature.

Interestingly, the rule `\keeplig{flicht}` is a bit too broad as well, as it also catches the word `Sumpflicht`, for which the fl-ligature *should* in fact be suppressed (since the word is composed of two free morphemes, Sumpf and Licht). To address this situation, the file selnolig-german-patterns.sty also provides the rule `\nolig{Sumpfl}{Sumpf|l}`. This rule suppresses the fl-ligature for Sumpflicht as well as for Sumpflabkraut and Sumpfleiche (and the plural forms of these nouns).

4.2.3 The `\uselig` macro

The selnolig package further provides the user command `\uselig`. It acts much like the `\keeplig` command, but serves to override the action of a `\nolig` rule purely on a one-off basis. E.g., the command `\uselig{fj}` will typeset "fj" even though the rule `\nolig{fj}{f|j}` is active; *without* `\uselig`, you'd get "fj".

You should use `\uselig` instructions only for words and word fragments, but not 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.

4.2.4 The `\breaklig` macro

The macro `\breaklig`, which doesn't take an argument, is provided as a hopefully easy-to-remember version of 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" to get *groundskeeper* instead of *groundskeeper*.[19]

4.3   Further steps in the package's startup process

After the user commands of the selnolig package have been set up, the remaining steps in the package's startup process depend on which language-related options, if any, were selected:

- If *no* language-specific options are in effect, the setup process terminates. Users may, of course, still provide their own \nolig and \keeplig rules and insert \uselig and \breaklig instructions as needed.

- 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 hyphenation 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.

Here's an (admittedly 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.[20] In contrast, the set of German language ligature suppression rules for the "common" f-ligatures consists of roughly 700 \nolig and 335 \keeplig directives.

5   Additional ligature-related matters

5.1   The package's main language options

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

---

[19]To suppress the *sk* ligature for this word as well as for words such as *greenskeeper* and *miskeep* everywhere in the document, one could issue the directive \nolig{skeep}{s|keep}; the selnolig package provides just such a rule.

[20]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.

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

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

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

The English and German ligature suppression rules are listed in Appendices A and B, respectively.

5.2 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}`.[21]

5.3 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.

For English-language documents, only a fairly limited number of f-ligature suppression rules is enabled by default, i.e., if the `broadf` option is not enabled. Eliminating *all* f-ligatures that cross morpheme boundaries simply does not appear to be a major concern in English-language typography. Whereas many (maybe most?) people would agree that it's advisable not to use the ffi-ligature in words such as chaffinch and wolffish, and not to use the ffl-ligature in words such as scofflaw and offload, there appears to be much less of a perceived need to suppress the fi (ffi) ligature in the far more commonly occurring words that end in f (ff) followed by the particles -ing, -ish, -ier, -iest, -ily, and -iness.[22] The same goes for the fl (ffl) ligature in words that end in f (ff) followed by -ly.[23] That is why only a few f-ligature suppression rules are enabled by default if the `english` option is set. To enable the broader set of f-ligature suppression rules, users must set the `broadf` option explicitly.

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

---

[21] Especially for the German language case, suppressing ft and fft ligatures *globally* will also speed up compilation, as the package will have roughly 180 `\nolig` and 60 `\keeplig` instructions fewer to load!

[22] Examples of such words are surfing, oafish, leafier, goofiest, fluffily, and goofiness. With the `broadf` option set, these words will be typeset as surfing, oafish, leafier, goofiest, fluffily, and goofiness.

[23] Examples are aloofly and gruffly; with the `broadf` option set, these words will be typeset as aloofly and gruffly.

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 (rather than arctangent), painstaking (rather than painstaking), and trespass (worse: trespass). The st and sp ligatures are also suppressed automatically for words with Greek roots that contain the `sth` and `sph` character triples, such as anaesthesia, isthmus, atmosphere and hemisphere. In such cases, I'd argue that using the distinctive-looking st and sp ligatures unnecessarily obscures the th and ph character pairs (which derive from the single Greek letters θ/ϑ and ϕ/φ, respectively). Given that the ph character pair is usually pronounced as "f", I contend that the readability of words that contain the character triple `sph` would suffer considerably if they were typeset *with* an sp ligature, e.g., as atmosphere and spherical.

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 family used in this document: *th*, *at*, *et*, *as*, *is*, *us*, *sk*, *ll*, and *fr*. 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 5.7 below.

5.4   Composite words with ambiguous morphology

There may be pairs of composite words which look alike but are made up of two different pairs of morphemes. 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 would help greatly in indicating the intended meaning of the composite words. For words such as these, software isn't smart enough to "discern" which possible meaning is intended.[24] Writers, of course, could (and should?) choose to insert explicit hyphen characters to indicate the intended meaning.

The preceding two examples involve pairs of free morphemes in both cases. Here's a composite word where one possible meaning involves a free morpheme and an inflectional morpheme (indicating the past-tense use of the verb), whereas the other meaning involves two free morphemes: `Surftest`. Consider the questions, "Surftest Du vergangene Woche in Hawaii?", and "Hat die Athletin den Surftest bestanden?" Only in the second case is it clearly wrong to use the ft-ligature.

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`

---

[24]It turns out that if the `ngerman` option is set and the `babel` package is loaded as well, the `selnolig` package will break up the fl ligature in `Saufladen` but not the st ligature in `Wachstube`, i.e., the words will be typeset as "Saufladen" and "Wachstube", respectively. If that's *not* what you want, you'll need to mark up the words explicitly as follows: `\uselig{Saufladen}` and `Wachs\breaklig tube`.

("inner life, or lives, of a boss"). Thus, the word's middle particle—"innen"—can function both as a suffix (in this case, an inflectional morpheme) to "Chef" and as a free morpheme that modifies the third morpheme, "Leben". Software isn't smart enough yet to discern on its own which usage is intended.

The rules of the selnolig package are set *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, because in these cases the working assumption is that innen acts as a prefix of sorts 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: write the words in question using explicit hyphens, i.e., as 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.

Summing up: There are words for which it's not possible to decide without knowledge of the context within which the word is used whether or not a given ligature should be enabled or suppressed. The best advice I can give is to stay on the lookout for such words and to take corrective action if you believe selnolig's choice is the wrong one.

5.5 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 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 an \uselig statement. Alternatively, you could create your owb \nolig and \keeplig rules to deal with the cases you've discovered on a document-wide basis.[25]

Suppose, say, 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 the new edition, because fewer and fewer people nowadays can manage to read with ease text set in a period-appropriate blackletter font. During these preparations, you happen to notice (i) that the novel contains the word inbegriffleitend[26] and (ii) that the selnolig package does not (yet) appear to include a rule that suppresses the ffl-ligature for this word. To address this problem—while simultaneously creating a search pattern that also catches inappropriate ffl-ligatures in the (hopefully quite a bit more common!) words Jugendtreffleiter and Kunststoffleitung—you could add the following \nolig rule to your document's preamble:

        \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 actually provides the even more general (i.e., less restrictive) rule `\nolig{fleit}{f|leit}`.

When designing your own `\nolig` and `\keeplig` rules, you would ideally create them in such a way that they're neither too specific and hence only apply to a very small set of words, nor too general and hence end up applying to words for which the rule isn't meant to apply at all. 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 fl ligature in the words inbegriffleitend, Jugendtreffleiter, and Kunststoffleitung as well as in Laufleistung, Häuflein, Kreislaufleiden, Scherflein, and many more. However, this rule would also *incorrectly* break up the fl ligature in many other words as well, including fleissig/fleißig, fleischig, Hackfleisch, and Diplomfleißarbeit; I believe most 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.

5.6   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.[27]

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 issue the command

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

in the document's preamble.

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}
```

---

[27] 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`.

In fact, these commands are activated automatically if the package's `ngerman` or `english` options are set. This is done because I was unable to come up with a single instance of a *German* or *English* language word involving these character combinations that doesn't also involve 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 desirable to suppress the corresponding ligatures. One such word is `Kafka`: one may not wish to suppress the 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.[28]

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*.[29] 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 all of these words.[30] The *ij* ligature also seems inappropriate for most words that came into English from languages such as French, Japanese, and Spanish, including *bijou* (jewel), *gaijin* (foreigner), *jipijapa* (Panama hat), and *marijuana* (Maryjane). (What? Were you maybe thinking of a different meaning of this word? How come?!) The *ij* ligature is therefore suppressed *globally* by the selnolig package if the options `english` and `hdlig` are set. However, this ligature *does* get used a lot in Dutch. Thus, the selnolig package issues various `\keeplig` directives so that this ligature isn't suppressed for some names and words of Dutch origin, such as *de Bruijn* and *rijsttafel*.[31]

5.7 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* might pre-empt the use of a more appropriate ligature for the last two characters of that triple.[32]

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

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[28]Aside: It was Felix Lehmann's desire to preserve the fk ligature in the name "Kafka" that stimulated the creation of the package's `\keeplig` macro. Of course, once the `\keeplig` macro was created, all kinds of further uses were quickly discovered.

[29]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.

[30]If this ligature weren't suppressed, the preceding words would be typeset as *antijam, bijection, demijohns,* and *hijack*.

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

[32]To be sure, the issue of ligature pre-emption is not limited to "discretionary" ligatures; it can also occur with "common" f-ligatures. Suppose, for instance, that a certain font provides ff, fi, and fl ligatures but no ffi and ffl ligatures, and 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).

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 one ligature inappropriately pre-empting that for a trailing character pair.[33]

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

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

First, given the rather distinctive look of the *st* ligature, the word `stochastic` may look a bit odd if the *st* ligature is used only once—*stochastic*—simply because the *as* ligature pre-empts the second *st* ligature; readers may prefer the look of *stochastic*. Second, non-use of the st/*st* ligature may be undesirable if the same word occurs twice and in close visual proximity, once set in the upright font shape—for which there are no ligatures for the `as`, `is`, and `us` character pairs, and hence for which the issue of ligature pre-emption doesn't arise—and once in italics: must 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*. Moreover, I suspect that Austrians—at least the ones who care about discretionary typographic ligatures...—may prefer to see the name of their country typeset as *Austria* rather than as *Austria*. 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 not only pre-empts a subsequent *st* ligature but also spans a morpheme boundary, as in the words *infrastructure* and *seastrand*.[34] For such words, the *as* ligature should probably be suppressed in any case to increase the words' legibility: *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:[35]

---

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

Note that if the broadf option is set, as is the case for the document you're 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.

[34] This case was already noted in . There, two words (`wolffish` and `Schaffleisch`) are mentioned for which the ff-ligature would improperly pre-empt fi- and fl-ligatures *and* happen to span a morpheme boundary.

[35] The second of these three commands, while correct for most words that contain the string `ist`, 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.

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

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

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

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 the commonness and the distinctive pronuciation of the `th` character pair in the English language, as well as the high frequency of this character pair in words of Greek origin (for which the Latin-alphabet `th` character pair derives from the 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 words such as *Beethoven*, *prophethood*, and *sweetheart*.[36]

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`, whose readability is 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,*

---

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

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. There may also be cases of persons' names which include the string `eta` for which the *ta* ligature should not be pre-empted. For instance, the author of this package prefers to see his surname typeset as *Loretan* rather than as *Loretan*…

6 Further issues

6.1 Known bugs

I'm not sure if the following matter constitutes a bug or "merely" a case of incompatibility between two LaTeX packages. The selnolig package does not appear to interact well with the LaTeX package ngerman. The selnolig package does interact nicely with the babel package if one of the options `ngerman`, `german`, `austrian`, and `naustrian` set. Thus, unless someone can convince me that using the ngerman package is truly 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; however, this may change in the future. 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 related options); doing so also loads specialized hyphenation patterns suitable for German text.[37]

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

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

6.3   Ancillary information about the package's activity

If you execute the command \debugon, detailed information about each \nolig and \keeplig pattern match that is encountered is written to the .log file. (The package's default setting is \debugoff.)

Because of the potential redundancy in 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 commands apply simultaneously, *viz.*, \nolig{auff[aeiloruyäöü]}{auf|f} and \nolig{ffahr}{f|fahr}. For this word, 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
```

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

```
pattern match: Auflaufform - 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` pattern that ends up being written to the `.log` file.

To terminate or suspend the writing of the debugging-related information to the `.log` file, one may 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. Conversely, if selnolig's macros need to be switched back on, just issue the command

```
\selnoligon
```

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. I started the list of German language words with the examples provided by the rmligs script; 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 search patterns actually apply to a much larger number of words than those listed in selnolig-german-test.pdf. Naturally, suggestions for still more words to be de-ligated are always welcome.

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

7 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.stackexchange.com.[38] Without their expertise in programming in Lua and interfacing the lua code with LaTeX, this package would not exist. They certainly deserve most of the credit for the lua code used by the selnolig package.

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[38] 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.

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 tha 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 [!!] 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 (ca. late 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![39,40] Fortunately (for me at least), they also discovered that a non-negligible part of the 69,000 errors wasn't real but, rather, the result of typos in the words included in the corpus and/or of incorrect morphological analysis. The detailed Type I and 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.[41] All major changes to the German language ligature suppression patterns are still being subjected to their testing algorithms to streamline the tasks of detecting what's left to improve and catching any newly introduced errors.

Felix and Steffen 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 in the fall of 2012.[42] They wish to thank the Institut für Maschinelle Sprachverarbeitung at the Universität Stuttgart for granting them a license for the morphological analysis tool SMOR[43] 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,[44] as well as to Rajesh Bhatt (University of Massachusetts at Amherst), Miriam Butt (Universität Konstanz), and Sabine Schulte im Walde (Universität Stuttgart) for helping them find the right resources for their project.

The rmligs script lists hundreds of German language words for which various f-ligatures should be suppressed. I created many of the initial German language ligature suppression rules of the selnolig package to treat the words listed in the rmligs package.[45]

---

[39] 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 valid ligature.

[40] 1,000 words contained more than one potential f-ligature, hence the difference.

[41] For instance, after Steffen wrote the lua code that made possible the \keeplig macro, I was able to eliminate, in one fell swoop, more than 10,000 [!!] Type II errors generated by the package's earlier, incorrect suppression of the fl-ligature in words that contain the morpheme pflicht.

[42] Their code and finals paper is available online.

[43] 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.

[44] 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.

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

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 shortcut directives in the appropriate spots 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 careful and incisive comments on an early version of the package's user guide and English language ligature suppression rules.[46] A suggestion received from David Bellows 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 to `tex.stackexchange.com` and `comp.text.tex`, too numerous to name individually, also helped guide and influence the genesis of this package. To all of you, I express my sincere thanks.

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

---

[46] She also pointed out to me that the readability of my surname might be enhanced if it were typeset as *Loretan* instead of as *Loretan*...

Appendices

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

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

\ProvidesPackage{selnolig-english-patterns}%
[2013/06/30]

% 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{stelfink} % distelfink

% For words ending in -f-ing, allow for
% "colloquial" abbreviations (-f-in').
```

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

28

```
% (c) fl -> f-l

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

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

% (d) ffi -> ff-i

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

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

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

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

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

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

% (e) ffl -> ff-l

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

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

% (g) ffl -> f-fl
 % nothing additional in 'broad' group

% (h) ft -> f-t

\if@noftligs
\else % suppress some more ft ligatures selectively
  \nolig{ifteen}{if|teen}
   % fifteen fifteens fifteenth

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

  \nolig{fifty}{fif|ty}
  \nolig{Fifty}{Fif|ty}
   % fifty fiftyish
\fi % end of \if@noftligs conditional block

\fi % end of \if@broadfset conditional block



% Part 3: Discretionary ligatures crossing
% morpheme boundaries
% st, ct, sp,
% th, at, et, as, is, us, ta, ll, sk
% ---------------------------------------

\if@hdligset

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

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

```
% houndstooth                                   \nolig{istitl}{is|titl}
\nolig{steeth}{s|teeth}                           % mistitle
 % houndsteeth                                  \nolig{istook}{is|took}
                                                 % mistook
                                                \nolig{istouc}{is|touc}
%%% dis-t... words                               % mistouch
\nolig{dista}{dis|ta}                           \nolig{mistrac}{mis|trac}
\nolig{Dista}{Dis|ta}                           \nolig{Mistrac}{Mis|trac}
 % distant 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{istrea}{is|trea}
\nolig{Disten}{Dis|ten}                          % mistreat mistreatment
 % distended                                    \nolig{mistru}{mis|tru}
\nolig{distil}{dis|til}                         \nolig{Mistru}{Mis|tru}
\nolig{Distil}{Dis|til}                          % mistrust mistruth
 % distil distillation                          \nolig{istrys}{is|trys}
\nolig{distin}{dis|tin}                          % mistryst
\nolig{Distin}{Dis|tin}                         \nolig{mistu}{mis|tu}
 % distinct distinguish                         \nolig{Mistu}{Mis|tu}
\nolig{disto}{dis|to}                            % mistune Mistutor
\nolig{Disto}{Dis|to}                           \nolig{istyp}{is|typ}
 % distort distortion                            % mistype
\nolig{distr}{dis|tr}
\nolig{Distr}{Dis|tr}
 % distract distribution distrust               \nolig{aastricht}{aas|tricht}
\nolig{distu}{dis|tu}                            % Maastricht
\nolig{Distu}{Dis|tu}
 % disturb                                      \nolig{sthes}{s|thes}
                                                 % anaesthesia synesthesia prosthesis
                                                \nolig{sthet}{s|thet}
%%% mis-t... words                               % aesthetic esthetic unesthetic
\nolig{mista}{mis|ta}                            % prosthetist
\nolig{Mista}{Mis|ta}
 % mistake mistaken mistaught unmistakable      \nolig{stown}{s|town}
\nolig{mistea}{mis|tea}                          % crosstown Williamstown
\nolig{Mistea}{Mis|tea}
 % misteach
\nolig{istend}{is|tend}                         % (B) ct -> c-t
 % mistend distend                              % -------------
\nolig{isterm}{is|term}
 % misterm misterms                             \nolig{rctan}{rc|tan}
\nolig{isth}{is|th}                              % arctangent
 % misthink misthought misthrew misthrow        \nolig{rctat}{rc|tat}
 % isthmus calisthenic                           % coarctation
\nolig{istime}{is|time}
 % mistime mistimed
```

```
% (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{desp}{des|p}
\nolig{Desp}{Des|p}
 % despair desperado despot desperate
 \keeplig{despond} % despondency despondent
 \keeplig{Despond}
 \keeplig{despirit}
 \keeplig{Despirit}
 \keeplig{despoil}
 \keeplig{Despoil}
 \keeplig{sidesp} % sidespin, sidesplitting
 \keeplig{Sidesp}
 \keeplig{widesp} % widespread
 \keeplig{Widesp}
 \keeplig{desprung} % gelandesprung

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

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

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

```
 % blaspheme blasphemy

\nolig{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
\nolig{ranspor}{rans|por}
 % transport transportation
\nolig{ranspos}{rans|pos}
 % transpose transposon

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

\nolig{ewspa}{ews|pa}
 % newspaper
\nolig{ewspr}{ews|pr}
 % newsprint
 % Don't suppress sp lig in "newspeak"!

\nolig{Williamsp}{Williams|p}
 % Williamsport


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

\nolig{eethov}{eet|hov}
 % Beethoven
\nolig{thook}{t|hook}
 % boathook meathook pothook
\nolig{thouse}{t|house}
 % boathouse cathouse courthouse ...
\nolig{othol}{ot|hol}
 % foothold knothole potholder ...
\nolig{lthol}{lt|hol}
 % bolthole
\nolig{sthol}{st|hol}
```

```
 % posthole pesthole
\nolig{rathol}{rat|hol}
\nolig{Rathol}{Rat|hol}
 % rathole
\nolig{arthog}{art|hog}
 % warthog
\nolig{stha}{st|ha}
 % firsthand postharvest posthaste
\nolig{thawk}{t|hawk}
 % nighthawk
\nolig{horth}{hort|h}
 % shorthair shorthand shorthorn
\nolig{arthei}{art|hei}
 % apartheid antiapartheid
\nolig{thead}{t|head}
 % bolthead cathead fathead ...
\nolig{therd}{t|herd}
 % goatherd neatherd
\nolig{theap}{t|heap}
 % dustheap
\nolig{theart}{t|heart}
 % fainthearted sweetheart ...
\nolig{uthear}{ut|hear}
 % outhear outheard
\nolig{thill}{t|hill}
 % anthill foothill
\nolig{thood}{t|hood}
 % adulthood knighthood ...
\nolig{thunt}{t|hunt}
 % pothunt outhunt
\nolig{orthol}{ort|hol}
 % porthole
\nolig{sthum}{st|hum}
 % posthumous
\nolig{uthau}{ut|hau}
 % outhaul
\nolig{uthit}{ut|hit}
 % outhit
\nolig{uthom}{ut|hom}
 % outhomer
\nolig{uthow}{ut|how}
 % outhowl
\nolig{uthum}{ut|hum}
 % outhumor
\nolig{uthust}{ut|hust}
 % outhustle

\nolig{tthour}{tt|hour}
 % watthour kilowatthour
\nolig{sthm}{s|thm}
 % asthma isthmus

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

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

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

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

\nolig{ametag}{ame|tag}
 % nametag
\nolig{betat}{be|tat}
\nolig{Betat}{Be|tat}
 % betatter beta
\nolig{betr}{be|tr}
\nolig{Betr}{Be|tr}
 % betray betroth

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

\nolig{etail}{e|tail}
```

```
 % bristletail detail dovetail horsetail
\nolig{etah}{e|tah}                           \nolig{reteen}{re|teen}
 % cheetah chetah                              % preteen
\nolig{etak}{e|tak}                           \nolig{retend}{re|tend}
 % betake retake caretaker                     % pretend
\nolig{etax}{e|tax}                           \nolig{retenc}{re|tenc}
 % betax                                       % pretence
\nolig{eteach}{e|teach}                       \nolig{retens}{re|tens}
 % reteach                                      % pretense pretension
\nolig{etell}{e|tell}                         \nolig{retent}{re|tent}
 % foretell fortunetelling                     \nolig{Retent}{Re|tent}
\nolig{eterg}{e|terg}                          % pretentious retention retentive
 % detergent                                   \nolig{retest}{re|test}
\nolig{eterio}{e|terio}                       \nolig{Retest}{Re|test}
 % deteriorate                                  % pretest retest
\nolig{eterm}{e|term}
 % determent determinant preterm              \nolig{reta}{re|ta}
\nolig{etext}{e|text}                         \nolig{Reta}{Re|ta}
 % pretext retext teletext                      % retag retape retake
\nolig{ethink}{e|think}                        % foretaste caretaker
 % freethinking                                 % pretaste pretape pretaxretain
\nolig{ethrow}{e|throw}                        % retain retake retaliate retard
 % freethrow                                    % retarget retaste wiretap
\nolig{etick}{e|tick}                         \keeplig{pretable} % interpretable
 % bluetick detick                             \keeplig{cretar}  % secretary
\nolig{etide}{e|tide}
 % betide yuletide                             \nolig{reteam}{re|team}
\nolig{etigh}{e|tigh}                         \nolig{Reteam}{Re|team}
 % retighten                                    % reteam reteamed reteaming reteams
\nolig{etime}{e|time}                         \nolig{retear}{re|tear}
 % betime lifetime peacetime sometime          \nolig{Retear}{Re|tear}
\nolig{eetop}{ee|top}                          % retear retears
 % treetop                                      \nolig{retemp}{re|temp}
\nolig{etrain}{e|train}                       \nolig{Retemp}{Re|temp}
 % detrain drivetrain housetrain retrain        % retemper retempering
\nolig{etrap}{e|trap}
 % firetrap livetrap mousetrap                 \nolig{retie}{re|tie}
\nolig{etree}{e|tree}                         \nolig{Retie}{Re|tie}
 % axletree saddletree shoetree                 % retie entireties sureties
                                               \nolig{retil}{re|til}
\nolig{foret}{fore|t}                         \nolig{Retil}{Re|til}
\nolig{Foret}{Fore|t}                          % retile
 % foretaste foretell foretold foretime        \nolig{retim}{re|tim}
 % foretoken foretop foretopman               \nolig{Retim}{Re|tim}
\nolig{imetable}{ime|table}                    % retime beforetime
 % timetable                                   \nolig{retint}{re|tint}
```

```
\nolig{Retint}{Re|tint}
 % retint
\nolig{retir}{re|tir}
\nolig{Retir}{Re|tir}
 % retire retiring
\nolig{retitl}{re|titl}
\nolig{Retitl}{Re|titl}
 % retitle pretitling

\nolig{retold}{re|told}
\nolig{Retold}{Re|told}
 % retold
\nolig{retoo}{re|too}
\nolig{Retoo}{Re|too}
 % retook retool
\nolig{retor}{re|tor}
\nolig{Retor}{Re|tor}
 % retore retorn retort retorted
\nolig{retou}{re|tou}
\nolig{Retou}{Re|tou}
 % retouch retouched
\nolig{retra}{re|tra}
\nolig{Retra}{Re|tra}
 % retrace retrack retract retrans retransmit
\nolig{retre}{re|tre}
\nolig{Retre}{Re|tre}
 % pretreat retread retreat retrench
\nolig{retri}{re|tri}
\nolig{Retri}{Re|tri}
 % pretrim pretrial retrieve retribution
 % retries retrim
\nolig{etrors}{e|trors}
 % retrorse
\nolig{retrous}{re|trous}
\nolig{Retrous}{Re|trous}
 % retrousse
\nolig{retry}{re|try}
\nolig{Retry}{Re|try}
 % retry retrying

\nolig{retu}{re|tu}
\nolig{Retu}{Re|tu}
 % return retune unreturnable
\nolig{retwi}{re|twi}
\nolig{Retwi}{Re|twi}
 % retwist retwisting
```

```
\nolig{etooth}{e|tooth}
 % bluetooth eyetooth snaggletoothed
\nolig{eteeth}{e|teeth}
 % snaggleteeth eyeteeth

\nolig{deter}{de|ter}
\nolig{Deter}{De|ter}
 % deter determine deteriorate undeterred

\nolig{ceties}{ce|ties}
 % niceties
\nolig{cety}{ce|ty}
 % nicety

\nolig{feties}{fe|ties}
 % safeties unsafeties biosafeties
\nolig{fety}{fe|ty}
 % safety

\nolig{leties}{le|ties}
 % subtleties
\nolig{lety}{le|ty}
 % subtlety teletype teletypewriter

\nolig{rety}{re|ty}
 % surety entirety retype pretype

\nolig{etelev}{e|telev}
 % pretelevision
\nolig{etyp}{e|typ}
 % archetype archetypal retype pretype

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

\nolig{eastran}{ea|stran}
 % seastrand
\nolig{aspore}{a|spore}
 % diaspora megaspore tetraspore
\nolig{aseps}{a|seps}
 % asepsis
\nolig{asept}{a|sept}
 % aseptic aseptically
\nolig{asund}{a|sund}
\nolig{Asund}{A|sund}
```

```
 % asunder                              % antishark antiship antishock
\nolig{aspec}{a|spec}                   \nolig{antishi}{anti|shi}
\nolig{Aspec}{A|spec}                   \nolig{Antishi}{Anti|shi}
 % aspect infraspecific intraspecies    % antishark antiship antishock
 % intraspecific                        \nolig{antisho}{anti|sh}
\nolig{infras}{infra|s}                 \nolig{Antisho}{Anti|sh}
\nolig{Infras}{Infra|s}                 % antishark antiship antishock
 % infrastructure infraspecific         \nolig{antisk}{anti|sk}
\nolig{megast}{mega|st}                 \nolig{Antisk}{Anti|sk}
\nolig{Megast}{Mega|st}                 % antiskid
 % megastructure megastar               \nolig{antisl}{anti|sl}
\nolig{megasp}{mega|sp}                 \nolig{Antisl}{Anti|sl}
\nolig{Megasp}{Mega|sp}                 % antislavery antislip
 % megaspores megascopic                \nolig{antismo}{anti|smo}
\nolig{aspoon}{a|spoon}                 \nolig{Antismo}{Anti|smo}
 % teaspoon                             % antismog antismoke
                                        \nolig{antismu}{anti|smu}
                                        \nolig{Antismu}{Anti|smu}
% how to do 'asea'?                     % antismuggling antismut
                                        \nolig{antisn}{anti|sn}
                                        \nolig{Antisn}{Anti|sn}
% (H) is -> i-s                         % antisnob
% -------------                         \nolig{antiso}{anti|so}
                                        \nolig{Antiso}{Anti|so}
                                        % antisocial antisolar
% (a) not across morpheme boundaries    \nolig{antisp}{anti|sp}
% (The following may be a bug in fontspec) \nolig{Antisp}{Anti|sp}
                                        % antispasmodic antispeculative
\nolig{fish}{fi|sh}                     \nolig{antist}{anti|st}
\nolig{fist}{fi|st}                     \nolig{Antist}{Anti|st}
\nolig{Fist}{Fi|st}                     % antistatic antistick antistress
                                        \nolig{antisu}{anti|su}
                                        \nolig{Antisu}{Anti|su}
% (b) across morpheme boundaries        % antisubmarine antisubversion
                                        \nolig{antisy}{anti|sy}
%% Mustn't do global \nolig{antis}{anti|s} \nolig{Antisy}{Anti|sy}
%% because of words such as sycophantism, % antisymmetric antisyphilitics
%% vigilantism, and mantissa.

\nolig{antisa}{anti|sa}                 \nolig{multis}{multi|s}
\nolig{Antisa}{Anti|sa}                 \nolig{Multis}{Multi|s}
 % antisag antisatellite                % multiscreen multisense multisensory
\nolig{antisc}{anti|sc}                 % multiservice multisided multisite
\nolig{Antisc}{Anti|sc}                 % multisize multiskilled multisource
 % antiscience                          % multispecies multispectral multispeed
\nolig{antise}{anti|se}                 % multisport multistage multistate
\nolig{Antise}{Anti|se}                 % multistemmed multistep multistoried
 % antisecrecy antisense antiseptic
\nolig{antisha}{anti|sha}
\nolig{Antisha}{Anti|sha}
```

```
% multistory multistranded multisyllabic
% multisystem

\nolig{isph}{i|sph}
 % hemisphere planisphere hemispheric

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

%%% (no examples yet)


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

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

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

% The 'ij' ligature seems to have no good
% use in English-language words -- incl.
% words introduced to English from other
% languages, such as marijuana, gaijin, and
% bijou; the 'ij' ligature seems to span
% morpheme boundaries in all of these cases.
% Hence, we disable this ligature globally.
% We do make exceptions for words of Dutch
% origin, where the ij ligature does have
% legitimate uses.

\nolig{ij}{i|j}
 \keeplig{ijs} % rijsttafel (Indonesian dish)
 \keeplig{ijn} % de Bruijn



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

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

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

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

\nolig{aspar}{a|spar}
\nolig{Aspar}{A|spar}
 % asparagus Caspar aspartame asparkle
\nolig{asper}{a|sper}
\nolig{Asper}{A|sper}
 % aspersion Casper Jasper exasperate
\nolig{aspir}{a|spir}
\nolig{Aspir}{A|spir}
 % aspire aspirator aspirin
\nolig{gasp}{ga|sp}
\nolig{Gasp}{Ga|sp}
```

```
 % gasp
\nolig{hasp}{ha|sp}
\nolig{Hasp}{Ha|sp}
 % hasp
\nolig{lasp}{la|sp}
 % clasp unclasp beclasp enclasp
\nolig{rasp}{ra|sp}
\nolig{Rasp}{Ra|sp}
 % grasp rasp raspberry
\nolig{wasp}{wa|sp}
\nolig{Wasp}{Wa|sp}
 % wasp waspish

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

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

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

%% If you have 'at' and 'et' ligatures as
%% well as the 'th' ligature and want a
```

```
%% trailing 'th' ligature to take precedence
%% over these ligs, use the following rules:

\nolig{ath}{a|th}
\nolig{eth}{e|th}

% The preceding rules are a bit too
% broad as they also suppress the 'at' ligature
% for words such as boathook and flathead
% and the 'et' ligature in words such as
% Beethoven, prophethood, and sweetheart.
% Thus, also provide some \keeplig macros:

\keeplig{oathook} % boathook
\keeplig{eathook} % meathook
\keeplig{athouse} % bathouse boathouse cathouse
%%\keeplig{rathole} % this will re-enable "th" liga
%%\keeplig{Rathole} %  if "at" liga doesn't exist...
\keeplig{athead} % cathead fathead flathead meathead
\keeplig{atherd} % goatherd neatherd
\keeplig{eatheart} % greathearted
\keeplig{eetheart} % sweetheart

\keeplig{Beethoven}
\keeplig{ophethood}


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

\nolig{atap}{a|tap}
 \keeplig{catap} % catapult cataphoresis
 \keeplig{Catap}
 \keeplig{ratap} % rataplan
 \keeplig{Ratap}

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

\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}%
[2013/06/30]

% 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}                          \nolig{Sumpff}{Sumpf|f}
\keeplig{Hoffart}                            \nolig{sumpff}{sumpf|f}
\keeplig{Hoffärt}  % Hoffärtigkeit            % (viele Fälle!)
\keeplig{Hoffricht} % Hoffrichter            \nolig{Tariff}{Tarif|f}
\keeplig{Hoffranz}  % Hoffranzen (?)         \nolig{tariff}{tarif|f}
                                              % (viele Fälle!)
\nolig{Golff}{Golf|f}                        \nolig{Tieff}{Tief|f}
\nolig{golff}{golf|f}                        \nolig{tieff}{tief|f}
 % (viele Fälle!)                             % (viele Fälle!)
\nolig{Hoffern}{Hof|fern}                    \keeplig{tieffekt}
\nolig{hoffern}{hof|fern}                      % Multieffekt Konfettieffekt
 % Hofferne hofferner                        \keeplig{tieffiz}
\nolig{Hoffest}{Hof|fest}                      % Antieffizienz
 % Hoffest Hoffesterlös Hoffestteam
\nolig{Impff}{Impf|f}
 % Impffurcht Impffortbildung                \nolig{chaffron}{chaf|fron}
\nolig{Kampff}{Kampf|f}                        % Schaffron
\nolig{kampff}{kampf|f}                       \nolig{eiffest}{eif|fest}
 % kampffertig Kampffigur                      % reiffest
 % Kampffuchs Kampffüchse
\nolig{Kopff[aäeoöruü]]}{Kopf|f}             \nolig{ffabrik}{f|fabrik}
\nolig{kopff[aäeoöruü]]}{kopf|f}              % Strumpffabrik
 % (viele Fälle!)                            \nolig{ffacet}{f|facet}
 % [kK]opffi -> caught by pffi rule           % Relieffacetten
 % [kK]opffl -> caught by pffl rule          \nolig{ffachl}{f|fachl}
\nolig{Klopff}{Klopf|f}                       % beruffachlich golffachlich
\nolig{klopff}{klopf|f}                      \nolig{ffachm}{f|fachm}
 % Schenkelklopffrohsinn klopffrei            % Huffachmann Wahlkampffachmann
\nolig{Prüff}{Prüf|f}                         % Golffachmesse Fünffachmord
\nolig{prüff}{prüf|f}                        \nolig{ffäch}{f|fäch}
 % (viele Fälle!)                             % Brieffächer Einwurffächer fünffächrig
\nolig{Ruffach}{Ruf|fach}                    \nolig{ffaden}{f|faden}
 % Ruffach                                    % Einzelknopffaden Knüpffaden
\nolig{ruffach}{ruf|fach}                    \nolig{ffäd}{f|fäd}
 % Hausnotruffachberater beruffachlichen      % Einzelknopfäden Tropffäden
\nolig{Rumpff}{Rumpf|f}                      \nolig{ffähig}{f|fähig}
 % Rumpffassung                               % hoffähig kampffähig lauffähig
\nolig{Schaffang}{Schaf|fang}                \nolig{ffahn}{f|fahn}
\nolig{Schaffarm}{Schaf|farm}                 % Totenkopffahne Dorffahne Wahlkampffahnen
                                             \nolig{ffahr}{f|fahr}
\nolig{Schilff}{Schilf|f}                     % Schifffahrt Schleiffahrt Tariffahrplan
\nolig{schilff}{schilf|f}                    \nolig{ffähr}{f|fähr}
 % Schilffeld Schilfflöte Schilffloß          % Dampffährdienst
\nolig{Senff}{Senf|f}                        \nolig{ffaktor}{f|faktor}
\nolig{senffa}{senf|fa}                       % Hoffaktor Schlupffaktoren
 % Senffabrik senffarbig Senffleck           \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}

% Abruffernsehen
\nolig{ffertig}{f|fertig}
% schlaffertig
\nolig{ffestl}{f|festl}
% Straffestlegung
\nolig{ffests}{f|fests}
% Straffestsetzung
% Hoffestspiele Dorffestspiel
\nolig{ffetisch}{f|fetisch}
% Schaffetischisten
\nolig{ffetus}{f|fetus}
% Schaffetus
\nolig{ffett}{f|fett}
% Huffett Rumpffett Scharffetter
\keeplig{Buffett} % Buffettheke
\keeplig{Büffett}
\keeplig{buffett}
\keeplig{büffett} % Obstbüffett
\nolig{ffetz}{f|fetz}
% Brieffetzen Stofffetzen
\keeplig{Buffetz} % Buffetzeit
\keeplig{Büffetz} % Büffetzusammenstellung
\nolig{ffeud}{f|feud}
% Kasernenhoffeudalismus
\nolig{ffeue}{f|feue}
% Dorffeuerwehr Torffeuer Lauffeuer

\nolig{ffilet}{f|filet}
% Meerwolffilet
\nolig{ffindung}{f|findung}
% Beruffindungsprozess
\nolig{ffirm}{f|firm}
% Brieffirmen Tariffirmen
\keeplig{affirm}
\keeplig{Affirm}

\nolig{ffolg}{f|folg}
% Impffolgen
\nolig{ffoli}{f|foli}
% Relieffolien
\nolig{ffolter}{f|folter}
% Tropffolter
\keeplig{Affoltern} % town near Zurich
\nolig{ffond}{f|fond}
% Tariffondslösung
\nolig{fforder}{f|forder}

% Tarifforderung Strafforderung
\nolig{fförder}{f|förder}
% ruffördernd kreislauffördernd schlaffördernd
\nolig{fforell}{f|forell}
% Werfforellen
\nolig{fform}{f|form}
% Kopfform Gugelhupfform aufformen
\nolig{fförm}{f|förm}
% reifförmig schweifförmig
\nolig{fforsch}{f|forsch}
% Schlafforschung Impfforschung
\nolig{fforen}{f|foren}
% Abrufforen
\nolig{fforu}{f|foru}
% Schlafforum
\nolig{ffoto}{f|foto}
% Schlaffotogalerie
\nolig{fföt}{f|föt}
% Wolffötus

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

\nolig{ffreak}{f|freak}
% Surffreak
\keeplig{toffreak} % Schadstoffreaktionen
\nolig{ffregat}{f|fregat}
% Kampffregatte Dampffregatte
\nolig{ffrei}{f|frei}

```
% tariffrei Schlaffrei                              \nolig{ffühl}{f|fühl}
 \keeplig{chiffrei}% Schiffreise                      % Scharffühler
 \keeplig{toffrei} % stoffrein sauerstoffreich      \nolig{ffüll}{f|füll}
 \keeplig{uffreis} % Puffreis                         % Prüffüllgut Dampffüllung
 \keeplig{luffrei} % schluffreich                   \nolig{ffürst}{f|fürst}
 \keeplig{iffreig} % Riffreigen                       % -f-fürst
\nolig{ffremd}{f|fremd}                             \nolig{ffuß}{f|fuß}
 % hoffremd                                         \nolig{ffuss}{f|fuss}
\nolig{ffreq}{f|freq}                               \nolig{ffüß}{f|füß}
 % Schlaffrequenz                                   \nolig{ffüss}{f|füss}
\nolig{ffreu}{f|freu}                                % Greiffuß Greiffüße
 % Straffreude Brieffreund                           \keeplig{iffuss}
                                                      % Diffusschall -strahlung
\nolig{ffrisch}{f|frisch}                           \nolig{ffutter}{f|futter}
 % Schaffrischkäse zapffrisch                        % Prüffutter
\nolig{ffried}{f|fried}                             \nolig{ffütter}{f|fütter}
 % Dorffrieden Hoffrieden                            % Abruffütterung
\nolig{ffries}{f|fries}
 % Relieffries                                      \nolig{hoffan}{hof|fan}
 \keeplig{toffries} % Rohstoffriese                  % Waldhoffan
\nolig{ffrist}{f|frist}                             \nolig{hoffersch}{hof|fersch}
 % Prüffrist Ablauffrist                             % Talhofferschen
\nolig{ffrisur}{f|frisur}                           \nolig{hoffest}{hof|fest}
 % Schlaffrisur Topffrisur Zopffrisur                % Pfarrhoffest Hinterhoffest
                                                    \nolig{hoffete}{hof|fete}
\nolig{ffront}{f|front}                              % Schneckenhoffete
 % Hoffront Kampffront
 \keeplig{affront}                                  \nolig{lffach}{lf|fach}
 \keeplig{Affront}                                   % elffach zwölffach
\nolig{ffrosch}{f|frosch}
 % Pfeiffrosch                                      \nolig{offegen}{of|fegen}
\nolig{ffrösch}{f|frösch}                            % Hoffegen
 % Pfeiffrösche
\nolig{ffrucht}{f|frucht}                           \nolig{pffach}{pf|fach}
 % Rumtopffrucht                                     % Strumpffach
\nolig{ffrücht}{f|frücht}                           \nolig{pffern}{pf|fern}
 % Rumtopffrüchte                                    % rumpffern
                                                    \nolig{pffest}{pf|fest}
\nolig{ffund}{f|fund}                                % Klopffestigkeit tropffester
 % Brückenkopffundament                             \nolig{pffels}{pf|fels}
 \keeplig{iffund} % diffundieren                     % Hirschkopffelsen
 \keeplig{toffund} % stoffundurchlässig             \nolig{pffont}{pf|font}
\nolig{fführ}{f|führ}                                % Dampffontäne
 % Kampffführung aufführen                          \nolig{pffüh}{pf|füh}
\nolig{ffunk}{f|funk}                                % Kampfführung
 % Brieffunktion Abruffunktion
```

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

\nolig{straffern}{straf|fern}
 \keeplig{rtstraffern} % Gurtstraffern
 \keeplig{ssstraffern}
  % Gurtschlossstraffern

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

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


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

\nolig{Aufi}{Auf|i}
\nolig{aufinstr}{auf|instr}
 % aufinstruieren
\nolig{aufirr}{auf|irr}
 % hinaufirrte
\nolig{aufisst}{auf|isst}

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

\nolig{Chefi}{Chef|i}
\nolig{chefi}{chef|i}
 % Chefideologe Chefindianer
 % Chefinformatiker
 \keeplig{Chefin} % Chefin Chefinnen

 \nolig{Chefin[a-mo-z]}{Chef|in}
 % Chefinder -indianer -inspektor
 % -inquisitor
\keeplig{chefin}
  \nolig{chefind}{chef|ind}
\keeplig{chefibel} % Recherchefibel
\keeplig{chefiebe} % Recherchefieber
\keeplig{chefigur} % Nietzschefigur
\keeplig{chefilm} % Rachefilm
\keeplig{chefili} % Wäschefiliale
\keeplig{chefirm} % Geldwäschefirma
\keeplig{chefisch} % Wäschefische

\nolig{Dorfi}{Dorf|i}
\nolig{dorfi}{dorf|i}
 % Dorfidylle -information -institute
\nolig{Hofi}{Hof|i}
 % (viele Fälle!)
 \keeplig{Hofier} % Hofieren
\nolig{Kampfi}{Kampf|i}
\nolig{kampfi}{kampf|i}
 % Kampfideologie Kampfinstrument
\nolig{Kaufi}{Kauf|i}
\nolig{kaufi}{kauf|i}
 % Kaufidee kaufinteressiert Kaufimpuls
\nolig{Laufi}{Lauf|i}
\nolig{laufi}{lauf|i}
 % Laufidol Kreislaufinsuffizienz
 \keeplig{Laufig}
 \keeplig{Blaufi}
  % Blaufichte Blaufilter Blaufisch
 \keeplig{laufilter} % Planetenblaufilter
 \keeplig{laufiedr} % blaufiedrig
\nolig{rüfi}{rüf|i}
 % Prüfinhalt Prüfinstitution Prüfintervall
\nolig{Rumpfi}{Rumpf|i}
\nolig{rumpfi}{rumpf|i}
 % Rumpfitalien Strumpfindustrie
 \keeplig{rumpfig}

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

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

\nolig{fidee}{f|idee}
 % Kopfidee Luftschiffidee
\nolig{fideol}{f|ideol}
 % Tiefideologie
\nolig{fidentif}{f|identif}
 % Stoffidentifizierung
\nolig{fidentit}{f|identit}
 % Steppenwolfidentität Berufidentität
\nolig{fidol}{f|idol}
 % Golfidol
\nolig{fidyll}{f|idyll}
 % Bauernhofidyll
\nolig{figel}{f|igel}
 % Köpfigel Stoffigel
 \keeplig{figelehrt} % Sufigelehrter
\nolig{fikone}{f|ikone}
 % Laufikone
\nolig{fillus}{f|illus}
 % Sumpfillusion
\nolig{fimman}{f|imman}
 % ablaufimmanente
\nolig{fimmob}{f|immob}
 % Kaufhofimmobilie
\nolig{fimmun}{f|immun}
 % Strafimmunität
\nolig{fimp}{f|imp}
 % Torfimporte Kaufimpuls aufimpft

\nolig{findex}{f|index}
 % Kaufindex Pfandbriefindex
\nolig{findikat}{f|indikat}
 % Impfindikation
\nolig{findiv}{f|indiv}

 % Hofindividualität
\nolig{findiz}{f|indiz}
 % Tarifindizes
\nolig{findust}{f|indust}
 % Golfindustrie
\nolig{finfekt}{f|infekt}
 % Dampfinfektion
\nolig{finfiz}{f|infiz}
 % Laufinfizierte
\nolig{finfo}{f|info}
 % Tarifinformation Telefoninformation
 \keeplig{Delfinfo}
  % Delfinforscher -foto
\nolig{finfra}{f|infra}
 % Hofinfrastruktur
\nolig{finfus}{f|infus}
 % Tropfinfusion
\nolig{fingenieur}{f|ingenieur}
 % Prüfingenieur Kaufingenieur
\nolig{finhab}{f|inhab}
 % Hofinhaber
\nolig{finhalat}{f|inhalat}
 % Kamilledampfinhalationen
\nolig{finhalt}{f|inhalt}
 % Begriffinhalte Kropfinhalt
 \keeplig{Delfinhalt} % Delfinhaltung
 \keeplig{raffinhalt} % 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}
```

```
 % 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
 % eingriffintensiv                            \keeplig{auflüssig} % Tauflüssigkeit
```

45

```
\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 huflatticharticg
\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{Strafl}{Straf|l}
\nolig{Pfeifl}{Pfeif|l}                       \nolig{strafl}{straf|l}
\nolig{pfeifl}{pfeif|l}                        % lots and lots of words..
 % Pfeiflaute                                 \nolig{Strumpfl}{Strumpf|l}
\nolig{Prüfl}{Prüf|l}                          \nolig{strumpfl}{strumpf|l}
\nolig{prüfl}{prüf|l}                           % Strumpfladen Strumpfloch
 % Prüflabor Prüflast Prüflampe               \nolig{Sumpfl}{Sumpf|l}
\nolig{Reliefl}{Relief|l}                       % Sumpflabkraut -leiche -licht
\nolig{reliefl}{relief|l}
 % Relieflandschaft -lagen -landkarte         \nolig{Surfl}{Surf|l}
 % relieflos                                  \nolig{surfl}{surf|l}
\nolig{Rufl}{Ruf|l}                             % Surflizenz Surflegende
\nolig{rufl}{ruf|l}                            \keeplig{surfleck}% Lasurfleck
 % viele Fälle, aber...                        \keeplig{surflüg} % Klausurflügel
 \keeplig{Durufl}   % Duruflé                  \keeplig{surflüss}% Glasurflüssigkeit
 \keeplig{mbarufl}  % Gambarufluss            \nolig{Tarifl}{Tarif|l}
 \keeplig{ruflagge} % Peruflagge              \nolig{tarifl}{tarif|l}
 \keeplig{rufleisch} % Kängurufleisch          % lots and lots of words...
                                              \nolig{Tiefl}{Tief|l}
\nolig{Schafl}{Schaf|l}                        \nolig{tiefl}{tief|l}
\nolig{schafl}{schaf|l}                         % Tieflager stieflich
 % Schafleder Schaflaus Schafleber            \keeplig{tiefläche} % Garantieflächen
\nolig{Schiefl}{Schief|l}                      \keeplig{atieflaute}% Demokratieflaute
\nolig{schiefl}{schief|l}                      \keeplig{atieflut} % Bürokratieflut
 % schieflachen Schieflage schieflaufen
\nolig{Schilfl}{Schilf|l}                     \nolig{Topfl}{Topf|l}
\nolig{schilfl}{schilf|l}                      \nolig{topfl}{topf|l}
 % Schilflabyrinth Schilflieder                % Topflappen Topflumpen
\nolig{Schlafl}{Schlaf|l}                      \keeplig{Topflagg} % Topflaggen
\nolig{schlafl}{schlaf|l}                      \keeplig{Topflitz} % Topflitzer
 % lots and lots of words...                   \keeplig{Topflor}  % Topflor
\nolig{Schleifl}{Schleif|l}                    \keeplig{rtopfli}  % portopflichtig
\nolig{schleifl}{schleif|l}                    \keeplig{topfläch} % Biotopfläche
 % Schleiflack Schleiflade                     \keeplig{topfleg}  % Autopflege
\nolig{Schrumpfl}{Schrumpf|l}                   \nolig{rtopfleg}{rtopf|leg}
\nolig{schrumpfl}{schrumpf|l}                     % Schmortopflegen
 % Schrumpflack                                \keeplig{topflop}  % Megatopflop
                                               \keeplig{topflug}  % Nonstopflug
\nolig{Schweifl}{Schweif|l}                    \keeplig{topflüg}  % Nonstopflüge
\nolig{schweifl}{schweif|l}
 % Schweiflecken                              \nolig{Torfl}{Torf|l}
\nolig{Senfl}{Senf|l}                         \nolig{torfl}{torf|l}
 % Senfladen Senfliebhaber                     % Torflieferant Torfloch
\nolig{Steifl}{Steif|l}                        \keeplig{Torflagge}
\nolig{steifl}{steif|l}                        \keeplig{Torflügel}
 % steiflippig                                 \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
\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} % name of a famous font designer
\nolig{fleut}{f|leut}
 % Hofleute

\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
\nolig{flöhn}{f|löhn}
 % Tariflöhne
\nolig{flok}{f|lok}
 % Dampflokomotive
\nolig{flord}{f|lord}
 % Wolflord
\nolig{flösch}{f|lösch}
 % Hoflöschmaschine
\nolig{flösu}{f|lösu}
 % Schmierseiflösung

\nolig{fluft}{f|luft}
```

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

\nolig{Gipfle}{Gipf|le}
\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 Indigopflanzen
\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}
 \keeplig{Dreifl}
 \keeplig{dreifl}
 \keeplig{Freifl}
 \keeplig{freifl}
 \keeplig{eiereifl} % Meiereiflügel
```

```
\keeplig{reifläch} % Freiflächen
\keeplig{reiflagg} % Reedereiflagge
\keeplig{reiflamm} % dreiflammig
\keeplig{reiflasch}% Milchbreiflaschen
\keeplig{reiflies} % Fleischereifliesen
\keeplig{reiflock} % Breiflocken
\keeplig{reifloh} % Büchereiflohmarkt
\keeplig{reiflöhe} % Gießereiflöhe
\keeplig{reiflott} % Fischereiflotte

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

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

\nolig{wafle}{waf|le}
 % schwafle
\nolig{wefle}{wef|le}
 % schwefle
\nolig{weifle}{weif|le}
 % bezweifle verzweifle
 \keeplig{weifleck}  % zweifleckig
\nolig{werfl}{werf|l}
 % Wegwerflied
 \keeplig{chwerfl}
 % Schwerflugzeug schwerfließend
 \keeplig{werflitz} % Powerflitzer




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

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

\nolig{ffibel}{f|fibel}
 % Zwiebelknopffibeln
```

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

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

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

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

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

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

\nolig{reiffing}{reif|fing}
 % Greiffinger



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

```
\nolig{Stoffi}{Stoff|i}                    \nolig{fflatsch}{ff|latsch}
\nolig{stoffi}{stoff|i}                     % Rifflatschern
 % Rohstoffindustrieller -importe          \nolig{ffloch}{ff|loch}
 % Baustoffingenieur Kunststoffingenieur    % Suffloch Griffloch Sauerstoffloch
 % Kohlenstoffisotope                       \nolig{fflos}{ff|los}
 \keeplig{stoffiz}                          % auspufflos
 % Geheimdienstoffiziere
 \keeplig{stoffig}                         \nolig{ifflo}{iff|lo}
 % permit ffi ligature for ff-ig suffix     % Schifflogbuch grifflos Griffloch

\nolig{ffinnen}{ff|innen}                  \nolig{offlad}{off|lad}
 % Schiffinnenraum Schiffinnenausbau        % Sprengstoffladung
                                           \nolig{öffle}{öff|le}
                                            % löffle
% 6. ffl -> ff-l                           \nolig{offlo}{off|lo}
% --------------                            % wirkstofflos Sauerstoffloch
                                            % offload
\nolig{Griffl}{Griff|l}
\nolig{griffl}{griff|l}                    \nolig{pufflack}{puff|lack}
 % Grifflängen -laschen -leiste             % Auspufflack
 % grifflos angrifflustig
\nolig{Offline}{Off|line}                  \nolig{taffle}{taff|le}
\nolig{offline}{off|line}                   % staffle
 % offline, Offline
\nolig{Pfiffl}{Pfiff|l}                    \nolig{ufflad}{uff|lad}
 % Pfifflaute                               % Suffladen
\nolig{Scheffle}{Scheff|le}                \nolig{uffläd}{uff|läd}
\nolig{scheffle}{scheff|le}                 % Suffläden
 % Scheffler Geldscheffler                  \nolig{luffleck}{luff|leck}
\nolig{Schiffl}{Schiff|l}                   % Bluffleck
\nolig{schiffl}{schiff|l}                  \nolig{üffle}{üff|le}
 % Schifflache Schiffladung Schifflinie     % schnüffle büffle trüffle
\nolig{Stoffl}{Stoff|l}                    \nolig{ufflon}{uff|lon}
\nolig{stoffl}{stoff|l}                     % Mufflon
 % lots of words...
\nolig{Treffl}{Treff|l}
\nolig{treffl}{treff|l}
 % Trefflokal                              % 7. ffl -> f-fl
                                           % --------------
\nolig{afflu}{aff|lu}
 % Gafflust                                \nolig{Auffl}{Auf|fl}
                                           \nolig{auffl}{auf|fl}
\nolig{fflamell}{ff|lamell}                 % aufflackern aufflammen Aufflickung
 % Rafflamellen                             % Auffliegen
\nolig{fflast}{ff|last}
 % Rohstofflastigkeit Treibstofflaster     \nolig{eiffleck}{eif|fleck}
```

```
 % Schleiffflecklein                          % Torffladen
                                            \nolig{rfflasch}{rf|flasch}
\nolig{ffläch}{f|fläch}                       % Wegwerfflasche
 % Lauffläche Kampfflächen
 % Zwölfflächner zwölfflächig               \nolig{ufflot}{uff|lot}
\nolig{fflech}{f|flech}                       % Sufflot
 % aufflechten
\nolig{ffleisch}{f|fleisch}                  \nolig{wurfl}{wurf|l}
 % Schaffleisch Kopffleisch                   % Freiwurflinie Maulwurflobbyist
\nolig{fflexib}{f|flexib}
 % Tarifflexibilitat
\nolig{fflies}{f|flies}
 % Relieffliesen
\nolig{fflimm}{f|flimm}                     % 8. ft -> f-t
 % Vorhofflimmern                           % ------------
\nolig{ffluch}{f|fluch}
 % Tarifflucht Werwolffluch                 \if@noftligs
\nolig{fflüch}{f|flüch}                      \else % suppress them selectively...
 % Tarifflüchtling                           \nolig{Auft[aähioöruüy]}{Auf|t}
\nolig{fflug}{f|flug}                        \nolig{auft[aähioöruüy]}{auf|t}
 % Tiefflug Kampfflugzeug Chefflugleiter      % (viele viele Fälle; aber: ft-Ligatur wird
\nolig{fflüg}{f|flüg}                         % doch verwendet für "Auft.")
 % Streifflüge zwölfflügelig Tiefflüge
\nolig{fflur}{f|flur}                         \nolig{Brieft}{Brief|t}
   % Klosterhofflur                           \nolig{brieft}{brief|t}
\nolig{ffluss}{f|flus}                        % Brieftasche Brieftaube
   % Prüffluss                               \nolig{Cheft}{Chef|t}
\nolig{fflüs}{f|flüs}                         \nolig{cheft[a-z]}{chef|t}
 % Schleifflüsigkeit}                         % Cheftheoretiker Cheftrainer
\nolig{fflut}{f|flut}                         \keeplig{omicheft[ceg]}
 % Brieffluten Rückrufflut Anrufflut          \nolig{Dorft}{Dorf|t}
                                             \nolig{dorft}{dorf|t}
\nolig{iefflieg}{ief|flieg}                   % Dorftrottel -tratsch -tümpel
 % tieffliegend                              \nolig{Elfte}{Elf|te}
\nolig{iefflog}{ief|flog}                     \nolig{elfte}{elf|te}
 % tiefflog                                   % elfte elftens
                                             \keeplig{elfterfolg} % elfterfolgreichste
\nolig{lfflach}{lf|flach}
 % Zwölfflach                                \nolig{Fünft[aäeoöruy]}{Fünf|t} % Fünftagewoche ...
                                            \nolig{fünft[aäeoöruy]}{fünf|t} % fünftens...
\nolig{pffl}{pf|fl}                           \keeplig{fünfterfolg} % fünfterfolgreichste
 % Sumpffläche Sturzkampfflieger              \keeplig{Fünfterfolg}
 % Totenkopfflagge Impfflüssigkeit            \keeplig{fünftrang}  % fünftrangig
 \keeplig{Knoepffl} % Knoepffler              \keeplig{Fünftrang}
                                             \keeplig{fünftreich} % fünftreichste
\nolig{rfflad}{rf|flad}                       \keeplig{Fünftreich}
```

```
\keeplig{Fünftoper}  % Fünftoperation            % Surfthema Surftipp
\keeplig{Fünftrund}  % Fünftrunden              \nolig{Tarift}{Tarif|t}
\keeplig{Fünftäon}                               \nolig{tarift}{tarif|t}
\keeplig{fünftältest}                            % Tarifthemen Tariftabelle
\keeplig{Fünftältest}                            \nolig{Tieft}{Tief|t}
                                                 % Tieftänzer -träumen -tresor -tunnel
\nolig{Golft}{Golf|t}                            \nolig{Torft}{Torf|t}
\nolig{golft[hiruüy]}{golf|t}                    \nolig{torft}{torf|t}
% Golfträume -turnier -typ -talent               % Torftabletten Torftaucher Torftoilette
                                                 \nolig{Wurft}{Wurf|t}
\nolig{Greift[eio]}{Greif|t}                     \nolig{wurft}{wurf|t}
% Greiftest -tentakeln -tier -tor                % Wurftalent Wurftaler
\nolig{Hanft}{Hanf|t}
% Hanftaler Hanftau                              \nolig{fft[aähioöruüy]}{ff|t}
\nolig{Hoft[aäehioäruüy]}{Hof|t}                 % Stofftasche Sauerstofftank Stofftheorie
\nolig{hoft[aähioöruü]}{hof|t}                   % Stofftier Stofftiger Stofftischtuch
% Hoftor Klosterhoftor                           % Auspufftopf Kunststofftonne
                                                 % Stofftradition Stofftrennung
\nolig{Laufte}{Lauf|te}                          % Kunststofftube Stoffturnschuhe
% Lauftermin Lauftest Lauftext                   % Stofftäschchen Auspufftöpfe
\nolig{Prüft[aähioäruüy]}{Prüf|t}                % Kunststofftöpfe Kunststofftüten
\nolig{prüft[aähioöruü]}{prüf|t}
% Prüftheorie                                    %% Words that start with a capital letter
\nolig{Ruft[aäehioäruüy]}{Ruf|t}                 %%  and end in f-test
% Ruftaxi Rufterz Rufton Ruftöne                 \nolig{Abstreiftest}{Abstreif|test}
                                                 \nolig{Ankauftest}{Ankauf|test}
\nolig{Schaftal}{Schaf|tal}                      \nolig{Hörprüftest}{Hörprüf|test}
\nolig{Schaftor}{Schaf|tor}                      \nolig{Hüpftest}{Hüpf|test}
\nolig{Schaftreib}{Schaf|treib}                  \nolig{Impftest}{Impf|test}
                                                 \nolig{Kauftest}{Kauf|test}
\nolig{Schlaft}{Schlaf|t}                        \nolig{Klopftest}{Klopf|test}
\nolig{schlaft[aähioäruüy]}{schlaf|t}            \nolig{Kneiftest}{Kneif|test}
% Schlaftablette                                 \nolig{Lichtschweiftest}{Lichtschweif|test}
\nolig{Schilft[äehiruüy]}{Schilf|t}              \nolig{Rückruftest}{Rückruf|test}
\nolig{schilft[hiruüy]}{schilf|t}                \nolig{Schnupftest}{Schnupf|test}
% Schilfteich Schlilftümpel                      \nolig{Sumpftest}{Sumpf|test}
\nolig{Senft[aäehioäruy]}{Senf|t}                \nolig{Tropftest}{Tropf|test}
% Senftube                                       \nolig{Wettkampftest}{Wettkampf|test}
\keeplig{Senftenberg}                            \nolig{tofftest}{toff|test}
\nolig{Straft[aähioöruüy]}{Straf|t}              % Impfstofftest Treibstofftests
\nolig{straft[aähioöruüy]}{straf|t}
% (viele Fälle)                                  \nolig{aftee}{af|tee}
\keeplig{straftheit} % Unbestraftheit            % Schlaftee
\nolig{Sufft}{Suff|t}                            \nolig{auftee}{auf|tee}
% Sufftest Sufftext                              % Kreislauftee
\nolig{Surft[ähiöüy]}{Surf|t}                    \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                      % Wolftürme
 \keeplig{ufträume} % Lufträumen
\nolig{ftrauri}{f|traurig}                      \nolig{ftyp}{f|typ}
 % tieftraurig                                   % Schifftyp Stofftyp waldorftypisch
\nolig{ftreff}{f|treff}                         \nolig{ftyr}{f|tyr}
 % Notruftreffen                                 % Dorftyrann Hoftyrann
\nolig{ftresor}{f|tresor}                       \nolig{ftwist}{f|twist}
 % Tieftresor                                    % Kopftwister
 \keeplig{ftresorp} % Luftresorption
\nolig{ftret}{f|tret}                           \nolig{graftum}{graf|tum}
 % Mieftreter                                    % Burggraftum Markgraftum
 \keeplig{ftrett} % Luftrettungsdienst          \nolig{graftüm}{graf|tüm}
 \keeplig{ftreturn}% Softreturn                   % Markgraftümer
\nolig{ftrick}{f|trick}
 % Rückruftricks                                 \nolig{hoftest}{hof|test}
\nolig{ftrieb}{f|trieb}                          % Schlachthoftest
 % auftriebte schaftriebig
\nolig{ftrief}{f|trief}                         \nolig{iefta}{ief|ta}
 % tieftriefend                                   % Tieftaucher Brieftasche Brieftaube
\nolig{ftrift}{f|trift}                         \nolig{iefto}{ief|to}
 % schaftriftig Schaftrift                        % Stieftochter Tiefton
\nolig{ftrimest}{f|trimest}                     \nolig{ieftö}{ief|tö}
 % fünftrimestrig zwölftrimestrig                 % Stieftöchter tieftönend
\nolig{ftritt}{f|tritt}                         \nolig{ieftra}{ief|tra}
 % Huftritte                                      % Tieftraumphase
 \keeplig{ftritter} % Kernkraftritter
 \keeplig{Luftritt}                             \nolig{lfta}{lf|ta}
\nolig{ftrott}{f|trott}                          % elftausend zwölftausend Golftasche
 % Sauftrottel                                   \nolig{lfto}{lf|to}
                                                 % Zwölftonmusik Elftonner Golftour
\nolig{ftrüb}{f|trüb}                           \nolig{lftö}{lf|tö}
 % tieftrübe                                      % zwölftönend
\nolig{ftrunk}{f|trunk}                         \nolig{lftum}{lf|tum}
 % schlaftrunken                                  % Werwolftum
\nolig{ftrupp}{f|trupp}
 % Prüftruppe                                    \nolig{nftü}{nf|tü}
                                                 % fünftürig Senftüte
\nolig{ftuch}{f|tuch}                            \keeplig{nftüb}
 % Schnieftuch Kopftuch                           % Vernunftüberlegung zunftüblich
\nolig{ftüch}{f|tüch}                             \nolig{nftübchen}{nf|tübchen}
 % Schnieftücher                                    % Senftübchen
\nolig{ftürk}{f|türk}
 % tieftürkis                                    \nolig{ölfte}{ölf|te}
\nolig{fturm}{f|turm}                            % zwölfte zwölftens
 % Wolfturm
\nolig{ftürm}{f|türm}                           \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      \keeplig{Eefje} % Dutch first name
% *non-German* (e.g., Nordic and Slavic)         \keeplig{Astafjew}
% origin for which the 'fj' ligature should        % Author (Wiktor) and soccer player (Maksim)
% not be suppressed. Use \keeplig macros to
% treat such cases.
\keeplig{fjord} % Norwegian
\keeplig{fjör} % Icelandic, e.g.,               % 11. fff -> ff-f
        % Isafjördur and Ísafjörður              % ---------------
\keeplig{Ísafjarðarbær} % city in Iceland          % Just in case there's a font that
\keeplig{fjell} % Norwegian                        % features a triple-f ligature:
\keeplig{fjall} % Swedish (?)
\keeplig{fjäll}                                  \nolig{fff}{ff|f}
\keeplig{fjöll}                                    % grifffest Stofffarbe Schifffahrt

\keeplig{Prokofjew}                                % This macro will also break up any 'fffl'
\keeplig{Sufjan} % Stevens                         % ligatures into 'ff' and 'fl' parts.
                                                   % Examples: Sauerstoffflasche Stofffleck
                                                   %       Schliffläche Kunststoffflügel
```

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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{0.250}
\def\selnoligpackagedate{2013/06/30}


% Announce who we are. Issue warning message if we're
% not running under LuaLaTeX.

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

\RequirePackage{ifluatex}

\ifluatex
 \RequirePackage{luatexbase,luacode,expl3}
\else
 \typeout{ ===================================== }
 \typeout{   WARNING  WARNING   WARNING    }
 \typeout{ ------------------------------------- }
 \typeout{ The ligature suppression macros of the }
 \typeout{ selnolig package *require* LuaLaTeX.  }
 \typeout{ Because you're NOT running this package }
 \typeout{ under LuaLaTeX, ligature suppression  }
 \typeout{ *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 override this "basic" setting:
% - broadf  Many more non-ligation rules for f-ligatures,
%       incl. fb, fh, fj, and fk character pairs.
% - hdlig   Additional ligature suppression rules for
%       'historic' and/or 'discretionary' ligatures,
%       e.g., ct, sp, st, sk, th, as, is, us, fr,
%       ll, et, at, and ta.

\newif\if@broadfset\@broadfsetfalse
\DeclareOption{broadf}{\@broadfsettrue}

\newif\if@hdligset\@hdligsetfalse
\DeclareOption{hdlig}{\@hdligsettrue}


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

\newif\if@addlhyph\@addlhyphtrue
\DeclareOption{noadditionalhyphenationpatterns}{\@addlhyphfalse}


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

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


% The option 'noftligs' serves to suppress ft and fft
```

```
% ligatures *globally*; default value: 'false'.

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



% 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



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

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

 % Commands to switch selnolig's routines on and off
 \newcommand\selnoligon{%
  \directlua{ enableselnolig() }%
 }

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

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


 % Record operations of selnolig package to the log
 % file: Enabled via '\debugon' command
 \newcommand\debugon{%
   \directlua{ debug=true }
```

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


% The 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) }%
}


\else
 % If *not* running under LuaLaTeX, provide dummy
 % definitions for package's user macros.
 \newcommand{\nolig}[2]{}
 \newcommand{\keeplig}[1]{}
 \newcommand{\uselig}[1]{\mbox{#1}}
 \let\selnoligon\relax
 \let\selnoligoff\relax
 \let\debugon\relax
 \let\debugoff\relax
\fi


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

```latex
% (It's defined outside the \ifluatex conditional since
% it doesn't use any lua code.)

\newcommand\breaklig{\-{\hspace{0pt}}}



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

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

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



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

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

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



% Part 5: What to do if 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 by 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   = "0.250",
  date      = "2013/06/30",
  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') --
local whatsit = node.id("whatsit") --

local userdefined

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

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

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

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

local 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

function process_ligatures(nodes,tail)
 if not suppression_on then
  return -- suppression disabled
 end

 local s={}
 local current_node=nodes
```

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

```lua
   local throwliga={}
   for k,v in pairs (noliga) do
    local count=1
    local match = string.find(f,k)
    while match do
     count   = match
     keep    = false
     debug_k1 = ""
     for k1,v1 in pairs (keepliga) do
      if v1 and string.find(f,k1) and string.find(k1,k) then
       debug_k1=k1
       keep=true
       break
      end
     end
     if not keep then
      debug_info("pattern match: ".. f .." - "..k)
      local n = match + string.len(k) - 1
      table.insert(throwliga,{prefix_length(f,match),n,k})
     else
      debug_info("pattern match nolig and keeplig: "..f .." - "..k.." - "..debug_k1)
     end
     match= string.find(f,k,count+1)
    end
   end
   if #throwliga==0 then
   -- debug_info("No ligature suppression for: "..f)
   else
    debug_info("Do ligature suppression for: "..f)
    local ligabreaks = build_liga_table(f:len(),throwliga)
    apply_ligatures(current_node,ligabreaks)
   end
   s = {}
   current_node = t
  end
 end
end -- end of function process_ligatures(nodes,tail)

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

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

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

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

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

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

```
% !TEX TS-program = lualatex
% selnolig-bugreport.tex, 2013/06/30

\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}
```