The selnolig package:
Selective suppression of typographic ligatures*

Mico Loretan†

2015/10/26

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, e.g., TeXLive 2013 and MiKTeX 2.9.

Contents

1 Introduction ......................................................... 1
2 I’m in a hurry! How do I start using this package? ................... 3
  2.1 How do I load the selnolig package? ............................ 3
  2.2 Any hints on how to get started with LuaLATEX? ................ 4
  2.3 Anything else I need to do or know? ............................ 5
3 The selnolig package’s approach to breaking up ligatures ............ 6
  3.1 Free, derivational, and inflectional morphemes .................. 6

*Current version: 0.3.0. Features of the selnolig package are subject to change without prior notice.

†loretan dot mico at gmail dot com.
1 Introduction

The ability of \TeX{} and Friends to use typographic ligatures has long been cherished by its users. Indeed, the automated and transparent use of typographic ligatures by \TeX{} and Friends is often 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 \TeX{}book observes, on page 19, that the word \texttt{shelfful} may look better if it is typeset as “shelfful”, i.e., \texttt{without} the \texttt{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 meaning-bearing particles or \textit{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. The main purpose of the \texttt{sectionlig} 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 \texttt{ff}, \texttt{fi}, \texttt{fl} etc. character pairs that span 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 such ligatures has the potential to impair seriously the intelligibility of the composite words.

\TeX{} and Friends offer several methods for suppressing ligatures on a case-by-case basis. In \LaTeX{}, there are three basic methods for suppressing ligatures: (i) insertion of an “empty atom”, \texttt{()}, between the characters whose ligature should be avoided; (ii) insertion of an explicit italic correction, \texttt{\sl}; and (iii) insertion of an explicit “kern”, e.g., \texttt{\kern0pt} or \texttt{\hspace0pt}.\footnote{Note, though, that the first ligature suppression method, \texttt{()}, does \textit{not} work if the document is compiled with Lua\LaTeX{}, and that the italic-correction method can produce inferior results if the text is being typeset in, well, the italic font shape.} The \texttt{babel} package, when used with the \texttt{ngerman} or \texttt{german} options, offers the “shortcut” macro \texttt{\|} to suppress ligatures. A drawback of these ligature suppression methods is that they 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 ligatures should be suppressed will be overlooked in the editing process.

There are also several preprocessor-type packages and scripts—I mention \texttt{rmligs} and \texttt{Ligatures-German} in \textit{Section 7} below, but others exist as well—that scan the input file(s) and insert marks (usually, but not necessarily, the \texttt{babel} \texttt{\|} shortcuts) in the places where ligatures should be avoided. While ingenious, these preprocessor-based solutions suffer from several drawbacks which, taken together, may help explain
why they do not appear to be in widespread use despite their usefulness. First, they add complexity to the
document preparation process. E.g., if the document is being edited inside an IDE or integrated development
environment, the input files have to be closed prior to running the preprocessor scripts on them; then the
files have to be re-opened in order to recompile them. Second, the presence of "|" macros in the input may
interfere with the work of programs such as spell checkers. Third, afaict none of the ligature-suppressing
preprocessor packages I’m familiar with have been written to handle ligature suppression for English
language texts. Fourth, their scope generally seems to be limited to the most basic f-ligatures (ff, fi, fl, ffi, and
ffl), making them less than fully useful for fonts that provide further f-ligatures, such as ft and fff, or “rare”
ligatures such as ð and ðp. Fifth, they usually require access to auxiliary programs (e.g., a unix environment
and a perl distribution in the case of the rmligs package) that need not be present on a given user's computer.

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

The selnolig package provides rules to suppress selectively the following f-ligatures, for both English and
German documents: ff, fi, fl, ffi, and ffl—the “standard” f-ligatures that should be familiar to most users of
Computer Modern fonts—as well as the ft and fff 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. Oldstyle-type font families generally feature a great variety of typographic
ligatures. Given the beauty and growing popularity of these font families, it’s important to be able to make
good use of many of their features, including the presence of ligatures outside the “basic five” set.

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

For English documents, the selnolig package recognizes two further options, broadf and hdlig. If
broadf is set, additional f-ligatures will be suppressed selectively. If hdlig option is set, selective ligature
suppression is performed on discretionary/rare ligatures such as ct, ðt, ðp, ðk, ðh, at, et, ðl, as, et, is, and us. No
rules are currently provided to suppress historic and/or discretionary/rare ligatures for German documents. 3

2 In some oldstyle font families, the ligatures “ft” and “fft” are rendered as “ft” and “fft”, respectively.
3 A quick remark on the classification of typographic ligatures. The f-ligatures are generally called “common” in most families.
Beyond this group, though, there appears to be little or no standardization across Opentype fonts as to which typographic ligatures
should be labelled “historic” and which ones should be labelled “discretionary”/”rare”. For instance, the fonts Latin Modern Roman,
Garamond Premier Pro, and Hoefler Text report having “only” discretionary ligatures. In contrast, the fonts Junicode, Cardo, EB
Garamond, and Palatino Linotype all report having both historic and discretionary ligatures. The name of the package option
hdlig is supposed to convey a sense of agnosticism as to how these non-common ligatures should be labelled.
Of course, no claim as to the completeness of either the English or German language list is or can be made. Hence, the selnolig package also makes it straightforward for users to provide their own, supplemental, ligature suppression rules to treat words that occur in their documents but aren't yet covered by the package. Please feel free to email me such words, so that I can augment and update the package's ligature suppression rules suitably. A suggested template for reporting issues with the selnolig package is provided in Appendix E.

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

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

Finally, in Appendix F I provide lists of ligature-containing words caught by selnolig's rules in two English-language and three German-language literary classics. The English pieces are Call of the Wild and The Sea Wolf, both by Jack London. The German pieces are Thomas Mann's Die Buddenbrooks and Goethe's Faust, both Part I and Part II. (Of course, I make no claim whatsoever as to any kind of statistical representativeness of this selection!) Unsurprisingly, the German pieces contain far more words for which ligatures are broken up by selnolig than do the English pieces.

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

2.1 How do I load the selnolig package?

• If your document is in English and you want to enable a "basic" set of rules to suppress f-ligatures selectively, load the package by issuing the following instruction in the preamble of your document:

\usepackage[english]{selnolig}

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

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

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

\usepackage[ngerman]{selnolig}
Synonymous language options are german, austrian, naustrian, swissgerman, and swiss.

- If you load the package without an explicit language option, i.e., as
  \usepackage{selnolig}

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

- If no language options are set either when the package is loaded or as options in the \documentclass instruction, you will need to provide your own ligature suppression rules. This approach is called for if you write in a language other than German or English—the only two languages currently supported by the selnolig package—and are able to devise your own ligature suppression rules using selnolig's \nolig{} and \keeplig{} macros.

2.2 Any hints on how to get started with \LaTeX{}?

The ligature suppression macros of the selnolig package require the use of \LaTeX{}; they will not work under either pdf\LaTeX{} or \XeLaTeX{}. If the selnolig package is not run under \LaTeX{}, a warning message will be issued and only the package's supplemental hyphenation rules will be available to the user.

If you've been using pdf\LaTeX{} until now, the requirement to use \LaTeX{} will likely force you to make some changes to your existing documents. Fortunately, these changes should be minor and straightforward to implement because \LaTeX{} is, for the most part, a strict superset of pdf\LaTeX{}. Almost all documents that compile correctly under pdf\LaTeX{} should also compile correctly under \LaTeX{}. The two most important changes you'll need to make are:

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

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

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

You will also need to use a \TeX{} distribution that features a fairly recent version of \LaTeX{}. \TeX{}Live 2013, \TeX{}Live 2012, and MiK\TeX{} 2.9 satisfy this requirement; versions of \TeX{}Live before 2011 probably do not.

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

```
luaplatex myfile
```

\footnote{If the selnolig package is run under \LaTeX{} but the fontspec package isn't loaded by the time the \begin{document} statement is encountered, selnolig will terminate with an error message.}
rather than either \texttt{latex myfile} or \texttt{pdflatex myfile} to initiate compilation. If you use a text editing program with pull-down menus or buttons to invoke a suitable compiler, be sure to select \texttt{LuaLaTeX}.

The very first time one runs \texttt{LuaLaTeX} on a document with a new set of fonts, the compilation speed will likely be quite slow because \texttt{LuaLaTeX} (actually, a package loaded by \texttt{LuaLaTeX}) has to create various cache files to store font-related information. Subsequent compilation runs should be much faster.

The answers to the questions entitled \textit{Frequently loaded packages: Differences between pdf\TeX\ and Lua\TeX?} and \textit{Using Lua\TeX\ as a replacement for pdf\TeX}, both posted to \texttt{tex.stackexchange.com}, provide lots of very useful information for people who are new to \texttt{LuaLaTeX} and are at least somewhat familiar with \texttt{pdf\TeX}. Another great resource for people who wish to become more familiar with \texttt{LuaLaTeX} is \textit{A Guide to LuaLaTeX} by Manuel Pégourié-Gonnard.

2.3 Anything else I need to do or know?

For multilingual support, \texttt{LuaLaTeX} and the \texttt{selnolig} package work well with the \texttt{babel} package. If you use the \texttt{babel} package, be sure to load \texttt{selnolig} \textit{after} \texttt{babel}; that way, the supplemental hyphenation patterns provided by the \texttt{selnolig} package won't get clobbered by \texttt{babel}'s hyphenation settings.\footnote{\texttt{The \texttt{selnolig} package is also compatible with the \texttt{hyphsubst} package (which, if used, should be loaded with a \texttt{\usepackage} statement \textit{before} the \texttt{\documentclass} instruction). Since mid-2013, one can also use the \texttt{polyglossia} package with \texttt{LuaLaTeX}.}

\texttt{LuaLaTeX} natively supports the so-called \texttt{UTF-8} input encoding scheme. In fact, \texttt{UTF-8} is also the \textit{only} input encoding scheme that \texttt{LuaLaTeX} knows about. Nowadays, many modern \TeX-aware editors support \texttt{UTF-8} directly; \texttt{LuaLaTeX} and \texttt{selnolig} should have no problems with \TeX files produced by these editors. Older files, however, may employ input encoding schemes incompatible with \texttt{UTF-8}. If your input files currently use a different input encoding scheme, e.g., \texttt{LATIN1}, they need to be converted to \texttt{UTF-8} before \texttt{LuaLaTeX} can process them properly. Several methods exist for changing a file's input encoding scheme. Please see the posting \textit{How to change a .tex file’s input encoding system (preferably to UTF-8)?} on \texttt{tex.stackexchange.com} for several possible conversion methods.

If your document is written in German, it is assumed that all vowels with diereses (Umlaute) are entered as \texttt{"a}, \texttt{"o}, \texttt{"u}, etc. rather than, say, as \texttt{"{a}}, \texttt{"{o}}, and \texttt{"{u}} or, if you tend to use the \texttt{babel} "shortcuts", as \texttt{a}, \texttt{o}, and \texttt{u}. Likewise, it's assumed that you enter the "eszett" ("scharfes s") character as \texttt{s} rather than as \texttt{ss}.\footnote{\texttt{TEXnically speaking, \texttt{selnolig} requires the use of \texttt{"a}, \texttt{"o}, \texttt{"u}, and \texttt{s} only in the search strings of the ligature suppression rules.}} It is also assumed that you use the triple-f (modern) spelling of words such as \texttt{Schiffahrt},\footnote{\texttt{The \texttt{selnolig} package's German language rules are set to recognize words containing the old-spelling version \texttt{schiffahrt}; the \texttt{ff} ligature is not broken up for these words. However, most other words that have two \texttt{f}'s in the old spelling and three \texttt{f}'s in the new spelling don't get any special treatment in the package.}} \texttt{Stofffarbe}, and \texttt{grifffest} and the double-t (modern) spelling of words such as \texttt{Mannschaftstest}.\footnote{\texttt{On my LuaLaTeX} system, whenever a \texttt{"|} command is encountered, I either get a bad crash that requires a reboot of the computer \texttt{(under Mac\TeX 2012)} or I get a stern error message about "Forbidden control sequence found while scanning use of \texttt{\FancyVerbGetVerb}" \texttt{(under Mac\TeX 2013).}}

Finally, all \texttt{babel}-style \texttt{"|} ligature-suppressing shortcuts should either be removed entirely or be replaced with \texttt{\breaklig} instructions; the \texttt{selnolig} package's \texttt{\breaklig} macro is explained in \textbf{Section 4.1.4}.\footnote{\texttt{The \texttt{selnolig} package is also compatible with the \texttt{hyphsubst} package (which, if used, should be loaded with a \texttt{\usepackage} statement \textit{before} the \texttt{\documentclass} instruction). Since mid-2013, one can also use the \texttt{polyglossia} package with \texttt{LuaLaTeX}.}}
3 The selnolig package’s approach to breaking up ligatures

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

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

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

Bound morphemes can be divided further into derivational and inflectional morphemes. A derivational morpheme changes the meaning of the associated free morpheme in a fundamental way. E.g., the “un” in “untrue” serves to create a word with the opposite meaning of the free morpheme “true”, and the “ful” in “shelfful” indicates the word is a quantity measure (“two shelffuls of books on typography”, say). An inflectional morpheme signifies a less fundamental change in meaning. In nouns (and, depending on the language, adjectives as well), inflectional morphemes can indicate plural forms (child vs. children, cat vs. cats) and other forms of declination.

In verbs, inflectional morphemes indicate conjugation, such as a change in tense of the verb. E.g., call vs. called, walk vs. walked, but also “swim” vs. “swims”, etc.

Words containing more than one morpheme can consist either of “just” free morphemes—rooftop, newspaper, etc.—or of free and bound morphemes joined together—untrue, shelfful, childish, laughs, etc. Bound morphemes generally occur either as prefixes or suffixes to the word’s “main part” or “stem” (the free morpheme). Prefixes almost invariably represent derivational morphemes (e.g., untrue, review, perform). Suffixes, in contrast, can consist of free, derivational, or inflectional morphemes. For instance, the suffixes 11ke and less in dwarflike and leafless are free morphemes, whereas the suffix ed in hounded and laughed is an inflectional morpheme.

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

---

9 Some examples of single-morpheme words containing a ligature are off, fit, flat, office, baffle, left, act, cost, and spin.
10 Some examples of single-morpheme words containing a ligature are off, fit, flat, office, baffle, left, act, cost, and spin.
11 Please don’t try to get me involved in a discussion of what it may mean to have words without meaning...

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

Because not all morpheme-spanning ligature are equally problematic in terms of their impact on a composite word’s readability, the `selnolig` package follows rules that leaves some ligatures untouched, while others are broken up. The package adopts the following broad principles: 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 that are explained below. Third, ligatures that span the boundary between a free morpheme and an inflectional morpheme are generally not suppressed. In Section 3.4 below, the third principle is shown to be particularly relevant for decisions related to the (non)suppression of *ft* and *fft* ligatures in certain German texts.

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

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

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

Should TeX need to hyphenate some of the words listed in the preceding paragraph to generate a well-typeset paragraph, it can of course do so—and break up the *ff* and *ft* ligatures in the process. There’s no need, though, to break up a ligature just because hyphenation *might* occur at that point. As always, there’s no meaningful rule without at least one exception; in “Interlude I” in Section 3.4 below, I discuss what *Duden* calls ambiguous cases for which ligature suppression follows syllable boundaries.

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

Typographic ligatures are suppressed if the following conditions apply to a word:

- if two free morphemes are joined: halfline → halfline, halflife → halflife, cufflink → cufflink, halftone → halftone, pastime → pastime, houndstooth → houndstooth, Charlestown → Charlestown, paintaking → paintaking, arctangent → arctangent, passport → passport, newspaper → newspaper, Hyannisport → Hyannisport, clothespin → clothespin, seawand → seawand, Catskills → Catskills, Peekskill → Peekskill, etc.

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

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

- if a main word is followed by a suffix beginning with f or l other than ly: shelfful → shelfful, leafless → leafless, dwarflike → dwarflike, leafflet → leafflet, soulless → soulless, seallike → seallike, etc.

  Note that the suffixes used above—ful[1], less, let, and lke—are all free morphemes. In contrast, the short suffix ly, if used to make adjectives into adverbs, is a derivational morpheme. The fl ligature is thus not broken up for words such as briefly and chiefly (unless the broadf option is set; see below).

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

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

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

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

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

  - ft ligatures in words such as fifty and fiftieth.

  The option broadf is not enabled by default. This is because I believe that any gains in readability that might result from breaking up the f-ligatures caught by the broadf rules are likely to be minor and aren’t worth running the serious risk of creating unsightly visual clashes caused by unligated fi, ffi, fl, and ffl glyphs. If the package’s hdlig option is set, an additional ligature-suppressing principle is activated:

  - The st and sp ligatures are also suppressed for words with Greek roots that contain the character triples sth and sph; examples: isthmus and atmosphere. Typesetting these words as isthmus and atmosphere, i.e., with the very distinctive looking st and sp ligatures, risks reducing their readability,

  11The relevant morpheme in the last two words in this list is k111 (from an old Dutch word for stream), not sk111.
because doing so would obscure the presence of the \( \theta / \vartheta \) and \( \phi / \varphi \) character pairs which derive from single Greek letters \( \theta / \vartheta \) and \( \phi / \varphi \), respectively. For these words, then, it seems advisable to suppress the \( st \) and \( sp \) ligatures even though, strictly speaking, no morpheme-crossing issues are involved.

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

### 3.4 Ligature suppression rules: German language case

For German words, the following rules apply when it comes to deciding which ligatures to break up and which ones to permit. 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. Examples: Schilfinsel \( \rightarrow \) Schilfinsel, Baustoffingenieur \( \rightarrow \) Baustoffingenieur, Wasserstoffionen \( \rightarrow \) Wasserstoffionen; Impffurcht \( \rightarrow \) Impffurcht, Senffabrik \( \rightarrow \) Senffabrik, Ablauflogik \( \rightarrow \) Ablauflogik, Schorflecken \( \rightarrow \) Schorflecken; Zwölfingerdarm \( \rightarrow \) Zwölfingerdarm; Brieftaube \( \rightarrow \) Brieftaube, elfteilig \( \rightarrow \) elfteilig, 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. By far the most common prefix that gives rise to the need to suppress various \( f \)-ligatures at the junction of a prefix and main word is the word “auf”, as in aufbrechen, auffassen, Aufführung, auffliegen, auffischen, aufhören, aufisst, aufjaulen, aufklingen, Auflage, Auftrag, auftreten, etc.

- **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 (bound morphemes) that start with an “\( f \)”, e.g., -fach and -fältig: The \( ff \)-ligature is suppressed. Examples: fünffach and zwölfältig.

  - **Case 3b**: Suffixes (bound morphemes) that start with an “\( i \)”, e.g., -ig, -in, and -isch: The \( fi \) and \( ffi \) ligatures are not suppressed. Examples: streifig, äffisch, Chefin, Chefinnen.

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

  - **Case 3c**: Suffixes that start with an “\( l \)”, e.g., -lich, -ling, -lein and -los: The \( fl \)-ligature is suppressed. Example words: trefflich, höflich, Prüfling, Köpflein, and straflos.

  - Interlude I: In ambiguous cases that could give rise to \( fl \)-ligatures that involve certain suffixes, according to Duden preference should be given to “how the syllables are pronounced and how a
word would be hyphenated”. For instance, *Duden* says that the fl-ligature should be suppressed in the words Verzweiflung, Bezweifler, schweflig, and würflig. ¹³

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

**Interlude II:** If a word *ends* with an f/l 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 the convention mentioned in the preceding paragraph may be extended to justify the use of the ff-ligature in the abbreviated word “Auf.” (full form: Aufführung—no ff ligature) and of the ft-ligature in “Auft.” (full form: Auftrag—no ft ligature).

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

**Case 3d:** Suffixes (derivational or inflectional morphemes) starting with t. Unfortunately, not much official wisdom seems to exist to guide this case, possibly because the ft and fft ligatures are not (yet?) used as widely as are the other f-ligatures. The following four rules, and especially the second one, should therefore be understood to be somewhat provisional.

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

¹³Note that the real suffixes in these words are ung, er, and ig—not lung, ler, and lig. Justifying the suppression of the fl-ligature for these words is thus not a simple matter of not letting a ligature span the “gap” between a main word and suffix. In my opinion, the rationale generally given for suppressing the fl-ligature in these cases—reliance on how the syllables are divided and how the composite words are hyphenated—is not entirely satisfactory. This is because, morphologically speaking, the main words Schwefel, Würfel, and Zweifel each contain two morphemes: a stem and the derivational morpheme el: Schwef|e|1, Würf|e|1, and Zweif|e|1. It is therefore not necessary, in my opinion, to create a new rule to justify the (non-)use of the fl-ligature for these cases. Given the presence of two morphemes in each of the main words, one could simply rely on the general rule of not letting ligatures span morpheme boundaries within the main words to motivate the suppression of the fl-ligature for words such as schweflig, würfle, and Verzweiflung, as their morphological components are schwefl[e]1 |1g, würf|e|1 e, and Ver|zweif|e|1 ung.

It’s fair to say, though, that most modern German speakers are only vaguely aware of the fact that the e1 particle constitutes a morpheme in words such as Würfel and Griffel—and that they are probably entirely unaware of this fact for words such as Schwefel and Zweifel. To be sure, the typographical convention adduced by *Duden* for suppressing the fl-ligature in words such as schweflig, Verzweiflung, and würfle does not appear to be based on the fact that letters f and l in these words belong to different morphemes.
* Should ft and fft ligatures be broken up in past tense and past-participle forms of verbs that do not end in ft but, instead, in -fte, -ften, -ftes, -ftest, etc? Example words: streifte, rafften, and schlürftest. Because these suffixes are “merely” inflectional rather than derivational morphemes, the selnolig package does not break up the ft and fft ligatures in these cases either. Thus, the words will be typset as streifte, schlürftest, and rafften rather than streifte, schlürftest, and rafften. 14

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

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

  - 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 that’s a bound morpheme. Example words: Saftladen, Säfte, Kraftfahrzeug, Luftagentur, duftend, bekräftigen, Haftung, and vernünftig. Because the ft character pair doesn’t cross a morpheme boundary, the selnolig package does not break up the ft ligature. Thus, the words are typeset as Saftladen, Säfte, Kraftfahrzeug, Luftagentur, duftend, bekräftigen, Haftung, and vernünftig. The fact that a syllable boundary occurs between the letters f and t in all of these words should not affect the decision whether or not to employ the ft (or fft) ligature.

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

## 4 Structure of the selnolig package

### 4.1 The main user commands

The four main user macros of the selnolig package are \nolig, \keeplig, \uselig, and \breaklig. The first two macros are meant to be used in the preamble to set up ligature-suppression rules on a document-wide

---

14I haven’t yet come across any kind of authoritative discussion of this specific case. Should someone be able to furnish a good counterargument to the setting proposed here, I would be happy to change the settings accordingly.
basis. The latter two may be used, as needed, within the body of the document on an *ad hoc* or case-by-case basis to either supplement or override rules set up by \texttt{\noilig} and \texttt{\keelilig} instructions.

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

## 4.1.1 The \noilig macro

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

\begin{verbatim}
\noilig{lfful}{lf|ful}
\end{verbatim}

sets up a rule to suppress the ff-ligature in words such as “shelfful”, “bookshelfful”, and “selffulfilling”.

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

It is also possible to use Lua-style wildcard characters in the search string, as long as the wildcard characters occur after the non-ligation point. For example, the file \texttt{selnolig-german-patterns.sty} sets up the rules

\begin{verbatim}
\noilig{Dorff[aäeiloöruü]}{Dorf|f}
\noilig{dorff[aäeiloöruü]}{dorf|f}
\end{verbatim}

to search for words that contain the strings Dorff and dorf followed by a letter in the set aäeiloöruü.

Incidentally, it is not strictly necessary, in the second argument of the \noilig command, to provide any material after the vertical bar that indicates the non-ligation point. However, the readability of your \noilig rules may suffer if you don’t list that material.

If you examine the \noilig rules provided in the files \texttt{selnolig-german-patterns.sty} and \texttt{selnolig-english-patterns.sty}, you’ll notice soon that there’s some redundancy built in, in the sense that some words’ ligatures will be broken up by more than one rule. For instance, the need to suppress the ff-ligature in “auffallen” happens to be met by both \noilig{auff}{auf|f} and \noilig{ffall}{f|fall}. This redundancy is deliberate, 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.

\footnote{TEXnically speaking, the \noilig macros perform their job by inserting special “whatsits” into the input stream whenever a pattern match occurs. These whatsits prevent the paragraph-building algorithm from replacing the affected character pairs (or triples) with corresponding ligatures. The package’s \texttt{\keeplig} macro, described below, works by removing any nonligation whatsits from the input stream whenever a pattern match occurs, thereby re-enabling the use of ligatures.}

\footnote{In case you’re curious: These particular, some complicated looking search strings are used to avoid suppressing the ff-ligatures in words that end in either Dorff or dorf, as would be the case with the surnames Dorff and Hausdorff.}
As with all \LaTeX\ instructions, the arguments of \texttt{\nolig}, \texttt{\keenlig}, and \texttt{\uselig} commands are case-sensitive.

4.1.2 The \texttt{\keenlig} macro

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

The \texttt{\keenlig} macro is very useful because it permits devising a (much) smaller set of broader, i.e., less restrictive, \texttt{\nolig} rules; any Type-II errors that may arise from having \texttt{\nolig} rules whose scope is too broad can be undone by providing judiciously crafted \texttt{\keenlig} rules.\footnote{In the present context, a Type-II error is the suppression of a ligature that is, in fact, valid for the word at hand.}

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

\[
\nolig{flich}{f|lich}
\]

to break up the fl-ligature in a multitude of words that end in the suffix \texttt{lich} (a derivational morpheme): begrifflich, beruflich, brieflich, glimpflich, hillflich, höflich, sträflich, tariflich, trefflich, unerschöpflich, and verwerflich, to name but just a few. This \texttt{\nolig} rule, incidentally, also (correctly) catches the word “Laufflicht”, which contains the free morphemes \texttt{lauf} and \texttt{licht}.

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

\[
\keenlig{flicht}
\]

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

It is important to be aware of the following fact: It is \textit{not necessarily} the case that ligatures contained in the argument of a \texttt{\keenlig} rule will be used in words that contain the rule’s search string. Why?! It is because, as was noted above, \textit{more than one} \texttt{\nolig} rule can apply to a given word. Consider, for instance, the word \texttt{Laufflicht} mentioned earlier. This word happens to be caught by two \texttt{\nolig} rules and one \texttt{\keenlig} rule provided in the file \texttt{selnolig-german-patterns.sty}:

\[
\begin{align*}
\nolig{aufl}{auf|l} \\
\nolig{flich}{f|lich} \\
\keenlig{flicht}
\end{align*}
\]
For the word Lauflicht, \keeplig{flicht} serves to undo the action of \nolig{flich}{f|lich}. However, because the string aufl is not a subset of the string flicht, \keeplig{flicht} does not undo the action of \nolig{aufl}{auf|l}. Hence, the word Lauflicht ends up being typeset—correctly!—as Lauflicht, i.e., without the fl-ligature.

Interestingly, the rule \keeplig{flicht} is itself a bit too broad because it improperly catches the composite noun Sumpflicht, for which the fl-ligature should in fact be suppressed. To address this case, the file selnolig-german-patterns.sty provides the rule \nolig{Sumpfl}{Sumpf|l}; for the word Sumpflicht, this \nolig rule is not overridden by the rule \keeplig{flicht}. This \nolig rule also serves to suppress the fl ligature in words such as Sumpflabkraut and Sumpfleiche.

4.1.3 The \uselig macro

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

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

4.1.4 The \breaklig macro

The macro \breaklig, which doesn’t take an argument, is provided as a hopefully easy-to-remember substitute for the lower-level \LaTeX command ”\hspace{0pt}”. You should insert this macro in places where you want to break up a ligature on an ad-hoc basis and also wish to permit hyphenation. To suppress a ligature on an ad-hoc basis without introducing a potential hyphenation point, insert the instruction ”\kern0pt”.

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

4.2 Components of the selnolig package

The selnolig package has the following components:

- The main “driver” file is called selnolig.sty. It sets up the package’s main user macros, \nolig, \keeplig, \uselig, and \breaklig, that were explained in detail in the preceding subsection and loads several other files.

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

- The ligature suppression rules for English and German language documents are contained in the files selnolig-english-patterns.sty and selnolig-english-patterns.sty, respectively.
• Supplemental hyphenation exception patterns, mostly for composite words that involve ligatures that are suppressed by the package’s \no1ig 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 \TeX\Live or MiK\TeX, you can access these files by typing \texttt{texdoc selnolig-english-test} or \texttt{texdoc selnolig-german-test} at a command prompt.

The “driver” file selnolig.sty starts by setting up several Boolean switches to structure the processing of options. It then loads the file selnolig.lua, which contains the package’s lua code and sets up the user macros discussed in the preceding subsection.

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

• If no language-specific options are in effect, the setup process terminates. Users may, of course, provide their own \no1ig, \keep1ig, \use1ig, and \break1ig instructions.

• 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 \no1ig and \keep1ig 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.

The following is an admittedly rough and rather imperfect indication of just how much more complex the task is of creating a set of ligature suppression rules for German than it is for English: As of the mid-May 2013 version of the selnolig package, the “basic” set of English language ligature suppression rules for
“common” f-ligatures consists of 32 \no11g and 17 \keepl11g directives. In contrast, the set of German language ligature suppression rules for “common” f-ligatures consists of roughly 700 \no11g and 335 \keepl11g directives. A ratio of roughly 1:20 in terms of detail and complexity!

5 Additional ligature-related matters

5.1 The noftl11gs 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 noftl11gs when loading the package. Doing so will make the package set up the simple rule \no11g(ft){f|t} rather than load many separate rules for suppressing ft ligatures selectively. You may also wish to specify the noftl11gs option if the font you use in your document doesn’t even feature ft and fft ligatures.

5.2 English language case: The broadf and hd11g options

The ligature suppression patterns for English language words, contained in the file selnolig-english-patterns.sty and listed in Appendix A below, are grouped into four parts. The first two parts concern the suppression of f-ligatures. Part 1 provides a fairly limited, or “basic”, set of patterns that will always be executed, and Part 2 contains a broader set of ligation suppression rules that will be executed if the broadf option is specified. As noted in Section 3.3 above, for English-language documents only the fairly limited number of f-ligature suppression rules contained in Part 1 of the file is enabled by default. This is done because eliminating the morpheme-crossing f-ligatures caught if the broadf option is set does not appear to be a major concern in English-language typography. There simply doesn’t appear to be a need to suppress the fi (ffi) ligature words that end in f (ff) followed by the particles -ing, -ish, -ier, -iest, -ily, and -iness. Any gain in readability resulting from suppressing these fi and fl ligatures would appear to be more than offset by unsightly visual clashes created by unligated fi, ffi, fl, and ffl combinations.

Part 3 of the file selnolig-english-patterns.sty, which is enabled if the hd11g option is set, provides ligature suppression rules for the ct, st, and sp ligatures. Examples are words such as arctangent (not: arc tangent), painstaking (not: painstaking), mistake (not: mištake), and trespass (not trespass).

Setting the hd11g 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 hd11g option set, these words will be typeset as lighthouse, pothole, aromatherapy, albatross, ninety, and nonetheless. Ligature suppression rules are provided for the following discretionary ligatures, which occur only in the italic font shape of the font families used in this document: th, at, et, as, is, us, ll, fr, and ſk. Part 3 of Appendix A lists these rules.

---

\footnotemark[18]Including the rules that are activated if the broadf and hd11g options are both activated, the tally rises to about 420 \no11g and 52 \keepl11g instructions.

\footnotemark[19]For German language documents in particular, suppressing ft and fft ligatures globally may help speed up compilation noticeably, as there will be roughly 180 \no11g and 60 \keepl11g instructions fewer to run on the document.
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 → fást and clasp → clas♣. Note that the issue being addressed in this part is not that of a ligature improperly spanning a morpheme boundary; instead, it is the possibility that TEX might pre-empt one typographic ligature with another ligature within one and the same morpheme. This issue is discussed in more detail in Section 5.6 below.

5.3 Composite words with ambiguous morphology

Some composite words can be made up of two different morpheme pairs, or even morpheme triples. For instance, the German words Saufladen and Wachstube may be constructed as Saufladēn/Saufladen and as Wachstube/Wachstube, respectively. In one case, using the fl and st ligatures would be wrong; in the other, using the ligatures helps indicate the intended meaning of the composite words. For words such as these, software isn’t smart enough to “discern” which possible meaning is intended. Writers, of course, could choose to insert explicit hyphen characters to indicate the intended meaning.

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

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

It turns out that the rules of the selnolig package are set so as not break up the fi-ligature in the shorter words Chefin and Chefinnen, in keeping with the principle that the fi-ligature is permitted for suffixes that start with an “i”. In contrast, selnolig will break up the fi-ligature in the longer words Chefinnenleben and Chefinnenräume; in these cases, the working assumption is that innen acts as a prefix to the third morpheme (Leben or Räume). If this is not what you want, i.e., if you really do mean to refer to lives or spaces of female bosses, be sure to use \uselig{f1} instructions to preserve the fi-ligatures. Better yet, use explicit hyphens: Chefinnen-Leben and Chefinnen-Räume. And, while you’re at it, do consider writing the other forms as Chef-Innenleben and Chef-Innenräume. Your readers will thank you.

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

---

10 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’d need to mark up the words explicitly as follows: \uselig{Saufladen} and \uselig{Wachstube}.
5.4 How to provide additional ligature suppression patterns

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

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

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

\nolig{ffleit}{ff|leit}

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

When designing your own \nolig and \keelinig rules, you would ideally do so in a way that ensures that the rules are neither too specific (and hence only apply to a very small set of words) nor too general (and hence end up applying to words for which the rule wasn’t meant to apply).

Of course, this may be easier said than done. Consider, say, what would happen if you came up with the rule

\nolig{flei}{f|lei}

11This word really does occur in the aforementioned novel! This novel may very well also be the only place ever where you’ll encounter this word. I performed a Google search for the term “inbegriffleitend”; the only hits, apart from online editions of the novel itself, were the sites of a couple of French bloggers who agonized over how this word might possibly be translated from German to French...
This rule would certainly succeed in breaking up the fl-ligature in the words inbegriffleitend, Jugendtreffleiter, and Kunststoffleitung. It will also break up the fl-ligature in Laufleistung, Häuflein, Kreislaufleiden, Scherflein, and many more words. However, this rule would also incorrectly break up the fl-ligature in many other words, including fleissig/fleißig, fleischig, Hackfleisch, and Diplomfleißarbeit; I believe most German readers would prefer to see these words typeset with the fl-ligature, i.e., as fleissig/fleißig, fleischig, etc. When in doubt, try to err on the side of making your \nolig rules a bit too restrictive.

5.5 How to use the selnolig package to suppress certain ligatures globally

The main purpose of the selnolig package is, obviously, to disable certain ligatures selectively. However, it can also be used to suppress ligation globally for selected character pairs.22

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

\nolig{fi}{f|i}

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

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

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

Of course, your document may contain words not of German or English origin that contain some of these character pairs and do not involve a morpheme boundary crossing. For such words, it is not necessary to suppress the corresponding ligatures. For instance, in the word Kafka, one may not wish to suppress the 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, Tiraľkan, and Rifkin.23

---

22I 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.
23Aside: 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, I quickly discovered all kinds of further uses for it.
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 \keep11g 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 Aštafjew.

A “rare” typographic ligature that may warrant global suppression, at least for English language documents, is ij. To the best of my knowledge, a morpheme boundary crossing occurs for all English language words that contain the ij character pair: antijam, bije\'tion, demijohns, and bijack. By the logic set forth above, this ligature should therefore be suppressed for all of these words. 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 marijuanana (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 \keep11g directives so that this ligature isn’t suppressed for some names and words of Dutch origin, such as de Bruijn and riji\'tafel.

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

If a font provides many discretionary ligatures, the likelihood is high that words will occur for which the use of a ligature for the first two characters of a character triple might incorrectly pre-empt the use of a more appropriate ligature for the last two characters of that triple. Incidentally, the issue of ligature pre-emption is not limited to “discretionary” ligatures; it can also arise when dealing solely with “common” f-ligatures. Suppose, for instance, that a certain font provides ff, fi, and fl ligatures but no ffi and ffl ligatures. Consider how \TeX would typeset words containing ffi and ffl character triples. Left to its own devices, \TeX would let the leading ff-ligature pre-empt the trailing fi- and fl-ligatures, resulting in typographically incorrect outcomes for words such as wolffish (better: wolffish), safflower (safflower), auffinden (auffinden), and Schaffleisch (Schaffleisch).

In this section, we examine the use of \no11g rules to address the ligature pre-emption issue, focusing on cases of ſt, ſp, th, and ta character pairs being preceded by character pairs (for which the font provides ligatures) that end in s or t, respectively. This focus is dictated largely by the discretionary ligatures provided by the 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.

\footnote{For many fonts I’m familiar with, including the one used for this user guide, the fj character pair is available in the upright font shape as a digraph rather than as a true, i.e., joined-up, ligature.}

\footnote{If this ligature weren’t suppressed, the preceding words would be typeset as antijam, bije\'tion, demijohns, and bijack.}

\footnote{The word riji\'tafel, incidentally, features three consecutive “rare” ligatures. Another word that contains three rare ligatures, though not consecutive ones, is isthmus.}

\footnote{For the font Garamond Premier Pro, I’ve discovered the following, rather peculiar exception to the general rule that \TeX always gives precedence to a ligature for the first two characters of a character triple: For the character triple fis (as in fist and fish), Lua\TeX gives preference to the trailing is ligature over the leading fi ligature, causing these words to be typeset as fis\'h and fis\'t, respectively. I can’t tell if this is a conscious design feature or a bug in this font. The selnolig package overrides this behavior, i.e.,...}
Ligatures for \textit{as}, \textit{es}, \textit{is}, and \textit{us} that pre-empt an \textit{st} ligature

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

First, given the rather distinctive look of the \textit{st} ligature, the word \textit{stochastic} may look a bit odd if the \textit{st} ligature is used only once—\textit{stochastic}—simply because the \textit{as} ligature is allowed to pre-empt the second \textit{st} ligature; readers may prefer the look of \textit{stochastic}. Second, non-use of the \textit{st}/\textit{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 \textit{as}, \textit{is}, and \textit{us} character pairs and hence for which the issue of pre-emption of the \textit{st} doesn’t arise—and once in italics: \textit{must} and \textit{must}; readers may prefer the look of \textit{must} and \textit{must}. Or, consider the words “historian” and “history” when typesetting them in italics: \textit{historian} and \textit{history}; I’d say it’s much better to typeset them as \textit{historian} and \textit{history} rather than as \textit{historian} and \textit{history}. Similarly, I suspect that Australians and Austrians—at least the ones who care about discretionary typographic ligatures—may prefer to see the name of their country typeset as \textit{Austria} and \textit{Australia} rather than as \textit{Austria} and \textit{Australia}. Finally: Do you prefer the look of \textit{Do fast festive fists foster fustiness?} or that of \textit{Do fast festive fists foster fustiness?} You prefer the latter look too? Great!

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

The \texttt{selnolig} package is set to give preference to the distinctive-looking \textit{st} ligature over \textit{as}, \textit{is}, and \textit{us} ligatures. To this end, the following \texttt{\nolig} rules are provided:

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

Ligatures for \textit{as}, \textit{es}, \textit{is}, and \textit{us} that pre-empt an \textit{isp} ligature

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

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

\texttt{\nolig} it is set to give preference to the leading \textit{fi} ligature over the trailing \textit{is} ligature for words that contain the strings \textit{fist} and \textit{fish}; hence, they’ll be typeset as \textit{fish} and \textit{fist}, respectively.

Note that if the \texttt{broadf} option is set, as is the case for the document you’re currently reading, a side effect of this setting is that words such as \textit{deafish}, \textit{dwarfish}, \textit{elfish}, \textit{oafish}, \textit{selfish}, \textit{unselfish}, \textit{wolfish}, \textit{druffish}, \textit{gruffish}, \textit{offish}, \textit{raffish}, \textit{sniffish}, \textit{standoffish}, \textit{stiffish}, and \textit{toffish}, as well as the associated adverbs ending in \textit{-ly}, will not feature an \textit{is} ligature. This loss is, hopefully, not too serious.

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

\bibliographystyle{chicago}
\bibliography{references}
\end{document}
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 mathematicis 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 pronunciation 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 \texttt{\noalign{eth}{e|th}}—is not completely innocuous, though, because doing so will also suppress the at ligature for words such as boat hook, for which the th ligature would span a morpheme boundary and thus shouldn’t be employed anyway. For such words, then, there’s no need to suppress the at ligature. These cases are dealt with by providing specific \texttt{\keeplig} rules to re-enable the use of the at ligature.

Suppressing an et ligature in favor of a subsequent th ligature via \texttt{\noalign{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, \texttt{\keeplig} rules are provided to override the rule \texttt{\noalign{eth}{e|th}} for these words, so that they’ll get typeset as Beethoven, prophethood, and sweetheart.¹⁹

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

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

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

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

¹⁹Note that this method works if the font being used provides both et and th ligatures. If the text font you employ provides only a th ligature but no et ligature, these \texttt{\keeplig} rules should be disabled.
6 Further issues

6.1 Known bugs

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

6.2 Supplementary hyphenation exception patterns

\LaTeX{}’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 \texttt{-f-ing}, \texttt{-f-ier}, \texttt{-f-iest}, \texttt{-f-less}, \texttt{-f-like}, etc. Hyphenation exception lists are provided in the files \texttt{selnolig-english-hyphex.sty} and \texttt{selnolig-german-hyphex.sty}, respectively, for English and German words.

The German-language hyphenation exception list is currently still the shorter of the two. The German word list is shorter in part because it is assumed that writers of German-language documents use the \texttt{babel} package and select the option \texttt{ngerman} (or one of the synonymous language options); doing so also loads specialized hyphenation patterns suitable for German texts.\footnote{As was already noted earlier, the \texttt{selnolig} package is also compatible with the \texttt{hyphsubst} and \texttt{polyglossia} packages.}

It is possible to instruct \texttt{selnolig} \texttt{not} to load the package’s hyphenation exception lists. You may want to do so, for instance, if you must use UK-English hyphenation patterns and therefore shouldn’t use the US English-based hyphenation patterns provided by the package. (To the best of my knowledge, most of the hyphenation patterns employed in \texttt{selnolig-english-hyphex.sty} are common to UK and US English.) To skip loading the additional hyphenation patterns when invoking the \texttt{selnolig} package, you should specify the option \texttt{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 \texttt{babel} package with, say, the \texttt{ngerman} option, be sure to load \texttt{selnolig} package \texttt{after} the \texttt{babel} package. That way, the \texttt{selnolig} package’s additional hyphenation exception patterns won’t be overridden by \texttt{babel}’s settings.

Incidentally, if the files \texttt{selnolig-english-hyphex.sty} and \texttt{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 \texttt{\usepackage} statements without having to load the entire \texttt{selnolig} package.

6.3 How to track what the \texttt{selnolig} package is doing

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

Because of the redundancy built into some of the package’s \texttt{\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 \texttt{\nolig}
commands apply simultaneously, \textit{viz.}, \verb+
olig{auf[aelforuyaeou]}{auf|f}+ and \verb+
olig{ffahr}{f|fahr}+. For this word, then, the following information is written to the \texttt{.log} file:

\begin{verbatim}
pattern match: auffahren - auffaeiloruyaeou
pattern match: auffahren - ffahr
Do ligature suppression for: auffahren
Inserting nolig whatsit before glyph: f
Last char: n
\end{verbatim}

Some words contain more than one potential ligature suppression point. For example, if the word “Au-
flaufform”—which happens to have both an fl- and an ff-ligature that should be suppressed—is encountered, the following lines are written to the \texttt{.log} file; note that in this case, two separate \verb+\nolig+ commands “catch” the fl and ff ligatures:

\begin{verbatim}
pattern match: Auflaufform - flauf
pattern match: Auflaufform - Auflaeiouyaeou
pattern match: Auflaufform - auffaeiloruyaeou
pattern match: Auflaufform - fform
Do ligature suppression for: Auflaufform
Inserting nolig whatsit before glyph: l
Inserting nolig whatsit before glyph: f
Last char: m
\end{verbatim}

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

\begin{verbatim}
pattern match nolig and keeplig: fjord - fj - fjord
\end{verbatim}

If more than one \verb+\nolig+ rule \textit{as well as} a \verb+\keeplig+ rule apply to a given word, as is the case for the word “Streiflicht”, the following information is written to the \texttt{.log} file:

\begin{verbatim}
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
\end{verbatim}

Observe that the first nolig rule’s pattern, \textit{flich}, is overridden by the keeplig rule’s pattern \textit{flicht}. The second nolig rule’s pattern, \textit{reifl}, is \textit{not} overridden, and it is the debugging-related information associated with the second \verb+\nolig+ rule that ends up being written to the \texttt{.log} file.

To terminate or suspend the writing of the debugging-related information to the \texttt{.log} file, execute the command \texttt{\debugoff}. To restart the logging of this information, issue the command \texttt{\debugon}.
6.4 Suspending and restarting the operation of \texttt{selnolig}'s macros

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

\begin{verbatim}
\selnoligoff
\end{verbatim}

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

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

\begin{verbatim}
\selnoligon
\end{verbatim}

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

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

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

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

6.6 Making suggestions and reporting bugs

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

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

If anyone is thinking of creating rules to suppress ligatures selectively for languages other than English and German and would like to make use of the “machinery” provided by the \texttt{selnolig} package, I'd be delighted to provide reasonable amounts of programming-related assistance.\footnote{A promising candidate (in my view at least) for getting the \texttt{selnolig} treatment would be \texttt{blatletter} or \texttt{Fraktur} fonts and their special ligatures. When used to write German documents, it is well known that these ligatures need to be suppressed for certain}
The latest versions of all files that comprise the \texttt{selnolig} package may be found at the package's GitHub site. What's there may be slightly more up to date than what I manage to push to the CTAN page.

7 License and acknowledgments

The entire \texttt{selnolig} package is placed under the terms of the \LaTeX{} Project Public License, version 1.3 or later (\url{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 \texttt{tex.stackexchange.com}. 15 Without their help and support, this package would not exist. They certainly deserve most of the credit for the lua code used by the \texttt{selnolig} package.

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

Equally importantly, Felix and Steffen created scripts to test systematically and comprehensively the package's German \texttt{\nofig} and \texttt{\keepfig} rules for linguistic adequacy and (relative) completeness. They began with a corpus of almost 850 million \texttt{!} German words, which they marked up with information on the morphological constituents of each word. From this huge word list, they extracted a set of 462,000 unique word forms containing potential f-ligatures. According to their analysis, an early version (October 2012) of the \texttt{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! 33,34

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

\footnotesize{\textsuperscript{15}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 \LaTeX-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.}

\footnotesize{\textsuperscript{33}In the context of the \texttt{selnolig} package, a Type I error is the failure to suppress a typographically inappropriate ligature, and a Type II error is the improper suppression of a typographically appropriate ligature.}

\footnotesize{\textsuperscript{34}1,000 words contained more than one potential F-ligature, hence the difference.}
subjected to their testing algorithms, streamlining 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 \no11g and \keep11g rules as their final project for the course *Introduction to Computational Linguistics* at the University of Massachusetts at Amherst which they attended in the fall of 2012. They wish to thank the Institut für Maschinelle Sprachverarbeitung at the Universität Stuttgart for granting them a license for the morphological analysis tool SMOR and, in particular, Helmut Schmid for his guidance. They also express their gratitude to the Web-as-Corpus kool initiative (WaCky) for letting them use the SDeWaC corpus as well as to Rajesh Bhatt (University of Massachusetts at Amherst), Miriam Butt (Universität Konstanz), and Sabine Schulte im Walde (Universität Stuttgart) for helping them find the right resources for their project.

The *rmligs* perl script by Björn Jacke lists about 1,700 German language words for which various f-ligatures should be suppressed. The initial set of German-language \no11g rules I wrote were designed to capture the words listed by *rmligs*. Matthias Vogel very kindly shared with me a set of regular-expression based ligature suppressing macros, named *Ligatures-German*, he wrote for the WinEdt programmer’s editor. Matthias’s macros work by inserting babel-style “\ligature-suppressing directives in the appropriate places in the .tex file, which can then be compiled with pdftexX. These macros, and a file he sent me containing an extensive list of German words for which one or more f-ligatures should be suppressed, led me to thoroughly refine and extend the scope of the selnolig package’s German language ligature suppressing rules.

Barbara Beeton provided very detailed comments on an early version of the package’s user guide and its English language ligature suppression rules. She also noted that the readability of my surname might be enhanced if it were typeset as *Loretan* instead of as *Loretan*. David Bellows contacted me about the package and provided a suggestion that led me to extend some of the \no11g rules in Part 2 (activated by setting the option \broadf) of the file selnolig-english-patterns.sty.

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

---

55 Both their code and their finals paper are available online.
58 All versions of the *rmligs* package are archived at [http://www.j3e.de/ispell/igerman98/dict/](http://www.j3e.de/ispell/igerman98/dict/).
Appendices

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

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

\ProvidesPackage{selnolig-english-patterns}%
[2015/10/26]

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

% (b) fi -> f-i
% no cases in 'basic' group
% (c) fl -> f-l
% \nlig{fless}{f|less}
% beefless leafless ...
% Also: cuffless stuffless
% \nlig{flike}{f|like}
% dwarflike elflike ...
% Also: rufflike clifflike
% \nlig{flife}{f|life}
% halflife shelflife
% \nlig{flive}{f|live}
% halflives shelflives
% \nlig{eaflet}{eaf|let}
% leaflet(-s, -ed) leafleting
% leafletted leafleteer(s)
% \nlig{pdflatex}{pdf|latex}
% \nlig{Pdflatex}{Pdf|latex}
% better, though, to write 'pdf\LaTeX'
% \nlig{otfload}{otf|load}
% for the 'luaotfload' package...
% (d) ffi -> ff-i
% \nlig{faffian}{faff|ian}
% Pfaffian
% \nlig{lffian}{lff|ian}
% Wolffian Wulffian
% (e) ffl -> ff-l
% \nlig{fflaw}{ff|law}
% scofflaw scofflaws
% \nlig{fflink}{ff|link}
% cufflink cufflinks
% \nlig{ffload}{ff|load}
% offload offloads offloaded
% (f) ffi -> f-fi
% \nlig{haffinch}{haf|finch}
% chaffinch(es)

% halflives shelflives
% shelfful bookshelffuls -- TeXBook, p. 19
% shelf(-s, -ed) shelfleting
% shelflet(\ldots)
% shelfletted shelfleteer(s)
% pdflatex(pdf\LaTeX)
% Pdflatex(Pdf\LaTeX)
% better, though, to write 'pdf\LaTeX'
% otfload(\ldots)
% for the 'luaotfload' package...
% fff->ff-i
% Pfaffian
% lffian(\ldots)
% Wolffian Wulffian
% ffl->ff-l
% scofflaw scofflaws
% fflink(\ldots)
% cufflink cufflinks
% ffload(\ldots)
% offload offloads offloaded
% ffi->f-fi
% chaffinch(\ldots)
\nolig{ffish}{lf|fish}
% wolffish
\nlig{ffl}{f-fl}
% (g) ffl -> f-fl
\nolig{afflower}{af|flower}
% safflower
\nlig{ft}{f-t}
% (h) ft -> f-t
\if@noftligs % suppress ft ligatures globally
  \nlig{ft}{f|t}
\else % suppress ft ligatures selectively...
  \nlig{leftain}{lif|tain}
  \nlig{alftime}{aft|ime}
  \nlig{alftime}{aft|ime}
  \nlig{alf-tone}{aft|one}
  \nlig{ooftop}{oof|top}
  \nlig{ooftree}{oof|tree}
    \nlig{chief-tein halftime halftone}{chief|tein}
    \nlig{roof-top rooftop}{roof|top}
\else % suppress ft ligatures globally
  \nlig{ffth}{if|th}
    \nlig{elfth}{elf|th}
      \nlig{elftr}{elf|tr}
        % wolftrap calftrap
  \nlig{eaftr}{eaf|tr}
    % leaftrap
  \nlig{fftr}{ff|tr}
    % offtrack
\fi % end of \if@noftligs conditional block

% (i) fb, fh, fj, and fk ligatures
\nlig{fb}{f|b}
\nlig{fh}{f|h}
\nlig{fj}{f|j}
\nlig{fk}{f|k}
% But, make exceptions for fjord, fjell, etc
\keel{fjord} % Norwegian spelling
\keel{fjör} % Icelandic spelling, e.g., in
  \keel{Isafjördur and Ísafjörður}
\keel{fjarð} % Ísafjarðarbær (in Iceland)
\keel{fjall} % Swedish (?)
\keel{fjäll}
\keel{fjöll}
\keel{Prokofjew}
\keel{Sufjan} % Stevens
\keel{Eefje} % Dutch first name
\keel{Astafjew} % Author (Wiktor) and soccer player (Maksim)
% Further exceptions for names that contain 'fk'
\keel{Kafka}
\keel{Safka}
\keel{Potrafke}
\keel{Sprafke}
\keel{Shirafkan}
\keel{Tirafkan}
\keel{Rifkin}
% Part 2: Additional f-ligature suppression
% patterns if the 'broadf' option is set.
% ---------------------------------------------------
\if@broadfset
% (a) ff -> f-f
  \nlig{elfin}{elf|in}
  \keel{elfink} % distelfink
% no cases in 'broad' group
% (b) fi -> f-i
\nlig{elfin}{elf|in}
\keel{elfink} % distelfink
\nlig{elfin}{elf|in}
\keel{elfink} % distelfink
% For words ending in -f-ing, allow for
% "colloquial" abbreviations (-f-in').
\nlig{afing}{af|ing}
\nlig{afin'}{af|in'}
\nlig{chafing leafing loafing sheafing
\nolog{steeth}{s|teeth}
% houndsteeth
\nolog{astime}{as|time}
% pastime

% dis-t... words
\nolog{distast}{dis|tast}
\nolog{distast}{Dis|tast}
% distasteful
\nolog{distem}{dis|tem}
\nolog{Distem}{Dis|tem}
% distemperate
\nolog{disten}{dis|ten}
\nolog{Disten}{Dis|ten}
% distended
\nolog{distor}{dis|tor}
\nolog{Distor}{Dis|tor}
% distort distortion
\nolog{distrac}{dis|trac}
\nolog{Mistrac}{Mis|trac}
% Mistrace
\nolog{mistrac}{mis|trac}
\nolog{Mistrac}{Mis|trac}
% Mistrace
\nolog{mistranscribe}{mis|transcribe}
\nolog{Mistranscribe}{Mis|transcribe}
% Mistranscribe
\nolog{mistranslate}{mis|translate}
\nolog{Mistranslate}{Mis|translate}
% Mistranslate
\nolog{mistake}{mis|take}
\nolog{Mistake}{Mis|take}
% mistake mistaken mistaught unmistakable
\nolog{misteach}{mis|teach}
\nolog{Misteach}{Mis|teach}
% misteach
\nolog{mistend}{mis|tend}
\nolog{Mistend}{Mis|tend}
% mistend distend
\nolog{misterm}{mis|term}
\nolog{Misterm}{Mis|term}
% misterm misterms
\nolog{mistrue}{mis|true}
\nolog{Mistrue}{Mis|true}
% mistrue mistruth
\nolog{mistune}{mis|tune}
\nolog{Mistune}{Mis|tune}
% mistune Mistutor
\nolog{mistyp}{mis|typ}
\nolog{Mistyp}{Mis|typ}
% mistype

% disturb
\nolog{aasth}{aas|asth}
% Aasth
\nolog{aastricht}{aas|stricht}
% Maastricht

% mistime mistimed
\nolog{istitle}{is|tile}
% mistitle
\nolog{istook}{is|took}
% mistook

% anaesthesia synesthesia prosthesis
\nolog{steth}{s|thet}
% esthetic unesthetic
\nolog{sthes}{s|thes}
% prosthetist
\nolog{thic}{thi|thic}
% prosthodontist
\nolog{misth}{mis|th}
% misthink misthought misthrow

% (B) ct -> c-t
\nolog{istime}{is|time}
% ---------------
\texttt{\textbackslash no lig\{rctan\}(rc|tan)}
\% arctangent
\texttt{\textbackslash no lig\{rc\at\}(rc|\at)}
\% coarctation
\% (C) sp -> s-p
\% \texttt{\textbackslash no lig\{\textbackslash oth\}es\{p\}}
\texttt{\textbackslash no lig\{\textbackslash oth\}es\{p\}}
\% clothespin clothespress
\% business- congress- crafts-
\% dis- news- sales- spokes-
\% towns- trades- tribes- people
\texttt{\textbackslash no lig\{\textbackslash sp\}erson\{s\}person}
\% business- congress- crafts- drafts-
\% news- sales- spokes- person
\texttt{\textbackslash no lig\{\textbackslash sp\}resas\{e\}pas\{s\}}
\% trespass trespassing
\texttt{\textbackslash no lig\{\textbackslash is\}plat\{i\}s\{plat\}}
\% cisplatin (cis-platin, not cisp-latin!)
\texttt{\textbackslash no lig\{\textbackslash des\}pot\{d\}es\{pot\}}
\% despot despotic
\texttt{\textbackslash no lig\{\textbackslash sp\}resso\{s\}presso\{s\}}
\texttt{\textbackslash no lig\{\textbackslash des\}pon\{d\}es\{pon\}}
\texttt{\textbackslash no lig\{\textbackslash des\}pir\{d\}es\{pir\}}
\texttt{\textbackslash no lig\{\textbackslash de\}spoil\{d\}e\{spoil\}}
\texttt{\textbackslash no lig\{\textbackslash sides\}esp\{s\}ides\{sp\}}
\% sidespin, sidesplitting% blaspheme blasphemy
\texttt{\textbackslash no lig\{\textbackslash wides\}esp\{s\}ides\{p\}}
\% widespread
\texttt{\textbackslash no lig\{\textbackslash des\}prung\{d\}es\{p\}rung\{g\}}
\% gelandesprung
\texttt{\textbackslash no lig\{\textbackslash dis\}pa\[rst\]\{d\}is\{pa\}}
\% disparage disparaging dispart
\texttt{\textbackslash no lig\{\textbackslash dis\}pel\{d\}is\{pel\}}
\% dispassion dispatch
disproportion disprove
% transpolar
\nolig{ranspor}{rans|por}
% transport transportation
\nolig{ranspos}{rans|pos}
% transpose transposon
\nolig{risprud}{ris|prud}
% jurisprudence
\nolig{spiece}{s|piece}
% crosspiece frontispiece
\nolig{ewsp[ae]}{ews|p}
% newspaper newprint
\nolig{Hyannisp}{Hyannis|p}
% Hyannisport
\nolig{Keyesp}{Keyes|p}
% Keyesport
\nolig{Williamsp}{Williams|p}
% Williamsport
\nolig{assport}{ass|port}
% passport
\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{sththol}{st|thol}
% bolthole
\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
% bluetooth eyetooth snaggletoothed
\nlig(e|e)teeth\n% snaggleteeth eyetooth
deter determine deteriorate undeterred
\nlig(d|de)ter\n% deter
% niceties\n\nlig(c|ce)ties\n% nicety
\nlig(c|ce)ty\n% nicety
\nlig(f|fe)ties\n% safeties unsafeties biosafeties
\nlig(s|se)feties\n% safety
\nlig(s|se)fety\n% safety
\nlig(l|le)ties\n% subtleties
\nlig(l|le)ty\n% subtlety
teletype teletypewriter
\nlig(e|e)telev\n% pretelevision
\nlig(e|e)typ\n% archetype archetypal retype pretype
\nlig(a|asea)\n% asea
\nlig(a|asea)\n% asea
% aspec aseptic aseptically
\nlig(a|asophist)\n% ultrasophisticated
\nlig(a|asound)\n% ultrasound
\nlig(a|asund)\n% asunder
\nlig(a|Asund)\n% asunder
\nlig(a|Aspec)\n% aspect
\nlig(a|Aspec)\n% aspect infraspecific intraspecies
\nlig(i|infra)s\n% infrastructure infraspecific
\nlig(i|megast)\n% megastructure megastar
\nlig(i|megasp)\n% megaspores megascopic
\nlig(i|aspoon)\n% teaspoon
% (H) is -> i-s
% (a) not across morpheme boundaries
% (G) as -> a-s
% (The following may be a bug in fontspec)
\nlig(f|fish)\n% fish
\nlig(f|fist)\n% fist
\nlig(F|Fi|st)\n% Fist
\nlig(a|antis)\n% antis
\nlig(A|antis)\n% Antis
\nlig(i|antis)\n% antis
\nlig(a|antiscience)\n% antiscience
% (b) across morpheme boundaries
% Mustn't do global \nlig[anti|s] of words such as sycophantism,
% vigilantism, and mantissa.
% antisecrecy antisense antiseptic
\nolig{antis[aio]}{anti|sh}
% greenskeeper groundskeeper miskeep
\nolig{Antish[aio]}{Anti|sh}
% triskaidekaphobia
\nolig{antis[kl]}{anti|s}
% rathskeller
\nolig{Antis[kl]}{Anti|s}
% miskeep miskept miskick misknow
\nolig{antis[ou]}{anti|sm}
% Catskills Mountains, Catskill Park
\nolig{Antism[ou]}{Anti|sm}
% Peekskill % a town on the Hudson River
\nolig{antis[noptuy]}{anti|s}
% soulless tailless
\nolig{Antis[noptuy]}{Anti|s}
% \begin{verbatim}
% (I) us -> u-s
% (II)  ll -> l-l
% (K)  ll -> l-l
% (L)  fr -> f-r
% (M)  ij -> i-j
% (N)  sk -> s-k
% \end{verbatim}
% hemisphere planisphere hemispheric
\keeplig{isphr} % misphrase misphrased ...
\nolig{isph}{i|sph}
% 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.
% (available in EB Garamond font)
\nolig{ij}{i|j}
\keeplig{ij} % rijsttafel (Indonesian dish)
% 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, es, is, and us preceding sp
% .............................
\nolig{aspar}{a|spar}
\nolig{Aspar}{A|spar}
\nolig{asper}{a|sper}
\nolig{Asper}{A|sper}
\nolig{aspiration}{a|spir}
\nolig{Aspiration}{A|spir}
\nolig{aspirator}{a|spir}
\nolig{Aspirator}{A|spir}
\nolig{aspersion}{a|sper}
\nolig{Aspersion}{A|sper}
\nolig{asparagus}{a|spar}
\nolig{Asparagus}{A|spar}

% (iii) at and et preceding th
% ...............................
\nolig{ath}{a|th}
\nolig{eth}{e|th}
\nolig{espi[ct]}{e|spi}

%%% more rules to come...
\nolig{risp}{ri|sp}
\nolig{ SUSpect }{ Su|spect }
\nolig{Hispid}{Hi|spid}
\nolig{Hispani}{Hi|spani}
\nolig{Hispidulous}{Hi|spidulous}
\nolig{Hispid}{Hi|spid}
\nolig{Hispani}{Hi|spani}
\nolig{Hispidulous}{Hi|spidulous}

%%% more rules to come...
\nolig{gasp}{ga|sp}
\nolig{Gasp}{Ga|sp}
\nolig{hasp}{ha|sp}
\nolig{Hasp}{Ha|sp}
\nolig{lasp}{la|sp}
\nolig{rasp}{ra|sp}
\nolig{Rasp}{Ra|sp}
\nolig{wasp}{wa|sp}
\nolig{Wasp}{Wa|sp}
\nolig{cusp}{cu|sp}
\nolig{Cusp}{Cu|sp}
\nolig{suspect}{su|spect}
\nolig{suspects}{su|spect}
\nolig{uspici}{u|spici}
\nolig{uspicious}{u|spici}
\nolig{ausp}{au|sp}
\nolig{Ausp}{Au|sp}
\nolig{inauspicious}{inu|spici}
\nolig{auspicious}{au|spici}
\nolig{auspicious}{au|spici}

%%% more rules to come...
\nolig{ath}{a|th}
\nolig{ath}{a|th}
\nolig{ath}{a|th}
\nolig{ath}{a|th}
\nolig{ath}{a|th}
\nolig{ath}{a|th}
\nolig{ath}{a|th}
\nolig{ath}{a|th}
\nolig{ath}{a|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:

% The preceding rules are a bit too broad as they also suppress the 'at' ligature
% for words such as boathook and flathead \keeplig{ophethood}
% and the 'et' ligature in words such as
% Beethoven, prophethood, and sweetheart.
% Thus, also provide some \keeplig macros:
% (iv) at and et preceding ta
% ..............................
\keeplig{oathook} % boathook
\keeplig{eathook} % meathook \nolig{atap}{a|tap}
\keeplig{athouse} % bathouse boathouse cathouse \keeplig{catap} % catapult cataphoresis
\keeplig{rathole} % this will re-enable "th" liga \keeplig{Catap}
\keeplig{Rathole} % if "at" liga doesn't exist.. \keeplig{ratap} % rataplan
\keeplig{athead} % cathead fathead flathead meathead \keeplig{Ratap}
\keeplig{atherd} % goatherd neatherd\n\keeplig{eatheart} % greathearted \nolig{Loretan}{Lore|tan} % :-)
\keeplig{eetheart} % sweetheart
\fi % end of @ifhdlgset
\keeplig{Beethoven}
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} [2015/10/26]
% 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)
\keeplig{Stauffach} % Stauffacher
\keeplig{Stauffen} % Staufenbergattentat
\keeplig{stauffen}
\keeplig{Stauffer}
\keeplig{stauffer}
\keeplig{Stauffisch}
\keeplig{stauffisch}
\keeplig{chauffier}
\keeplig{Chauffier}
\keeplig{chauffeur}
\keeplig{Chauffeur}
\keeplig{chauffement} % Echauffement
\keeplig{Lauffen}
\keeplig{Stauffach}
\keeplig{Stauffen}
\keeplig{stauffen}
\keeplig{Stauffer}
\keeplig{stauffer}
\keeplig{Stauffisch}
\keeplig{stauffisch}
\keeplig{chauffier}
\keeplig{Chauffier}
\keeplig{chauffeur}
\keeplig{Chauffeur}
\keeplig{chauffement} % Echauffement
\keeplig{Brieff}{Brief|f}
\keeplig{brieff}{brief|f}
\keeplig{Chef}{Chef|f}
\keeplig{cheff}{chef|f}
\keeplig{Scheffel}
\keeplig{cheffekt} % Lacheffekt Wischeffekt
\keeplig{cheffekt}
\keeplig{Scheffel}
\keeplig{cheffdel}
\keeplig{cheffeln}
\keeplig{cheffizi} % hocheffizient
\keeplig{cheffizii}
\keeplig{Scheffé} % Scheffé (a statistician)
\keeplig{cheffizii}
\keeplig{Dampf}{Dampf|f}
\keeplig{dampff}{dampf|f}
\keeplig{Dorf}{Dorf|f}
\keeplig{dorff}{dorf|f}
\keeplig{Hanf}{Hanf|f}
\keeplig{hanff}{hanf|f}
\keeplig{Hoff}{Hoff|f}
\keeplig{hoff}{hoff|f}
\keeplig{Hoffacker}
\keeplig{ Hoffart}

% 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{aeiloryäöü}}{Auf|f}
\nolig{auf{aeiloryäöü}}{auf|f}
% Hundreds (thousands?) of words that
% start with or contain [aA]uff-,
% [kK]auf-, [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}
% Prüffeile
\nolig{fenster}{fenster}
% Hinterhoffenster Schlafl Tariffern
\nolig{ferien}{ferien}
% Reiterhoffenbauernhoffenferien
\nolig{fernsehen}{fernsehen}
% Abbruffernsehen
\nolig{fertig}{fertig}
% schlaffertig
\nolig{festl}{festl}
% Strafffestlegung
\nolig{fests}{fests}
% Strafffestsetzung
% Hoffestspielen Dorffestspeial
\nolig{fetisch}{fetisch}
% Schaffetischisten
\nolig{fetus}{fetus}
% Schaffetus
\nolig{fett}{fett}
% Huffett Rumpffett Scharffetter
\keeplig{Buffett}{Buffett} % Buffetheke
\keeplig{Büffett}{büffett}
\keeplig{buffett}{buffett}
\keeplig{büffett}{büffett}
% Obstbüffett
\nolig{festz}{festz}
% Brieffestzsetzet Stofffestzetzen
\keeplig{Buffetz}{Buffett} % Buffetspeizstellung
\nolig{feud}{feud}
% Kasernenhoffeudalismus
\nolig{feue}{feue}
% Dorffeuwehr Torfeuer Lauffeuwer
\nolig{filet}{filet}
% Meerwolffilet
\nolig{findung}{findung}
% Berufffindungsprozess
\nolig{firm}{firm}
% Breiffirmmen Tariffirmen
\keeplig{Affirm}{Affirm}
\keeplig{Affirm}{Affirm}
\nolig{folg}{folg}
% Impffolgen
\nolig{foll}{foll}
% Relieffollen
\nolig{folter}{folter}
% Tropffolter
\keeplig{Affoltern}{Affoltern} % town near Zurich
\nolig{fond}{fond}
% Tariffondlösung
\nolig{forder}{forder}
% Tarifforderung Strafforderung
\nolig{förder}{förder}
% ruffördernd kreislauffördernd schlaffördernd
\nolig{forell}{forell}
% Werfforellen
\nolig{form}{form}
% Kopfform Gugelform aufformen
\nolig{förm}{förm}
% reifförmig schweifförmig
\nolig{forsch}{forsch}
% Schlaufforschung Impfforschung
\nolig{foren}{foren}
% Abrufforens
\nolig{foru}{foru}
% Schlaufforum
\nolig{foto}{foto}
% Schlauffotogalerie
\nolig{föt}{föt}
% Wolffötus
\nolig{fracht}{fracht}
% Dampffrachter
\nolig{frag}{frag}
% Streiffragen
\keeplig{ Suffrage}{suffrage} % Suffragette
\keeplig{suffrage}{suffrage}
\nolig{frak}{frak}
% Rumpffraktion
\nolig{frank}{frank}
% Fünffrankenstück
\nolig{fräs}{fräs}
% Baumstumpfräse
\nolig{frau}{frau}
% Hoffrau Kauffrau
\nolig{fraum}{fraum} % Sprengstoffraub
\nolig{fraub}{fraub} % Treffraum
\nolig{frausch}{frausch} % Klebstoffrausch
\nolig{fraup}{fraup} % Stoffraupe
% rumpffern
\nolig{pffern}{pf|fern}
% Klopffestigkeit tropffester
\nolig{pffest}{pf|fest}
% Hirschkopffelsen
\nolig{pffels}{pf|fels}
% Dampffontäne
\nolig{pffont}{pf|font}
% Kampfführung
\nolig{pffüh}{pf|füh}
% Kampfführung
\nolig{pffeln}{pf|fels}
% Briefidiot Briefinhalt Pfandbriefinhaber
\nolig{pffont}{pf|font}
% Briefing % neu-Deutsch...
\keeplig{briefing}
\keeplig{ebriefing}
% debriefing, Debriefing
\nolig{pfest}{pf|fest}
% tropffester
\nolig{pfest}{pf|fest}
% reiffern
\nolig{reiffern}{reif|fern}
% Surffan
\nolig{rffan}{rf|fan}
% Surffane
\nolig{rffeel}{rf|feel}
% Surffeeling
\nolig{rffest}{rf|fest}
% Surffest
\nolig{rffinn}{rf|finn}
% Surffinne
\nolig{rffleck}{rf|fleck}
% Schorfflecken
\nolig{straffern}{straf|fern}
% Gurtschlossstraffern
\nolig{straffern}{straf|fern}
% Gurtstraffern
\keeplig{rtstraffern}
\keeplig{ssstraffern}
% Gurtschlossstraffern
\nolig{ünff}{ünf|f}
% fünffarbig fünffingrig fünfflügelig
\nolig{ünff}{ünf|f}
% Fünfflach fünfflammig fünffleckige
\nolig{wurff[aäeiloöruü]}{wurf|f}
% Auswurffach Einwurffehler
\nolig{wurff[aäeiloöruü]}{wurf|f}
% Hammerwurffinale
\nolig{aufisst}{auf|isst}
\nolig{Briefi}{Brief|i}
\nolig{Briefi}{Brief|i}
% Briefidiom Briefinhalt Pfandbriefinhaber
\keeplig{Briefing}
\keeplig{ebriefing}
% debriefing, Debriefing
\nolig{Chef}{Chef|i}
\nolig{chefi}{chef|i}
% Chefideologe Chefindianer
\\keeplig{chefin}
% Chefinformatiker
\keeplig{chefindianer}
% -inquisitor
\nolig{chefind}{chef|ind}
% Chefisolat Briefibel
\nolig{chefi}{chef|i}
% Recherchechefibel
\nolig{chefi}{chef|i}
% Recherchechofer
\nolig{chefi}{chef|i}
% Nietzschechefiber
\nolig{chefi}{chef|i}
% Wäschchefiere
\nolig{chefi}{chef|i}
% Wäschchefiere
\nolig{Dorf}{Dorf|i}
\nolig{Dorf}{Dorf|i}
% Dorfdyrale -information -institute
\keeplig{Hof}
% (viele Fälle!)
\keeplig{Hofier}
% Hofieren
\\keeplig{Kampf}
\keeplig{Kampf}
% Kampfesoologie Kampfinstrument
\\keeplig{Kaufer}
% Kaufer:
\\keeplig{kauf}
% Kaufidee kaufinteressiert Kaufimpuls
\\keeplig{lauf}
% Laufido Kreislaufinsuffizienz
\\keeplig{lauf}
% Blaufichte Blaufilte Blaufisch
\\keeplig{lauf}
% Blaufichte Blaufilte Blaufisch
\\keeplig{lauf}
% Planetenblaufilte Blaufisch
% -----------------
\nolig{Aufl}{[aeiouyäöü]}{Auf|l}
% Must avoid catching "Aufl.".
\nolig{aufl}{auf|l}
% Hundreds (thousands?!) of words
% However, must allow for quite a few
% exceptions:
\keeplig{auflair} % Tierschauflair
\keeplig{aufläche}% Anbau- Grau- Kau- ...
% Niveau- Plateau- Schau- Staufläche
\keeplig{aufliegl}% Tauflieglein
\keeplig{auflüssig} % Tauflüssigkeit
\keeplig{baufl} % Modellbauflieger Weinbauflecken
\keeplig{bauflügel} % Baufläche
\keeplig{bauflosen}{bauf|lös}
% grobauflosend
\keeplig{blaufl} % blaufleckig blauflauschig
\olig{blaufloch}{blauf|loch}
% Ablaufloch
\olig{blauflog}{blauf|log}
% Ablauflogik
\keeplig{Blaufl} % Blauflügel (Libelle)
\keeplig{Fünfl} % Fünflecktrig Fünflochdüsen
\keeplig{Fraufl} % Fruflüge
\keeplig{gauflöte} % Rheingauflöte
\keeplig{Frauflieg}% Schaufliegen
\keeplig{schauflöß} % Schauflüge
\keeplig{schauflug}
\keeplig{schauflüg}
\keeplig{Taufliege}
\olig{Briefl}{brief|l}
% lots and lots of words ...

keeplig{timpfleg} % Intimpflege
\nolig{impflück}{impf|lück}
\nolig{Kampfl}{Kampf|l}
\nolig{kampfl}{kampf|l}
% Kampflegende kampflüstern
% Wahlkampflüge
\nolig{Kopfl[äeioöuüy]}{Kopf|l}
\nolig{kopfl[äeioöuüy]}{kopf|l}
\nolig{Köpfl[äeioöuüy]}{Köpf|l}
\nolig{köpfl[äeioöuüy]}{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{kopfleur}{koppflaut}
\nolig{Pfeifl}{Pfeif|l}
\nolig{pfefl}{pfief|l}
\nolig{Pfiffl}{Pfiff|l}
\nolig{pfiff}{pfiff|l}
% Pfeiflaute Pfifflaut
\nolig{Prüfl}{Prüf|l}
\nolig{prüfl}{prüf|l}
\nolig{Reliefl}{Relief|l}
\nolig{reliefl}{relief|l}
% Relieflandschaft -lagen -landkarte
% relieflös
\nolig{Rufl}{Ruf|l}
\nolig{rufl}{ruf|l}
% viele Fälle, aber...
\keeplig{durufl} % Duruflé
\keeplig{mbarufl} % Gambarufluss
\keeplig{ruflagge} % Perufflagge
\keeplig{ruflisc} % Kängurufleisch
\nolig{Schafl}{Schafl|l}
\nolig{schafl}{schaf|l}
% Schaflader Schaflaus Schaflbeer
\nolig{Schiefl}{Schiefl|l}
\nolig{schiefl}{schiefl|l}
% schieflachen Schieflage schieflaufing
\nolig{Tieffl}{Tief|l}
\nolig{tiefl}{tiefl|l}
% tieflager stieflich
\nolig{Schlafl}{Schlaf|l}
\nolig{schlafl}{schlaf|l}
% lots and lots of words...


% Tropffilter Topffilter
\n
% Hammerwurffinale
\n
% Sprungwurffinente
\n
% Paraffinente
\n
% Hoffinanz Kauffinanzierung
\n
% No need to suppress ffi ligature in
% Bischoffingen and Bischoffinger!
\n
% Griffängen -laschen -leiste
% grifflos angrifflustig

% Schifflache Schiffladung Schifflinie

% lots of words...

% Greiffinger

% Greiffinger

% Gafflust

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

% Rohstofflastigkeit Treibstofflaster
% Rohstofflastigkeit Treibstofflaster
% Rohstoffindustrieller -importe
% Baustoffingenieur Kunststoffingenieur
% Kohlenstoffisotope

% Geheimdienstoffiziere

% permit ffi ligature for ff-ig suffix

% Schiffinnenraum Schiffinnenausbau

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

% Pfifflaute

% Pfifflaute

% Pfifflaute

% Sauerstoffloch

% Suffloch Griffloch Sauerstoffloch

% Gafflust
Schifflogbuch grifflos Griffloch

% aufflechten
\nolig(fflach){lf|flach}

% aufflachen
\nolig(mpfl){mpf|fl}

% aufflackern aufflammen Aufflickung
\nolig(opfl){opf|fl}

% Auffliegen
\nolig(upfl){upf|fl}

% Sumpfläche Sturzkampfflieger
\nolig(rfflad){rf|flad}

% Torffladen
\nolig(rfflasch){rf|flasch}

% Wegwerfflasche
\nolig(fflech){f|flech}

% Lauffläche Kampfflächen
% Zwölfflächer zwölffläglich
\nolig(fflech){f|flech}

% Sprengstoffladung
\nolig(öffle){öff|le}

% löfle
\nolig(offlo){off|lo}

% wirksstofflos Sauerstoffloch
% offload
\nolig(öfflack){öff|lack}

% Auspufflack
\nolig(taffle){taff|le}

% staffle
\nolig(uffläd){uff|läd}

% Suffläden
\nolig(ufflache){uff|lach}

% Bluffleck
\nolig(äfle){äf|le}

% Schäfle
\nolig(üffle){üff|le}

% schnüffle büffle trüffle
%%\nolig(ufflon){uff|lon}

% Mufflon

% 7. ffl -> f-fl
% --------------
\nolig(Auffl){Auf|fl}

% auffflackern auffflammen Aufflickung
% Auffliegen
\nolig(eiffleck){ief|fleck}

% Schleifflecklein
\nolig(iefflieg){ief|flieg}

% tieffliegend
\nolig(iefflog){ief|flog}

% tiefflug
\nolig(iefflur){ief|flur}

% Klosterhofflur
\nolig(iefflus){ief|flus}

% Prüffluss
\nolig(iefflös){ief|flös}

% Schleifflüsigkeit
\nolig(iefflut){ief|flut}

% Brieffluten Rückrufflut Anrufflut
\nolig(iefflur){ief|flur}

% tieffliegend
\nolig(iefflud){ief|flud}

% tiefflug
\nolig(iefflur){ief|flur}

% Zwölfflach
\nolig(mpffl){mpf|fl}

% Impflüsigkeit
\nolig(rfflad){rf|flad}

% Torffladen
\nolig(rfflasch){rf|flasch}

% Wegwerfflasche
% originally meant to capture "Sufflot"
% But: - Jacques-Germain Soufflot (1713-80)
% "Rue Soufflot" in Paris, sometimes
% mis-spelled as "Rue Sufflot"

% Freiwurflinie Maulwurflobbyist
% 8. ft -> f-t
% ------------
\if@noftligs
% "ft"-Ligatur global unterdrücken
\else
% "ft"-Ligatur selektiv unterdrücken
\fi
% Aber: ft-Ligatur wird doch verwendet für "Auft.")

% "ft"-Ligatur global unterdrücken
\nolig(Brief)(Brief|t)
\nolig(brief)(brief|t)
% Brieftasche Briertaube
\nolig(Chem)(Chef|t)
\nolig(cheft[a-z])(chef|t)
% Chefarmelixier Cheftrainer
\keeplig(omicheft[ceg])
\nolig(Dorft)(Dorf|t)
\nolig(dorft)(dorf|t)
% Dorftrottel - tratsch - tümpel
\nolig(Elfte)(Elf|te)
\nolig(elfte)(elf|te)
% elfte elftens
\keeplig(elfterfolg) % elfterfolgreichste
\nolig(Fünft)(Fünf|t)
\nolig(fünft)(fünf|t)
% Fünftageweche
% Schilfteich Schilflümpel
\nog{Senft[aeioaru]}{Senft[t]}
% Senftube
\keeplig{Senftenberg}
\nog{Straft[aeioeury]}{Straft[t]}
\nog{straft[aeioeury]}{straft[t]}
% (viele Fälle)
\keeplig{straftheit} % Unbestraftheit
\nog{Sufft}{Suff[t]}
% Sufftest Sufftext
\nog{Surft[aeioeury]}{Surft[t]}
% Surfthema Surfertipp
\nog{Tarift}{Tarif[t]}
\nog{tarift}{tarif[t]}
% Tarifthmen Tariftablelle
\nog{Tieft}{Tief[t]}
% Tieftänzer -träumen -tresor -tunnel
\nog{Torft}{Torf[t]}
\nog{torft}{torf[t]}
% Torftabellen Torfertuer Torftoilette
\nog{Wurft}{Wurf[t]}
\nog{wurft}{wurf[t]}
% Wurftalent Wurfertaler
\nog{ff[aeioeury]}{ff[t]}
% Stofftasche Sauerstofftank Stofftheorie
% Stofftier Stofftiger Stofftischtuch
% Auspufftopf Kunststofftonne
% Stofftradition Stofftrennung
% Kunststofftube Stoffturnschuhe
% Stofftäschchen Auspufftöpfe
% Kunststofftöpfe Kunststofftüten

%% Words that start with a capital letter and end in f-test
\nog{Abstreiftest}{Abstreif[est]}
\nog{Ankauftest}{Ankauf[est]}
\nog{Hörprüftest}{Hörprüf[est]}
\nog{Hüpfest}{Hüpf[est]}
\nog{Impfest}{Impf[est]}
\nog{Kauftest}{Kauf[est]}
\nog{Klopftest}{Klopf[est]}
\nog{Kneiftest}{Kneif[est]}
\nog{Lichtschweiftest}{Lichtschweif[est]}
\nog{Rückruftest}{Rückruf[est]}
\nog{Schnupfest}{Schnupf[est]}
\nog{Sumpf}{Sumpf[est]}
\nog{Tropf}{Tropf[est]}
\nog{Wettkampf}{Wettkampf[est]}
\nog{tofftest}{toff[est]}
% Impfstofftest Treibstofftests
\nog{aftee}{af[ee]}
% Schlaftee
\nog{auftee}{auf[ee]}
% Kreislauftee
\nog{laufetest}{lauf[est]}
% Kreislauftest
\nog{eiftie}{eif[tie]}
% Greiftiefe Steifertier
\nog{eiftit}{eif[tit]}
% Eingreifetel
\nog{eiftr}{eif[tr]}
% Eingreiftruppe Nadelstreifträger
% Greiftrupp -tier -training
\nog{elieft}{elief[t]}
% Reliefäufchen -tropfen -türme
\nog{enftee}{enf[ee]}
% Senfteig
\nog{ftabell}{f[tabell]}
% Ruftabelle
\nog{ftablett}{f[tablett]}
% Schafttabletten
\nog{ftafel}{f[tafel]}
% Pfeifertafel
\nog{ftag}{f[tag]}
% Tauftag Fünftagewoche
\nog{ftarptag}{ftarptag}
% Luftagentur
\nog{ftarptag}{ftarptag}
% füntägig elftägig zwölftägig
\nog{ftalsg}{ftalsg}
% schafstalsgrundig
\nog{ftanz}{f[tanz]}
% Kampftanz Schilftanz
\nog{ftanzahl}{f[tanzahl]}
% Heftanzahl
\nog{ftanzeig}{f[stanzeig]}
% Luftanzeige
\nog{ftanzüg}{f[tanzüg]}
% Haftanzüge
\nog{ftänz}{f[tänz]}
% Tieftänzer
% Schiefteller
\nlig\{ftari\}{f|tari}
% Anruftarif
\nlig\{ftaristokr\} % Zunftaristikratie
\nlig\{ftarn\}{f|tarn}
% Wegwerftarimaten
\nlig\{ftasse\}{f|tasse}
% Schürftasse
\nlig\{fasselt\} % Gruftasseln
\nlig\{ftatb\}{f|tatb}
% Straftatbestände
\nlig\{ftaten\}{f|taten}
% Kampftaten Straftaten
\nlig\{ftätig\}{f|tätig}
% Schürftätigkeit
\nlig\{tauch\}{f|tauch}
% Beruftaucher Kreislauftauchgerät
\nlig\{tauhl\}{f|tauhl}
% prüftauglich
\nlig\{taume\}{f|taume}
% Nachruftaumel
\nlig\{ftax\}{f|tax}
% Luftaxi

\nlig\{fteam\}{f|team}
% Jugendtreffteam Impfteam
\kepi\{fteamt\} % Streitkräfteamt
\nlig\{ftechn\}{f|techn}
% Stampftechnik schlaftechnisch
% Kraftstofftechnologie Pfeiftechnik
\nlig\{ftedd\}{f|tedd}
% Schlafteddy
\nlig\{fteich\}{f|teich}
% Schilfteich Dorfteich
\nlig\{ntfeich\} % Zunftfeiche
\nlig\{lteich\} % Schriftfeiche
\nlig\{fteigw\}{f|teigw}
% Dampfteigwaren
\nlig\{teil\}{f|teil}
% fünteilig Friedmannteil
% Raumschiffteil Riffteil Stoffteil
\nlig\{fteilfr\} % Luftteilfracht
\nlig\{telef\}{f|telef}
\nlig\{teleph\}{f|teleph} % old spelling...
% Wegwerftelefon Notruftelefonnummern
\nlig\{telegr\}{f|telegr} % Aufruftelegramm
\nlig\{teller\}{f|teller}
% 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{piefkei} % Ostpiefkei
\keeplig{Safka}
\keeplig{Sprafke}
\keeplig{Shirafkan}

% 10. fj -> f-j
% Suppress this ligature globally. Words
% of German origin seem to feature 'fj'
% only across morpheme boundaries.
\nolig{fj}{f|j}
% aufjauchzen aufjaulen fünfjährig Kampfjet
% Strafjustizgebäude Dorfjugend Kopfjäger ...

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

% 11. fff -> ff-f
% Just in case there's a font that
% features a triple-f ligature:
\nolig{fff}{ff|f}
% grifffest Futterstofffabrik Haafffischer
% sauerstofffrei Schifffahrt
% Stofffarbe Stofffäser Stofffülle
This macro will also break up any ‘fffl’ ligatures into ‘ff’ and ‘fl’ parts.

Examples: Auspufflamme Kunststoffflügel

Sauerstoffflasche Sauserstoffflamme

Schlifffläche Stofffleck
Treibstofffluss
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{0.302}
\def\selnoligpackagedate{2015/10/26}

% Announce who we are.
\typeout{=== Package \selnoligpackagename,}
\typeout{ Version \selnoligpackageversion,}
\typeout{ Date \selnoligpackagedate\space ===}
\ProvidesPackage{selnolig}[\selnoligpackagedate]

% Issue warning message if not running under LuaLaTeX.
\RequirePackage{ifluatex}
\ifluatex
\RequirePackage{luatexbase}
\else
\typeout{ WARNING WARNING WARNING }
\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 encountered, issue
% an error message and exit.

\AtBeginDocument{%
\ifluatex
  \@ifpackageloaded{fontspec}{{%  
\PackageError{selnolig}{%  
  \ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert
  \ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert
  The selnolig package *requires* the \ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert
  'fontspec' package, but it hasn't been \ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert
  loaded. Exiting now. \ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert
  \ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert\ErrorAlert
}}
\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}{\@englishttrue}
% synonymous options:
\DeclareOption{usenglish}{\@englishttrue}
\DeclareOption{ukenglish}{\@englishttrue}
\DeclareOption{USenglish}{\@englishttrue}
\DeclareOption{UKenglish}{\@englishttrue}
\DeclareOption{american}{\@englishttrue}
\DeclareOption{british}{\@englishttrue}
\DeclareOption{canadian}{\@englishttrue}
\DeclareOption{australian}{\@englishttrue}
\DeclareOption{newzealand}{\@englishttrue}

\DeclareOption{ngerman}{\@germantrue}
% synonymous options:
\DeclareOption{german}{\@germantrue}
\DeclareOption{austrian}{\@germantrue}

65
\DeclareOption{naustrian}{\@germantrue}
\DeclareOption{swiss}{\@germantrue}
\DeclareOption{swissgerman}{\@germantrue}

\DeclareOption{otherlang}{\@otherlangtrue}
\% synonymous option:
\DeclareOption{otherlanguage}{\@otherlangtrue}

\% For English, the default is to load only a fairly basic
\% set of non-ligation rules pertaining to f-ligatures.
\% Among them are the "standard five" (ff, fi, fl, ffi,
\% and ffl) ligatures as well as the ft ligature.
\%
\% Two options to augment the "basic" setting:
\% - broadf More non-ligation rules for f-ligatures
\% - hdlig Additional ligature suppression rules for
\%   'historic' and/or 'discretionary' ligatures,
\%   e.g., ct, sp, st, sk, th, as, is, us, fr,
\%   ll, et, at, and ta

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

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

\% The 'basic' option automatically sets the preceding
\% Booleans to 'false'.

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

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

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

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

66
% 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

% Part 2: Load the lua code and set up the user macros
% ----------------------------------------------------
\ifluatex
  \directlua{ require("selnolig.lua") }

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

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

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

% Recording operations of selnolig package to the log
% file is enabled via the '\debugon' command.
% Note: the default value of 'debug' (set in
% 'selnolig.lua') is 'false'. To turn off logging
% of selnolig's activity, use the command \debugoff.
\newcommand\debugon{%  
  \directlua{ debug=true }%
}%
% The first main user macro is called '\nolig':
\newcommand\nolig[2]{
  \directlua{
    suppress_liga("\luatexluaescapestring{#1}",
                  "\luatexluaescapestring{#2}" )
  }
}

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

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

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

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

\fi
% Part 3: What to do if the 'english' option is set
% ---------------------------------------------------
\if@english
  \ifluatex % English ligature suppression rules
    \RequirePackage{selnolig-english-patterns}
  \fi
  \if@addlhyph
    \RequirePackage{selnolig-english-hyphex}
  \fi
\fi

% Part 4: What to do if the 'ngerman' option is set
% ---------------------------------------------------
\if@german
  \ifluatex % German ligature suppression rules
    \RequirePackage{selnolig-german-patterns}
  \fi
  \if@addlhyph
    \RequirePackage{selnolig-german-hyphex}
  \fi
\fi

% Part 5: What to do if the 'otherlang' option is set
% ---------------------------------------------------
\if@otherlang
  % currently nothing included
\fi
D The package’s lua code: selnolig.lua

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

selnolig = { }

selnolig.module = {
    name = "selnolig",
    version = "0.256",
    date = "2015/10/26",
    description = "Selective suppression of typographic ligatures",
    author = "Mico Loretan",
    copyright = "Mico Loretan",
    license = "LPPL 1.3 or later"
}

debug=false -- default: don't output detailed information

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

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

function always_keep_liga(s)
keepliga[s] = true
end
function enable_suppression(val)
    suppression_on = val
    if val then
        debug_info("Turning ligature suppression back on")
    else
        debug_info("Turning ligature suppression off")
    end
end

function enableselnolig()
    luatexbase.add_to_callback( "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 \texttt{selnolig} package:
A suggested template

\% !TEX TS-program = lualatex
\% selnolig-bugreport.tex, 2015/10/26

\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 \texttt{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}
As I noted in the introduction, in English language documents the suppression of ligatures that cross morpheme boundaries is generally not considered to be an urgent typographical priority, possibly because words with ligatures that cross morpheme boundaries aren’t all that common. I performed a quick check of this claim by compiling Jack London's novels *Call of the Wild* and *The Sea Wolf*, obtained from Project Gutenberg's site in plain-text format, with selnolig. Sure enough, in *Call of the Wild* only one f-ligature is suppressed: the “fl” ligature in wolflike/wolflike. In *The Sea Wolf*, again only one f-ligature is suppressed: the “ft” ligature in fifth/fifth (3 instances). Not exactly a lot of words, right?!

The situation is quite different for German texts. E.g., in Thomas Mann’s novel *Die Buddenbrooks*, more than 430 words are caught by selnolig's rules; they are listed below. (Incidentally, the f-ligature in the words Kaufinger and Kaufingerstraße is suppressed because “Kaufinger” (“chew-finger”) looks unintentionally hilarious.)

<table>
<thead>
<tr>
<th>f-lig.</th>
<th>Words for which the f-lig. is suppressed by selnolig's rules (433 total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>fb, ffb</td>
<td>Aufbahrung, aufbegehrt, aufbegehrte, Aufbewahrungsort, Aufbietung, aublitzende, aufblitzten, aufblitzt, aufblitzte, aufblitzende, aufbrach, aufbrechen, aufbringen, aufbringt, Aufblick, Aufbräuchen, Untirch (4), Briefbeschwerer, Dampfbrot, daraufbringen, greifbaren, Greifbaren, heraufbefördert, hinaufblickte, Hofbräu, Hofbräuhaus (3), Hofbräu, Kopfbewegung (3), Kopfbewegungen, Krippenaufbaus, Laufbahn, Privatbriefbogen, Schafflick, Schaffbrüchen, Schlaflbedürfnis, steifbeinigen, Steifbruder (4), strafbar (2), tiefbelustigt, tiefblauen (2), unangreifbar</td>
</tr>
<tr>
<td>ff</td>
<td>Auffahren, Auffahrt, auffällend (5), auffassen, Auffassung, auffordern (2), auffördernde (4), Aufforderungen, Aufführung, auffällige (2), auffälliger (2), auffällt, aufführen, aufgeführte, fünffacher (2), heraufführt, heraufführte, Kauffahrteischiffen (Type II error/arch. spelling?), Liebhaberaufführung, Schnaffrisur, unauffällig, unauffällige</td>
</tr>
<tr>
<td>ffi</td>
<td>Auffinden</td>
</tr>
<tr>
<td>ffl</td>
<td>→ ffl: Aufflackern, aufflog; ffl → ffl: unübertrefftich (3), unübertrefflicher, vortrefflich (11), vortreffliche (2), vortrefflichen, vortreffliches, vortrefflichsten</td>
</tr>
<tr>
<td>fh, fhh</td>
<td>aufheben (3), Aufhebens, aufhebt, Aufhebung, aufheitert, aufhellte, aufhielt (3), Aufhorchend, aufhorchenden, aufhält (2), aufhirten (14), aufhörte (6), daraufhin (2), Fünhausen (2), fünfhundert (5), Hundertseitenwanzigtausendfünfhundert (!), Kaufherren (2), kämpfhaft (6), kampfhaft (2), darmhaft (4), Schaffheit, Steifheit (2), unauffälliges, unauffälliger, unauffälligsten</td>
</tr>
<tr>
<td>fl</td>
<td>aufleuchtete (2), aufleuchtet, aufleuchtenden, aufgelöst, Auflösung (11), begreiflich, Begreiflicherweise, behelflich (6), beruhigend (3), grünpflich (2), grünpflchen, Großkaufleuten, Handgreifliches, hilflos (3), hilflosen, Hilflosigkeit (2), Hilflosigkeitsoff, hinaualu, hüflich (7), hüfflich (2), hüfflichen, Hüflichkeitsform, hüflichst, kupflose, kupfloser, Kopfleute (9), Kopfleute-Witwenkasen, Kopfleuten (3), Kupfloch, käuflich (2), reiflich, schimpfpflich, schimpfpflchen, schlaflos, schlaflose, schlaflosen, Schlaflosigkeit, steifhenige, steiflichem, steiflicher, steifliches, tiefliegende, tiefliegenden (20), unbegreiflich (3), unbegreifliche, unbegreiflichen (3), unbegreiflicher, Unbegreiflicherweise, unerhörlich, ungeschöpft, ungeschöpft, Verzweiflung (23), verzweiflungsvoll (2), Zöpflein, zweifle (2)</td>
</tr>
<tr>
<td>ft</td>
<td>auffat (2), auftauchen, auftauchte, auf waren, auf waren, Auftritten (3), Auftritt (3), Auftritte (2), Auftritte (3), Auftrittes, auftrittten, Auftritten, Briefträger, elften, Elfter, Elfes (3), fünftausend (2), fünften (3), fünfter, Fünfter, Fünftes (9), Hoftheater, Hoftheaterbesuchen, Hofotre (2), Hoffür, schlafrunkenen, schlaftrunkener, Schnupftuch (3), Schnupftuche, Schnupftuches, Taugtes, Zwölfes</td>
</tr>
</tbody>
</table>
Here are the analogous compilations for Johann Wolfgang Goethe’s *Faust I* and *Faust II*:

<table>
<thead>
<tr>
<th>f-lig.</th>
<th>Words for which the f-lig. is suppressed by selnolig’s rules</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Faust I</strong> (30 words total)</td>
<td></td>
</tr>
<tr>
<td>fb</td>
<td>aufbewahrt, aufbindend, Schiffbruchs, Strumpfband, tiebewegte</td>
</tr>
<tr>
<td>fh</td>
<td>fünfhundert</td>
</tr>
<tr>
<td>fl</td>
<td>hilflos, höflich, Höflichkeit (3), Unhöfliches, Verzweiflung (2), teuflisch, teuflischen (2), unbegreiflich (3), würfle</td>
</tr>
<tr>
<td>ffl</td>
<td>Schifflein, trefflich (4), treffliche, trefflichen, trefflicher</td>
</tr>
<tr>
<td>ft</td>
<td>Auftrag</td>
</tr>
<tr>
<td><strong>Faust II</strong> (31 words total)</td>
<td></td>
</tr>
<tr>
<td>fb</td>
<td>Aufbau, aufbewahrt, aufblühender, Raufbold, Ungreifbarer</td>
</tr>
<tr>
<td>fh</td>
<td>unaufhaltsam (2)</td>
</tr>
<tr>
<td>fl</td>
<td>flehn [Type II error!], fünften, greiflich, höflich (2), Liebesbrieflein, Scherlein, schimpflich, sträflich, Tiefauflauerdes, Tröpflein, überteuflisch, unbegreifliche, unbehülflich, Verwerfliche, Verzweiflung, Zweifler, verwerflich, verzweiflend, zweiflen</td>
</tr>
<tr>
<td>ffl</td>
<td>trefflich</td>
</tr>
<tr>
<td>ft</td>
<td>Auftrag, Auftretend, Fünftausend</td>
</tr>
</tbody>
</table>

Without meaning to comment in any way on the literary merits of these works, I find it interesting that Goethe’s two pieces contain far fewer instances of words for which ligatures need to be broken up than does *Die Buddenbrooks*. I also find it mildly interesting that no fʒ and f{k} instances are present in the two Goethe pieces. Also at least somewhat interestingly, the noun “Verzweiflung” occurs 23 times in *Die Buddenbrooks* but only 3 times across both parts of *Faust*.

Note the Type II error, *viz.*, the word “flehn” (better: flehn), in the listing for *Faust II*. This error (which I’ve deliberately not removed) serves to illustrate—just in case this wasn’t already clear—that selnolig is not and cannot ever be entirely error-free. If you use the package in your work, I recommend that you compile your document with \debugon turned on from time to time. Doing so will write the results of selnolig’s work to the \log file. Then, examine the log file, either directly or via a machine search for lines containing the string “ligature suppression”. (This is, by the way, precisely how I started putting together the word lists shown above.) Any Type II errors should be fairly easy to spot this way. To fix them, you can edit your file and encase the words in question in \uselig instructions, or you can create new \keeplig instructions to override the action of the offending \nolig instructions. When creating new \keeplig rules, do take care not to introduce new Type I errors in the process. For instance, don’t create the rule \keeplig{flehn}, as doing so would cause failures to break up the fl ligatures in, *inter alia*, auflehnen, Autokopflehne, Stofflehne, and steiflehneig. (Actually, since these particular words don’t occur in *Faust II*, you’d be “safe” with \keeplig{flehn} as long as *Faust II* is the only document you need to typeset…)

It’s important to keep in mind that the lists shown above contain (i) selnolig’s “success stories” and (ii) any Type II errors. By design, they cannot show the package’s Type I errors, *viz.*, failures to break up ligatures that span morpheme boundaries. To catch any Type I errors, I’m afraid you’ll have read your output file and scan it for inappropriate ligatures. (Hopefully, there won’t be too many such instances!) To remedy any Type I errors, you should either insert \breaklig instructions in the words in question or devise new \nolig instructions—whatever works best for you.

A final plea: Please feel free to inform me about any Type I and/or Type II errors you believe are generated by the selnolig package. My email address is stated on the front page of this user guide. Happy \TeXing!