se2thesis—A Thesis Class for the Chair of Software Engineering II at the University of Passau, Germany

Stephan Lukasczyk†

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Abstract

One can choose from a wide variety of templates to write a thesis. Many universities provide very rigorous style guides and force their students to obey to those guides, even though they might be questionable from a typographics point of view. Other universities do not provide such guides and leave it to their students to choose or come up with a template. The latter is causing very differently-looking theses.

To avoid such a situation in the future this bundle combines several \LaTeX{} packages and classes for the use at the Chair of Software Engineering II at the University of Passau. We provide, among others, a document class for theses that shall be used by our students. The bundle is designed in a way that one can use the basic components as standalone packages to allow their reuse for other projects.

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†E-mail: stephan@dante.de
# The se2colors package

The `se2colors` package provides a set of commands and environments for managing colors in LaTeX documents. It includes features for setting color schemes, defining colors, and controlling color rendering. The package is designed to be compatible with various color spaces and to work seamlessly with LaTeX's standard color commands.

## The se2fonts package

The `se2fonts` package offers an extensive collection of fonts and font-related commands. It includes support for different font styles, sizes, and weights, as well as commands for managing font families and font specifications. This package is particularly useful for creating documents that require a high degree of typographic control.

## The se2packages package

The `se2packages` package is a comprehensive collection of packages that enhance LaTeX's functionality. It includes packages for quoting, number formatting, code listings, designing tables, controlling ligatures, orphans, and widows, using `microtype` for microtypographic optimisation, using `biblatex` for bibliographic references, and using `cleveref` for internal references. Load-time options are also supported.

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Part I
User Documentation

The first part of this file provides the documentation for the user of the se2thesis bundle. We provide the implementation in the second part of this document, starting at page 16, for those who are curious.

1 Introduction

The University of Passau does not provide a common thesis template to its students. For theses, written at the Chair of Software Engineering II, many students chose between two templates that were provided by different people from the chair; other students chose from the large variety of templates available from the internet, causing each thesis looking differently.

The author of this package provided a template, which he initially created for his bachelor and master thesis, that was recommended and used by many students. The implementation of that template, however, was very hacky and required some changes over time. This lead to the idea of creating a new template from scratch, that shall be used by all our students for their various types of theses, from bachelor to PhD level. The result is the se2thesis bundle.

The bundle itself consists of several LaTeX classes and packages that also allow reuse of various parts of it. Its main class is the se2thesis document class, an extension of the KOMA-Script scrreprt document class. The packages se2colors and se2fonts provide necessary colour and font settings for the se2thesis class; the se2packages allows to load several recommended packages (see Section 6) with our recommended, predefined settings. They are available as separate packages, however, to allow their reuse for other classes, packages, and projects, as well.

1.1 Installation

The se2thesis bundle is available from CTAN\footnote{ctan.org/pkg/se2thesis}. It is part of both MiKTeX and TeXLive. You can find its development version from GitHub\footnote{github.com/se2p/se2thesis}. The easiest way of installing it is through your TeX distribution; please check your distribution’s documentation on this. Note that it might be necessary to update your TeX distribution because they might not provide you updates; for example, there is a new version of TeXLive every year which needs to be installed separately. If you have installed an older version of se2thesis consider updating it to the latest version available from CTAN through your distribution.

For manual installation, we recommend to clone the Git repository and run the \texttt{l3build} tool that we also use for building the bundle. Running \texttt{l3build\ ctan} builds the source files and compiles the documentation. This creates a folder \texttt{build} containing these artefacts; \texttt{build/doc} contains the documentation, \texttt{build/local} the source files. See the documentation of \texttt{l3build} on how to install them manually. Please note that \texttt{l3build} also provides a \texttt{l3build\ install} target to install the bundle files to your local texmf tree.

The ”Island of TeX” project provides Docker images of TeXLive\footnote{islandoftex.gitlab.io/community/projects/docker/}. If you do not want to install/update TeXLive on your system you might want to consider their latest image, which contains a recent TeXLive 2023 build. They build their images weekly, thus also recent releases of se2thesis will be part of the image soon after their release date.
1.2 Availability on Overleaf

Since April 3, 2024, the se2thesis document template is also available from Overleaf. The document that is in Overleaf’s gallery is based on the example document that comes with this package. Any Overleaf user can just create a new thesis document based on the template by clicking the respective button on Overleaf’s gallery page.


Important remark: Currently, the Overleaf template does not support Lua\TeX{} but requires builds with pdf\TeX{}. The reason is that Overleaf does not yet ship \TeX{}Live 2024, but only \TeX{}Live 2023, which does not provide the respective font package (notably inconsolata-nerd-font). Until the latest \TeX{}Live will be available from Overleaf, one can only use the pdf\TeX{} mode, which has some drawbacks on the fonts, but works fine otherwise. From the Overleaf blog, we assume that \TeX{}Live 2024 might be available from some time in autumn 2024. We will update this documentation accordingly, as soon as the new version is available.

1.3 General Macros

They all have in common one macro, \texttt{\IfFormatAtLeastTF}; this macro is part of the latest \LaTeX{} kernel. However, not all users might have upgraded their \LaTeX{} installation to a level using a recently-enough kernel version. Therefore, every class and package of this bundle will conditionally define the following macro:

\begin{verbatim}
\IfFormatAtLeastTF \{\langle version\rangle\} \{\langle then block\rangle\} \{\langle else-block\rangle\}
\end{verbatim}

Checks whether the used \LaTeX{} format is at least the one from the given date value. The date needs to be specified either in YYYY/MM/DD or in YYYY-MM-DD format.

2 License

Permission is granted to copy, distribute, and/or modify this software under the terms of the \LaTeX{} Project Public License (LPPL), version 1.3c or later (https://www.latex-project.org/lppl.txt). The software has the status ‘maintained’.

3 The se2thesis class

The se2thesis class is the central component of this bundle. It provides a wide variety of settings, mostly regarding the title page (see Section 3.2) and the type area (see Section 3.3).

We aim to keep the se2thesis class relatively small, especially considering packages that we load. Currently, the class itself loads the se2colors (see Section 4) and se2fonts (see Section 5) packages. The following packages and classes are loaded: expl3, l3keys2e in case one uses a \LaTeX{} kernel from before 2022–06–01, graphicx, translations, KOMA-Script, xcolor, ifthen, as well as fonts, unicode-math, and libertinus-off if one uses Lua\TeX{}; for pdf\TeX{} we load fontenc, libertinus-type1, and AnonymousPro instead of the latter three. Furthermore, we load microtype; when using Lua\TeX{}, we also load lua-widow-control and selnolig.

However, we recommend to use a couple of further packages, together with some further options to those package. We describe these settings in Section 6. Please consider looking at this section when starting to write your document.
Before we start with a detailed documentation of the class, we explain one helper macro that can be used to check whether a package has been loaded.

\slcd_package_if_loaded:nTF {⟨package name⟩} {⟨true code⟩} {⟨false code⟩}

Checks whether a package has been loaded and conditionally executes code.

### 3.1 Load-time options

The se2thesis class defines several load-time options, all of them optional, on top of the options provided by the KOMA-Script document classes.

- **class**
  
  Set the base document class. Values are `scrreprt` or `scrbook`. Note: you cannot use `scartcl` because it does not provide the required chapter sectioning. Default is `scrbook`.

- **paper**
  
  Set the paper format. Possible values are `a4` or `b5`. Default is `a4`.

- **logofile**
  
  Defines the path to the University’s logo for the title page.

- **thesistype**
  

- **colormode**
  
  Select the color scheme used by the automatically loaded `se2colors` package, see Section 4 for a description.

### 3.2 The title page

Designing a title package for a thesis can be complicated. There might be some requirements that are not obvious to the user, especially considering the positioning of elements. The University of Passau, for example, requires the logo to be positioned on the top right of a page; theses—especially PhD theses that shall be published through the University’s library system—could be rejected from publication by the library until this is fixed.

We thus redeclare the standard \maketitle macro from KOMA-Script and customise it to our needs.

\maketitle

We override the definition of the \maketitle macro for our needs.

In addition to the macros provided by the KOMA-Script classes for the title-page values (e.g. \author, \title, we provide some further macros that can be used. Setting values to these
macros is optional in any case, if they are not set, the corresponding value is not put to the title page.

\version
\version {(version)}

Specify the version of the document. This can, for example, be a git hash of the current version.

\degreeprogramme
\degreeprogramme {{(programme-name)}}

Specify the degree programme the thesis is meant to be accepted in. Possible values are, among others, 'Informatik' if you are writing your thesis in German, or 'Computer Science' if you are writing the thesis in English.

\matrnumber
\matrnumber {{(matriculation-number)}}

Specify the matriculation number of the student writing the thesis. This is required for Bachelor and Master theses.

\supervisor\cosupervisor
\supervisor {{(name)}} \cosupervisor {{(name)}}

Specify the name of your supervisor and co-supervisor. Both people usually are professors.

\advisor\coadvisor
\advisor {{(name)}} \coadvisor {{(name)}}

Specify the name of your advisor and co-advisor. Both people usually are PhD students or postdocs.

\department\institute
\department {{(name)}} \institute {{(short-name)}} {{(name)}}

Specify the department and institute. The department is, for example, 'Faculty of Computer Science and Mathematics', the institute, for example, 'Chair of Software Engineering II'. If the \department value is not specify, we use 'Faculty of Computer Science' as the default value for English theses and 'Fakultät für Informatik und Mathematik' as the default value of German theses.

\external
\external {{(name)}}

Specify the name of an external referee.

\location
\location {{(name-of-town)}}

Specify the name of your residence town for the signature field.

To define the path to the logo graphics we require a different workflow: We do not bundle logo graphics with this package due to legal restrictions. They can be downloaded from the University’s website; please note that the website for downloading the logo graphics is only accessible from within the University’s campus network or a VPN connection. To specify the path to the logo graphics, we provide a load-time option to the se2thesis class called logofile (see Section 3.1).

When printing the thesis in two-side mode—which we recommend—the back of the title page again denotes author and title on the bottom.
Override this internal macro of KOMA-Script to print this information on the back side of the title page.

Additionally, we provide some internal rewritings to standard macros from KOMA-Script that allow to automatically split authors using the \and command.

We rewrite the definitions of \author and \@author to do this splitting automatically. Additionally, this also adds a correctly translated version of ‘and’ between the author names if required.

### 3.3 Type-area settings

The se2thesis class manipulates the type area compared to the default settings of the KOMA-Script classes. Our settings are inspired by the classicthesis package, which itself is inspired by the style used by famous statistician Edward Tufte. We provide predefined settings for DIN-A4, DIN-A5, and DIN-B5 papers. If you need settings for other paper sizes, please open an issue on this package’s GitHub repository (https://github.com/se2p/se2thesis) and we will happily include those settings in a future release of this bundle.

Additionally, we are setting the page footer in a way that it contains the page numbers in the outer margin and the headmarks split from the page numbers by a vertical bar.

### 3.4 Abstract for the thesis

Each thesis shall come with an abstract that summarises its content. The abstract should be written in the language the thesis is written in. Additionally, there is the requirement to provide a German abstract if the thesis is written in a foreign language.

We ensure that the \abstract command is defined for all document classes.

To typeset an abstract, we provide an environment called abstract. The environment takes an optional argument that specifies the language that is used in this abstract. Setting the abstract’s language will cause its title to change to the respective language; additionally, hyphenation is also changed for that language.

\begin{abstract}[language]
Your abstract text.
\end{abstract}

### 3.5 Acknowledgements

We provide the acknowledgements environment to typeset acknowledgements for your thesis. Using this environment is optional. Usually, bachelor and master thesis do not contain such an acknowledgements section, however, there is no general rule to this.

\begin{acknowledgements}[language]
Your acknowledgements.
\end{acknowledgements}
3.6 Document structuring

A larger work, such as a thesis, is usually structured in three large blocks: a frontmatter that provides all the overview, such as abstract, table of contents, etc., a mainmatter that contains all the actual content, and a backmatter for appendices. se2thesis ensures that the following macros are defined because they are not provided by all KOMA-Script classes.

\frontmatter \mainmatter \backmatter

Switches between frontmatter, mainmatter, and backmatter. Most notably, the frontmatter will have roman page numbers, while the other two will have arabic page numbers.

3.7 Authorship declaration

The University of Passau requires its students to provide an authorship declaration as part of their thesis for submission. They provide a template form, which would not fit the style of the se2thesis class. Thus, we provide the \authorshipDeclaration macro to typeset such a declaration. It uses the original (German) text of the declaration and fills in the values that are specified by the \author and \location macros.

\authorshipDeclaration

Print the authorship declaration text.

Please note: the authorship declaration will always be printed in German, no matter what the language of the thesis is. This happens due to legal requirements. In order to make this work, you have to load the babel or polyglossia package in a way that it also supports German hyphenation. For example, use

\usepackage[ngerman,main=UKenglish]{babel}

for a thesis with traditional English\(^4\) as its main language and support for German.

\signatureBox \signatureBox [(width)] {⟨signature-name⟩}

A helper macro to print the signature box for the authorship declaration. The optional argument [(width)] allows to specify a custom width for the signature line. The default is 5 cm. The mandatory argument {⟨signature-name⟩} specifies the name of the signee, which will be typeset below the signature line.

3.8 Research Questions and findings summaries

Most theses written at our Chair will require the student to provide some empirical evaluation of their work to shed insights whether their proposed ideas are actually useful. For an empirical study, one needs to specify research questions and maybe also hypotheses. The se2thesis class supports this by providing environments for this.

\resq (env) \hyp (env) \summary (env)

The \resq environment shall be used to specify a research question. The \hyp environment shall be used to specify a hypothesis. After describing the results, we recommend to give an explicit summary of the findings for

\(^4\)there is a nice, probably photoshopped, picture of a Steam setup dialogue stating that American English is a ‘simplified version’ of British English, see https://jakubmarian.com/is-american-english-simplified-and-british-english-traditional/.
a research question or hypothesis. This summary shall be given in one or two sentences. The summary environment provides a convenient way for this; it will be typeset in a highlighted box that is easy to spot and also allows readers of the work to quickly grasp the main findings.

\begin{summary}{label-reference}
The summary text itself.
\end{summary}

The environment expects as a parameter a label, for example, to a research question; however, this can also be arbitrary text.
4 The se2colors package

Several colours are specific to the university and we want to have a comprehensive interface to access them throughout all our packages. The se2colors package provides this exact feature. One can load it using `\usepackage{se2colors}` in the document preamble.

```
cmode = (choice)
```

Selects the colour mode that shall be used for creating the results, a choice from the options specified in Table 1. The default setting is 4C.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cmode=4C</td>
<td>Define colours in CMYK colour space (default).</td>
</tr>
<tr>
<td>cmode=CMYK</td>
<td>Alias for the previous.</td>
</tr>
<tr>
<td>CMYK, cmyk</td>
<td>Aliases for the previous.</td>
</tr>
<tr>
<td>cmode=RGB</td>
<td>Define colours in RGB colour space.</td>
</tr>
<tr>
<td>RGB, rgb</td>
<td>Aliases for the previous.</td>
</tr>
<tr>
<td>cmode=BW</td>
<td>Define colours in black-and-white colour space.</td>
</tr>
<tr>
<td>cmode=1C</td>
<td>Alias for the previous.</td>
</tr>
<tr>
<td>gray</td>
<td>Alias for the previous.</td>
</tr>
</tbody>
</table>

We define two basic colours that are taken from the University’s logo, namely UPSE2-Gray and UPSE2-Orange.

Additionally, we define four colours for the four faculties of the University:

- the Faculty of Law UPSE2-JUR.
- the School of Business, Economics and Information Systems UPSE2-WIWI.
- the Faculty of Arts and Humanities UPSE2-PHIL and
- the Faculty of Computer Science and Mathematics UPSE2-FIM.

Finally, we define a full set of supplementary colours:

- UPSE2-DarkGray with its derivatives
  UPSE2-DarkGray1, UPSE2-DarkGray2, UPSE2-DarkGray3, UPSE2-DarkGray4, and UPSE2-DarkGray5.

- UPSE2-White with its derivatives
  UPSE2-White1, UPSE2-White2, UPSE2-White3, UPSE2-White4, and UPSE2-White5.

- UPSE2-MediumGray with its derivatives
  UPSE2-MediumGray1, UPSE2-MediumGray2, UPSE2-MediumGray3, UPSE2-MediumGray4 and UPSE2-MediumGray5.

- UPSE2-LightGray with its derivatives
• UPSE2-Orange with its derivatives
  UPSE2-Orange1, UPSE2-Orange2, UPSE2-Orange3, UPSE2-Orange4, and UPSE2-Orange5.

• UPSE2-LightRed with its derivatives
  UPSE2-LightRed1, UPSE2-LightRed2, UPSE2-LightRed3, UPSE2-LightRed4, and
  UPSE2-LightRed5.

• UPSE2-DarkRed with its derivatives
  UPSE2-DarkRed1, UPSE2-DarkRed2, UPSE2-DarkRed3, UPSE2-DarkRed4, and
  UPSE2-DarkRed5.

• UPSE2-Green with its derivatives
  UPSE2-Green1, UPSE2-Green2, UPSE2-Green3, UPSE2-Green4, and UPSE2-Green5.

• UPSE2-Blue with its derivatives
  UPSE2-Blue1, UPSE2-Blue2, UPSE2-Blue3, UPSE2-Blue4, and UPSE2-Blue5.

• UPSE2-AccentGray with its derivatives
  UPSE2-AccentGray1, UPSE2-AccentGray2, UPSE2-AccentGray3, UPSE2-AccentGray4, and
  UPSE2-AccentGray5.
5 The se2fonts package

The se2fonts package sets the fonts of the document. In the first version of the bundle, we were running to use Hermann Zapf’s Palatino, Helvetica, and Neo Euler fonts. However, we figured out that they are not part of a standard \LaTeX installation, and thus required manual work by the user to install them. Furthermore, loading the fonts did not always work in a correct way.

Thus, we decided to rethink this decision and—as a consequence—now use different fonts that are part of a recent standard \LaTeX installation: we use the Libertinus fonts\footnote{https://github.com/alerque/libertinus} for serif, sans-serif, and math typesetting and the Inconsolata font\footnote{http://levien.com/type/myfonts/inconsolata.html} as a monospaced font.

Please note: this change might affect they way your documents look, and also might affect paragraph and line breaks!

If you are using Lua\TeX, fonts are expected to be present as open-type fonts; using pdf\TeX will fallback to Type-1 fonts.

Please note: the package does not support X\TeX!

The following options are defined by the se2fonts package to influence the selection of the fonts.

The following list provides examples for each of the fonts:

• An example text in Libertinus Serif

• An example text in Libertinus Sans

• An example text in Inconsolata

The package provides additional helper functions that are also available to the user.

\pdftexengine \pdftexengine
\xetexengine \xetexengine
\luatexengine \luatexengine

These commands alias the built-in \LaTeX3 macros \sys_if_engine_pdftex_p, \sys_if_engine_xetex_p, and \sys_if_engine_luatex_p. They can be used to check which engine the user is currently running.

\ifengineTF \ifengineTF \ifengineF \ifengineF
\ifengineT \ifengineT \ifengineT \ifengineT
\ifengineF \ifengineF \ifengineF \ifengineF

Allows to execute code based on the running engine. The base variant \ifengineTF expects the user to specify a condition, which can be built of combinations of the \pdftexengine, \xetexengine, and \luatexengine macros, followed by the code that will be executed if the condition holds and the code that will be executed if the condition does not hold.

For convenience, we provide the variants \ifengineT and \ifengineF that allow to omit an empty then or else branch, respectively.
6 The se2packages package

Several packages can be useful for writing a thesis. We provide a simple package for the user that loads these support packages with the recommended options. Please note that you might not need all these packages, however, having a look at them (especially their documentation) might give you an insight whether to use a certain package. Our general recommendation is to use as few packages as you can; some might have conflicts, others basically do the same, or are outdated. Please consider reading the documentation of each package you are using to figure out whether they have any conflicts with other packages (for example, one cannot use the recommended siunitx package together with SIunits) or they might require to be loaded at special places in your preamble (for example, hyperref is usually meant to be loaded as the last package, except you are also using cleveref, which needs to be loaded after hyperref).

6.1 The Recommended Packages

We first present the packages we recommend and give a rationale why we believe they should be used. Afterwards, we will discuss how to load the se2packages package to use one or the other of these recommended packages in the next section.

6.1.1 Quoting with csquotes

The csquotes packages allows you for intelligent quoting of text. While verbose quotes are not that common in computer science, the package still provides some useful macros to the user.

6.1.2 Number formatting with siunitx

While siunitx’s original purpose was to format physical quantities, it provides a lot of useful features when typesetting theses (and other documents) in computer science. When you skim through its documentation, especially look at the \qty and \num macros, as well as the section on typesetting tabular material. We also recommend reading an extensive discussion on number formatting, precision of presented numbers, and more related topics in Beyer et al.’s journal paper on requirements and solutions for reliable benchmarking [1].

6.1.3 Code Listings

We prefer using the minted package for code listings because it provides a lot of options for styling as well as built-in support for a huge number of languages. However, this package requires the installation of Python and the setting of the -shell-escape option to your \TeX engine. Please read the package’s documentation to set it up; the aforementioned Docker images from the Island of \TeX project provide you everything set up already.

In case you do not want to use the minted package, please consider using listings for typesetting your code listings.

Please be aware to use either minted or listings!

Attention: The way how minted is implemented causes the resulting code to be typeset in gray scale, if you use the se2colors package with option cmode=bw or the se2thesis class with colormode=bw (or their respective aliases). Students were requesting that they want to use the black-and-white mode of se2color because it saves lots of money when printing their thesis, while they want the colours in the syntax highlighting of minted. One can achieve this by adding hooks to the preamble of the document, after loading the minted package (which is recommend by setting minted=true as an option to se2packages):
Thanks to Ulrike Fischer for pointing out this hook mechanism.\footnote{tex.stackexchange.com/a/718719/14622}

Another option, if you do not want colours in the minted output when you use the grayscale mode of se2colors is the change the highlighting style, minted uses. The package for this provides the macro \usemintedstyle, which accepts a style available in your local pygments installation, see the pygments documentation\footnote{pygments.org/styles/} for an overview over the available styles; the bw style is explicitly designed for this kind of scenario.

6.1.4 Designing Tables

A basically mandatory package to all users of tables is the booktabs package. Especially its documentation is a must-read! It provides a large variety of hints for designing tables, most notably that one should never ever use vertical lines; horizontal lines should be used sparesly; booktabs provides three macros for lines that shall be used instead of \hline from standard \LaTeX: \toprule for a rule on the top of a table, above the column heads; \midrule to separate column heads and the content, and \bottomrule to mark the bottom of a table. We highly recommend that you follow this style when writing your thesis.

Note that captions of tables shall be put above the table whereas captions of figures shall go below the figure. The rationale is that a figure should be more or less self explaining while a table almost always needs some explanation.

Unfortunately, the distances when using a \caption above a table are wrong by default; when creating tables, consider loading the hvfloats package and use its \tabcaption instead of \caption for tables. The hvfloats package furthermore provides additional useful macros to typeset all kinds of floats.

6.1.5 Controlling Ligatures, Orphans, and Widows

When using Lua\TeX{} (which we recommend anyway), we additionally recommend to use the selnolig and lua-widow-control packages. The former implements a better control over ligatures, the latter provides better control over orphans and widows.

For some reason we were not yet able to fix properly, lua-widow-control works on some machine but fails on others, although they are using the same version of \TeX{}Live. We therefore deactivate lua-widow-control by default.

6.1.6 Use microtype for Microtypographic Optimisation

microtype is a game changer when writing documents. While standard \LaTeX{} provides reasonably good typography, the microtype package brings it to the next level. We refer you to the documentation of the package for details.

Additionally, we prefer to have a thin space around the m-dash. Although we are aware of the discussion whether to have such a space in English, we think it looks more beautiful and thus recommend it.
6.1.7 Use biblatex for Bibliographic References

The standard way of typesetting bibliographic references used to be Bib\TeX. The original Bib\TeX, however, seems to be very outdated in various ways: it originally only supported 7bit character sets and creating citation styles requires the usage of a kind of an archaic language. BibLa\TeX resolves many of the drawbacks of Bib\TeX; when combined with the biber engine, it supports full UTF-8 unicode, therefore correct sorting of the references now works out of the box; also creating citation styles can now be done using simple La\TeX commands.

6.1.8 Use cleveref for Internal References

La\TeX provides an easy-to-use reference mechanism using the \texttt{\label} and \texttt{\ref} macros. However, this requires some manual effort and the text needs to specify whether a reference is to a figure, section, or table. We often see in drafts artefacts such as ‘we discuss our findings in 4’; but what is ‘4’ here? Is it a section? A table? A figure?

To avoid such confusion, use the cleveref package, which automatically infers the type of the reference (see its documentation on how this works). The cleveref package furthermore avoids an additional, common mistake: between the name of the element and its reference one needs to have a non-breaking space that is often forgotten. Instead people are using normal spaces that can break at the end of a line which looks very ugly.

Please note that, in contrast to most other packages, cleveref has to be loaded after the hyperref package!

6.2 Loading se2packages

When you load the se2packages package it will automatically load the csquotes and booktabs packages because we believe that you definitely should use them. Still, it is possible to avoid this by setting the following load-time options to the package.

---

\begin{verbatim}
cquotes = \{true,false\}
nocquotes

The argument to cquotes can be one of true or false. The latter does not load csquotes, the former is the default value. By using nocquotes you can also avoid that csquote is loaded.

booktabs = \{true,false\}
nobooktabs

The argument to booktabs can be one of true or false. The latter does not load booktabs, the former is the default value. By using nobooktabs you can also avoid that booktabs is loaded.

siunitx = \{true,false\}

Decides whether the package loads siunitx and sets the options for siunitx to the values we recommend. The default value is false, set it to true to load siunitx.

We provide a load-time option to load minted and configure it.

minted = \{true,false\}

Decides whether the package loads minted and sets the options for minted to the values we recommend. The default value is false, set it to true to load minted. Note that minted requires additional installation effort and the use of the \texttt{-shell-escape} option, see its documentation.

---
We also provide a load-time option to load listings and configure it. This option and the minted option are mutually exclusive!

\begin{itemize}
\item \textbf{listings} \quad \texttt{listings = \{true,false\}} \\
Decides whether the package loads listings and sets the options for listings to the values we recommend. The default value is \texttt{false}, set it to \texttt{true} to load listings.
\end{itemize}

We provide a load-time option to load \texttt{selnolig}.

\begin{itemize}
\item \textbf{selnolig} \quad \texttt{selnolig = \{true,false\}} \\
\texttt{noselnolig} \\
The argument to \texttt{selnolig} can be one of \texttt{true} or \texttt{false}. The latter does not load \texttt{selnolig}, the former is the default value. By using \texttt{noselnolig} you can also avoid that \texttt{selnolig} is loaded.
\end{itemize}

We provide a load-time option to load \texttt{lua-widow-control}.

\begin{itemize}
\item \textbf{widowcontrol} \quad \texttt{widowcontrol = \{true,false\}} \\
\texttt{nowidowcontrol} \\
The argument to \texttt{widowcontrol} can be one of \texttt{true} or \texttt{false}. The former loads \texttt{lua-widow-control}, the latter is the default value. By using \texttt{nowidowcontrol} you can also avoid that \texttt{lua-widow-control} is loaded.
\end{itemize}

We provide a load-time option to load and configure \texttt{microtype}.

\begin{itemize}
\item \textbf{microtype} \quad \texttt{microtype = \{true,false\}} \\
\texttt{nomicrotype} \\
The argument to \texttt{microtype} can be one of \texttt{true} or \texttt{false}. The latter does not load \texttt{microtype}, the former is the default value. By using \texttt{nomicrotype} you can also avoid that \texttt{microtype} is loaded.
\end{itemize}

We provide a load-time option to load \texttt{biblatex}.

\begin{itemize}
\item \textbf{biblatex} \quad \texttt{biblatex = \{true,false,alphabetic,numeric\}} \\
Decides whether the package loads \texttt{biblatex} and sets the options for \texttt{biblatex} to the values we recommend. The default value is \texttt{false}, set it to \texttt{true} to load \texttt{biblatex}.
\end{itemize}

By setting the value to \texttt{alphabetic}, \texttt{se2packages} sets the citation style for \texttt{biblatex} to its alphabetic one; selecting \texttt{numeric} loads the numeric style as provided by the \texttt{acmart} bundle of the ACM. The value \texttt{true} also loads the latter style as a default.

Note that for the \texttt{numeric} style, we provide an enhanced \texttt{\autocite} command, which does not only print the citation mark in the text but also a short entry listing of the bibliography entry in the margin column of the page. This entry is only printed for the first occurrence of a citation per chapter to not clutter the margin column too much. The other citation commands from \texttt{biblatex} work as usual.

Additionally, we provide a load-time option to load \texttt{cleveref}. This option makes use of \LaTeX{}'s hook system to load it as the very last thing in the preamble. You shall not use this option, but load \texttt{cleveref} on your own, if your document requires packages that need to be loaded even \emph{after} \texttt{cleveref}.

\begin{itemize}
\item \textbf{cleveref} \quad \texttt{cleveref = \{true,false\}} \\
Decides whether the package load \texttt{cleveref}. The default value is \texttt{false}, set it to \texttt{true} to load \texttt{cleveref}.
\end{itemize}

Lastly, we provide one option to load all recommended packages (with \texttt{minted} preferred over \texttt{listings}).
Decides whether the package loads all recommended packages. The default value is false, set it to true to load them.

### 6.3 Additional Recommended Packages

The following packages are not part of se2packages because they serve a very specific purpose. They might not be needed by many thesis writers, however, we mention them here in order to give you a pointer. We list them in alphabetic order.

- **algorithm2e**: provides tooling for typesetting algorithm diagrams. We recommend loading it with the following options:

  ```latex
  \usepackage[ruled,noline,noend,linesnumbered]{algorithm2e}
  ```

- **hvfloat**: a package to control captions, fullpage, and double-page floats. We recommend to load it and use its `\tabcaption` for table captions.

- **lettrine**: allows to start a paragraph with a large initial. This is a beautiful opener for the first paragraph of a thesis’ main content.

- **mathtools**: an enhanced version of the famous `AMS math` package that provides more functionality and fixes some of the known bugs.

- **pdfx**: adds support for PDF/X and PDF/A, which is useful for creating documents that can be archived, for example, by the University’s library.

- **pgfplots**: a library for creating all kinds of plots, based on `pgf`, which is also the basis of the tikz package.

- **sidenotesplus**: a package to place all kinds of objects in the margin of a document, from footnotes (then called sidenotes) to figures and tables.

- **subcaption**: support for sub-captions and sub-figures.

- **tabularray**: a rewrite of `\LaTeX`’s array and tabular abilities in \LaTeX3. While the package offers a great combination of several other packages’ functionality, it tends to be quite slow for large tables due to the way it is implemented internally.

- **tcolorbox**: allows to typeset coloured boxes, for example, for short summaries on research questions or hypotheses.

- **tikz**: for creating all kinds of figures. Beware: Ti\textsc{\textit{k}}Z is a really huge package with a lot of functionality and a manual of more than 1300 pages.

### References

Part II
Implementation

The second part of this file provides the implementation of the package for a better understanding of what is happening.
1 Global helpers

These helpers might be useful for many exported packages and classes, thus we keep them on the global level of this implementation.

\begin{verbatim}
1 (\*init\*)
  Load only the essential support (\texttt{expl3}) 'up-front', and only if required.
2 \@ifundefined{ExplLoaderFileDate}
3 { \RequirePackage{expl3} }
4 {} \vspace{1em}
Make sure that the version of \texttt{l3kernel} in use is sufficiently new. We use \texttt{\ExplFileDate} as \texttt{\@ifpackagelater} does not work for pre-loaded expl3 in the absence of the package.
5 \@ifl@t@r\ExplLoaderFileDate{2020-01-09}
6 {} \vspace{1em}
7 {\PackageError{se2colors}{Support package expl3 too old}{You need to update your installation of the bundles 'l3kernel' and 'l3packages'\MessageBreak Loading=se2colors=will-abort!}}
8 \endinput
\end{verbatim}

\IfFormatAtLeastTF
This macro is not present in older kernels, thus we use the \LaTeX{} mechanism as this is correct for this case.

\begin{verbatim}
16 \providecommand \IfFormatAtLeastTF { \@ifl@t@r \fmtversion }
\end{verbatim}
(End of definition for \IfFormatAtLeastTF. This function is documented on page 2)

\begin{verbatim}
17 (/\*init\*)
\end{verbatim}

2 The se2thesis implementation

Start the DocStrip guards.

\begin{verbatim}
18 (\*class\*)
  Identify the internal prefix (\LaTeX{}3 DocStrip convention): only internal material in this submodule should be used directly.
19 \@@=slcd
20 \ProvidesExplClass {se2thesis} {2024-06-25} {4.2.0}
21 \slcd_package_if_loaded:nTF \slcd_package_if_loaded:nT \slcd_package_if_loaded:nF \slcd_package_if_loaded:p:n
\end{verbatim}

Defines various \LaTeX{} variants for the internal \texttt{\@ifpackageloaded} macro to check whether a package has been loaded.

\begin{verbatim}
22 \prg_new_conditional:Nnn \slcd_package_if_loaded:n { p, T, F, TF }
23 { \use:c { \@ifpackageloaded }
24 { \#1 }
25 { \prg_return_true: }
26 { \prg_return_false: }
27 }
\end{verbatim}
Load required packages early.
\RequirePackage{graphicx}
\RequirePackage{translations}
\LoadDictionary{se2translations}
\DeclareTranslationFallback{version-of-date}{
\Version\l__slcd_version_tl of \@date}
\DeclareTranslation{German}{version-of-date}{
\Version\l__slcd_version_tl vom \@date}
\DeclareTranslation{English}{version-of-date}{
\Version\l__slcd_version_tl of \@date}

2.1 Define Variables

The following variables are necessary for the argument handling.

\l__slcd_paper_int
A variable to store the key of the page size selected by the user.
\int_new:N \l__slcd_paper_int

We also need properties to store class options that are not for us, thus shall be handled by
the underlying base class.
\l__slcd_base_class_tl
\l__slcd_clsopts_prop
\l__slcd_unknown_clsopts_prop
\tl_new:N \l__slcd_base_class_tl
\prop_new:N \l__slcd_clsopts_prop
\prop_new:N \l__slcd_unknown_clsopts_prop

Define internal variables to hold the values of the fields of the title page.
\l__slcd_version_tl
\l__slcd_dgreeeprogramme_tl
\l__slcd_matrnumber_tl
\l__slcd_supervisor_tl
\l__slcd_coadvisor_tl
\l__slcd_department_tl
\l__slcd_institute_tl
\l__slcd_external_tl
\l__slcd_logofile_tl
\l__slcd_signature_tl
\l__slcd_location_tl
\tl_new:N \l__slcd_version_tl
\tl_new:N \l__slcd_dgreeeprogramme_tl
\tl_new:N \l__slcd_matrnumber_tl
\tl_new:N \l__slcd_supervisor_tl
\tl_new:N \l__slcd_coadvisor_tl
\tl_new:N \l__slcd_department_tl
\tl_new:N \l__slcd_institute_tl
\tl_new:N \l__slcd_external_tl
\tl_new:N \l__slcd_logofile_tl
\tl_new:N \l__slcd_signature_tl
\tl_new:N \l__slcd_location_tl

Define several dimensions for the typearea package to define the package style.
### 2.2 Load-time options

We define the key-value interface for the class.

```latex
\keys_define:nn { seiithesis }
{ 
  class .choice:, 
  class / report .meta:n = {class=scrreprt}, 
  class / scrreprt .code:n = \tl_gset:Nn \l__slcd_base_class_tl {scrreprt}, 
  class / book .meta:n = {class=scrbook}, 
  class / scrbook .code:n = \tl_gset:Nn \l__slcd_base_class_tl {scrbook}, 
  class .initial:n = scrbook, 
  paper .choices:nn = {a4,b5}{ 
    \int_gset_eq:NN \l__slcd_paper_int \l_keys_choice_int 
  }, 
  paper .initial:n = a4, 
  logofile .tl_gset:N = \l__slcd_logofile_tl, 
  logofile .initial:n =, 
  thesistype .choice:, 
  thesistype / bachelor .code:n = \tl_gset:Nn \l__slcd_thesis_type_tl {bachelor}, 
  thesistype / bachelorproposal .code:n = { 
    \tl_gset:Nn \l__slcd_thesis_type_tl {bachelorproposal} 
  }, 
  thesistype / master .code:n = \tl_gset:Nn \l__slcd_thesis_type_tl {master}, 
  thesistype / masterproposal .code:n = { 
    \tl_gset:Nn \l__slcd_thesis_type_tl {masterproposal} 
  }, 
  thesistype / phd .code:n = \tl_gset:Nn \l__slcd_thesis_type_tl {phd}, 
  thesistype / phdeng .code:n = \tl_gset:Nn \l__slcd_thesis_type_tl {phdeng}, 
  thesistype / phdphil .code:n = \tl_gset:Nn \l__slcd_thesis_type_tl {phdphil}, 
  thesistype / phdproposal .code:n = { 
    \tl_gset:Nn \l__slcd_thesis_type_tl {phdproposal} 
  }, 
}\endinput
```
2.3 Package loading

We load some packages with options that depend on options to the se2thesis class. Thus, we load them here to be able to hand them over the respective values.

We start with the se2colors and se2fonts packages.

\PassOptionsToPackage{\_\_\_slcd_colormode_tl}{se2colors}
\RequirePackage{se2colors}
2.4 User macros for the title page

In addition to the macros provided by the KOMA-Script classes for the title-page values (e.g. \author, \title), provide these additional macros to the user.

\version
Specify the version of the document, e.g., a git hash.
\ProvideDocumentCommand \version { m }
\tl_set:Nn \l__slcd_version_tl {#1}
(End of definition for \version. This function is documented on page 4)

\degreeprogramme
Specify the degree programme the thesis is meant to be accepted in.
\ProvideDocumentCommand \degreeprogramme { m }
\tl_set:Nn \l__slcd_degreeprogramme_tl {#1}
(End of definition for \degreeprogramme. This function is documented on page 4)

\matrnumber
Specify the matriculation number of the student.
\ProvideDocumentCommand \matrnumber { m }
\tl_set:Nn \l__slcd_matrnumber_tl {#1}
(End of definition for \matrnumber. This function is documented on page 4)

\supervisor \cosupervisor
Specify the supervisor and co-supervisor of the thesis, usually a professor.
\ProvideDocumentCommand \supervisor { m }
\tl_set:Nn \l__slcd_supervisor_tl {#1}
\ProvideDocumentCommand \cosupervisor { m }
\tl_set:Nn \l__slcd_cosupervisor_tl {#1}
(End of definition for \supervisor and \cosupervisor. These functions are documented on page 4)

\advisor \coadvisor
Specify the advisor and co-advisor of the thesis, usually a PhD student or postdoc.
\ProvideDocumentCommand \advisor { m }
\tl_set:Nn \l__slcd_advisor_tl {#1}
\ProvideDocumentCommand \coadvisor { m }
\tl_set:Nn \l__slcd_coadvisor_tl {#1}
(End of definition for \advisor and \coadvisor. These functions are documented on page 4)
Specify the university’s department and institute you are writing the thesis for.

\providecommand \department { m }
{ \tl_set:Nn \l__slcd_department_tl {#1} }
\providecommand \institute { o m }
{ \tl_set:Nn \l__slcd_institute_tl {#2} }

(End of definition for \department and \institute. These functions are documented on page 4.)

Specify an external referee.

\providecommand \external { m }
{ \tl_set:Nn \l__slcd_external_tl {#1} }

(End of definition for \external. This function is documented on page 4.)

Specify the location for the signature field.

\providecommand \location { m }
{ \tl_set:Nn \l__slcd_location_tl {#1} }

(End of definition for \location. This function is documented on page 4.)

2.5 Define logo, paper size, and paper style

For the logo on the titlepage, we define further variables to store its height and a box to store the logo itself.

\dim_if_exist:NF \l__slcd_logo_height_dim
\l__slcd_logo_box
{ \dim_new:N \l__slcd_logo_height_dim
\int_compare:nTF { \l__slcd_paper_int=1 }
{ \dim_gset:Nn \l__slcd_logo_height_dim { 67.5pt } }
{ \dim_gset:Nn \l__slcd_logo_height_dim { 56.8pt } }
}
\box_if_exist:NF \l__slcd_logo_box
{ \box_new:N \l__slcd_logo_box
{tl_if_empty:NF \l__slcd_logofile_tl
{ \hbox_gset:Nn \l__slcd_logo_box
{ \includegraphics[height=\l__slcd_logo_height_dim]
Set the paper size depending on the selected paper option.
\int_compare:nTF { \l__slcd_paper_int=1 }
{
\areaset[current]{350pt}{567pt}
\setlength{\marginparsep}{8.5cm}
\setlength{\marginparsep}{1em}
}
\areaset[current]{350pt}{567pt}
\setlength{\marginparsep}{7.4cm}
\setlength{\marginparsep}{0.87em}

Provide the package style. We start by loading the scrlayer-scrpage package with the appropriate options and set some basic properties.
\PassOptionsToPackage{automark}{scrlayer-scrpage}
\RequirePackage{scrlayer-scrpage}
clearpairofpagestyles
\setkomafont{pagefoot}{\normalfont\sffamily}

We can then define the footer for odd pages, which will appear on the right side of the page's footer. This definition contains first, as an optional argument, the style of a page with pagestyle set to empty, i.e., a page where a new chapter starts, and afterwards the style of a regular right-hand side page.
\rofoot{%
  \group_begin: \group_end:
  \footnotesize
  \hspace{\l__slcd_headmarkspace_dim}
  \group_begin:
  \color{UPSE2-Blue}
  \rule[\l__slcd_ruleraise_dim]{\l__slcd_rulewidth_dim}{\l__slcd_rulethickness_dim}
  \group_end:
  \hspace{\l__slcd_rulespace_dim}
  \begin{minipage}[b]{\l__slcd_pagemark_minipage_dim}
    \normalsize\textbf{\pagemark}
  \end{minipage}
  \hspace{\l__slcd_marginspace_dim}
}{%
  \group_begin: \group_end:
  \footnotesize
  \color{UPSE2-Blue}\headmark
  \hspace{\l__slcd_rulespace_dim}
  \begin{minipage}[b]{\l__slcd_pagemark_minipage_dim}
    \normalsize\textbf{\pagemark}
  \end{minipage}
}
Similarly, we define the footer for even pages, which will appear on the left side of the page's footer.

```
\lefoot[
{\null\hspace{\l__slcd_marginspace_dim}\footnotesize\begin{minipage}[b]{\l__slcd_pagemark_minipage_dim}\raggedleft\normalsize\textbf{\pagemark}\end{minipage}\footnotesize\hspace*{\l__slcd_rulespace_dim}\group_begin:\color{UPSE2-Blue}\rule[\l__slcd_ruleraise_dim]{\l__slcd_rulewidth_dim}{\l__slcd_rulethickness_dim}\group_end:\hspace*{\l__slcd_headmarkspace_dim}\group_begin:\color{UPSE2-Blue}\headmark\group_end}]
{\null\hspace{\l__slcd_marginspace_dim}\footnotesize\begin{minipage}[b]{\l__slcd_pagemark_minipage_dim}\raggedleft\normalsize\textbf{\pagemark}\end{minipage}\footnotesize\hspace*{\l__slcd_rulespace_dim}\group_begin:\color{UPSE2-Blue}\rule[\l__slcd_ruleraise_dim]{\l__slcd_rulewidth_dim}{\l__slcd_rulethickness_dim}\group_end:\hspace*{\l__slcd_headmarkspace_dim}\group_begin:\color{UPSE2-Blue}\headmark\group_end}
```

Finally, set the page style.

```
\pagestyle{scrheadings}
```

### 2.6 The title page

We start out by adjusting some \textsc{KOMA-Script} fonts.

```
\setkomafont{title}{\Huge}
\setkomafont{subtitle}{\Large}
\setkomafont{subject}{\normalsize}
\setkomafont{author}{\large}
\setkomafont{date}{\normalsize}
\setkomafont{publishers}{\normalsize}
```

Allow for automated splitting of author’s names.

```
\seq_new:N \l__slcd_author_seq
\renewcommand*{\author}[2][\l__slcd_author_seq]{\and (#2)}
\tl_if_empty:nTF {#1}
```

---

24
Define a new layer using the functionality from `scrlayer-scrpage` for the logo image.

\DeclareNewLayer[
  mode=picture,
  foreground,
  align=tr,
  hoffset=\oddsidemargin+1.5in+\textwidth,
  voffset=\coverpagetopmargin+1.5in+\ht\strutbox,
  width=\textwidth - \box_wd:N \l__slcd_logo_box,
  height=\box_ht:N \l__slcd_logo_box,
  contents={\putUL{\box_use:N \l__slcd_logo_box}},
]{title.seii.logo}

\DeclareNewPageStyleByLayers{title.seii}{title.seii.logo}
\renewcommand*{\titlepagestyle}{title.seii}

Redefine the \texttt{\maketitle} command. The following code is an adapted version of the corresponding KOMA-Script macro by Markus Kohm.

\renewcommand*{\maketitle}{[1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1][1]
\@maketitle
% \if@twoside
  \@tempswa
  \begin{minipage}[t]{\textwidth}
    \@uppertitleback
  \end{minipage}
  \vfill
  \begin{minipage}[b]{\textwidth}
    \@lowertitleback
  \end{minipage}
\@thanks\let\@thanks\@empty
\fi
\fi
\ifx\titlepage@restore\relax\else\clearpage\titlepage@restore\fi
\end{titlepage}
\l__slcd_title_box

Define a box for the title if it does not yet exist.
\box_if_exist:NF \l__slcd_title_box
  \box_new:N \l__slcd_title_box
\end{definition}
(End of definition for \l__slcd_title_box.)
\maketitle
Redeclare the \maketitle macro.
\renewcommand*{\maketitle}{%
  \group_begin:
  \setparsizes{\z@}{\z@}{\z@ plus 1fil}\par\updaterelative
  \thispagestyle{title.seii}
  \hbox_gset:Nn \l__slcd_title_box
    \parbox{\textwidth}{\__slcd_print_title:}
  \null
  \skip_vertical:n { 2.5 \box_ht:N \l__slcd_logo_box }
  \box_use:N \l__slcd_title_box
  \skip_vertical:n { .5 \box_ht:N \l__slcd_logo_box }
  \group_end:
  \@thanks\let\@thanks\@empty
\end{definition}
(End of definition for \maketitle. This function is documented on page 3)

Load the ifthen package.
\RequirePackage{ifthen}
Prints the title formatted appropriately. We start with printing the title, optional subtitle, and the author names.

```latex
\cs_new:Nn \__slcd_print_title: {  
\group_begin:  
\usekomafont{title}\centering@title\par  \group_end:  
\if\@subtitle\@empty\else\par\medskip\usekomafont{subtitle}\centering@subtitle\par\fi  \bigskip  \group_begin:  
\usekomafont{author}\centering@author\par  \group_end:  
\bigskip
}
```

The next block generates the text that describes the thesis. In case of a PhD thesis, this text is predefined to match the requirements. In case of a bachelor or master thesis, or a proposal thereof, we generate a text based on the values of the `thesistype` load-time option and the values of the `degreeprogramme`, `department`, and `institute` variables.

```latex
\exp_args:NV {  
\begin{center}  
\tl_if_eq:NnTF \l__slcd_thesis_type_tl { phd } {  
Dissertation zur Erlangung des Doktorgrades\  
der Naturwissenschaften (Dr.rer.nat.)\  
eingereicht an der Fakultät für Informatik und Mathematik\  
der Universität Passau\  
\rule{\textwidth}{.1pt}\  
\textbf{Dissertation submitted to}\  
the Faculty of Computer Science and Mathematics\  
of the University of Passau\  
in partial fulfillment of obtaining\  
the degree of a Doctor of Natural Sciences

\} {  
\tl_if_eq:NnTF \l__slcd_thesis_type_tl { phdeng } {  
Dissertation zur Erlangung des Doktorgrades\  
der Ingenieurwissenschaften (Dr.-Ing.)\  
eingereicht an der Fakultät für Informatik und Mathematik\  
der Universität Passau\  
\rule{\textwidth}{.1pt}\  
\textbf{Dissertation submitted to}\  
the Faculty of Computer Science and Mathematics\  
of the University of Passau\  
in partial fulfillment of obtaining\  
the degree of a Doctor of Engineering\  
} {  
\tl_if_eq:NnTF \l__slcd_thesis_type_tl { phdphil } {  
Dissertation zur Erlangung des Doktorgrades\  
der Naturphilosophie (Dr.phil.nat.)\  
eingereicht an der Fakultät für Informatik und Mathematik\  
} {  
\tl_if_eq:NnTF \l__slcd_thesis_type_tl { phdphil } {  
Dissertation zur Erlangung des Doktorgrades\  
der Naturphilosophie (Dr.phil.nat.)\  
eingereicht an der Fakultät für Informatik und Mathematik\  
} {}
```
Finally, generate a table with information about supervisors, advisors, etc.

\begin{center}
\begin{tabular}{@{} l @{\quad} l}
\tl_if_empty:NF \l__slcd_matrnumber_tl { \GetTranslation(Matrnumber) & \l__slcd_matrnumber_tl \\ }
\tl_if_empty:NF \l__slcd_supervisor_tl { \GetTranslation(Supervisor) & \l__slcd_supervisor_tl \\ }
\tl_if_empty:NF \l__slcd_cosupervisor_tl { \GetTranslation(Co-supervisor) & \l__slcd_cosupervisor_tl \\ }
\tl_if_empty:NF \l__slcd_advisor_tl { \GetTranslation(Advisor) & \l__slcd_advisor_tl \\ }
\tl_if_empty:NF \l__slcd_coadvisor_tl { \GetTranslation(Co-advisor) & \l__slcd_coadvisor_tl \\ }
\tl_if_empty:NF \l__slcd_external_tl { \\ }
\end{tabular}
\end{center}
Afterwards, override the definition of \@lowertitleback.

\renewcommand{\@lowertitleback}{% 
\group_begin: 
\noindent\textbf{\@author}:\emph{\@title}\tl_if_eq:NnT \l__slcd_thesis_type_tl { bachelor }{ \GetTranslation{Bachelor-thesis},~ }\tl_if_eq:NnT \l__slcd_thesis_type_tl { master }{ \GetTranslation{Master-thesis},~ }\tl_if_eq:NnT \l__slcd_thesis_type_tl { phd }{ \GetTranslation{PhD-thesis},~ }\GetTranslation{up},~\the\year. 
\group_end:}

(End of definition for \@lowertitleback. This function is documented on page 5.)

2.7 Styling of the sectioning commands

We change the formatting of the chapter, section, and sub-section headings.
\addtokomafont{chapterprefix}{\raggedleft\bfseries} \addtokomafont{chapter}{\mdseries} \addtokomafont{section}{\large\mdseries} \addtokomafont{subsection}{\normalsize\mdseries} \renewcommand{\chapterformat}{\enskip\mbox{\scalebox{3}{\color{UPSE2-DarkGray}\thechapter\autodot}}} \renewcommand{\chapterlinesformat}[3]{\parbox[b]{\textwidth}{\hrulefill#2}\par\bigskip\hrule} \RedeclareSectionCommand[afterskip=1.5\baselineskip]{chapter} \renewcommand{\chapterlineswithprefixformat}[3]{% 
\enskip\mbox{\color{UPSE2-DarkGray}\textbf{thechapter}\autodot}\par
\vspace{1.5\baselineskip}\hrulefill\par} \RedeclareSectionCommand[afterskip=1.5\baselineskip]{subsection} %
Change the loop of a paragraph to be italic and end with a full stop.
\setkomafont{paragraph}{\normalsize\normalfont\itshape}
\AddtoDoHook{heading/endgroup/paragraph}{\headingdot}
\newcommand*{\headingdot}[1]{.}

Change the width of a dictum
\renewcommand*{\dictumwidth}{0.42\linewidth}

2.8 Provide an environment for abstracts
We want to allow abstracts in German and English, which is also a requirement when writing a thesis in English. First, ensure that the \abstract macro is available for all classes.

\abstract
\providecommand{\abstract}{}

(End of definition for \abstract. This function is documented on page 5)

Then redefine the abstract environment such that it provides an optional argument for language selection.

abstract (env) Used to typeset an abstract for the thesis. The optional argument allows to specify a language. As a default the current document language will be used.
\RenewDocumentEnvironment{abstract}{o}{
\group_begin:
\IfNoValueF{#1}{\selectlanguage{#1}}
\scr@ifundefinedorrelax{chapter}{
\Iftocfeature{toc}{leveldown}{\subsection*}{\section*}
\GetTranslation{Abstract}
}{
\group_end:
}

2.9 Provide an environment for acknowledgements
Often, especially in a PhD thesis, one wants to acknowledge the help of certain people, for example, supervisors, family, and friends.
acknowledgements (env) Use to typeset the acknowledgements for the thesis.

\NewDocumentEnvironment { acknowledgements } { o } {
\group_begin:
  \IfNoValueF {#1} { \selectlanguage{#1} }
  \scr@ifundefinedorrelax{chapter}{
    \Iftocfeature{toc}{leveldown}
    \subsection*
  }{
    \section*
  }{ \GetTranslation{Acknowledgements} }
\group_end:
}

2.10 Document structuring macros

Ensure that these macros are defined. These are the exact definitions from KOMA-Script.

\newif\if@mainmatter\@mainmattertrue
\frontmatter
Starts the frontmatter. Most notably, set the page numbers to roman.
\providecommand*{\frontmatter} {
  \if@twoside\cleardoubleoddpage\else\clearpage\fi
  \@mainmatterfalse
  \pagenumbering { roman }
}

(End of definition for \frontmatter. This function is documented on page 6.)

\mainmatter
\backmatter
Starts the mainmatter or the backmatter. Most notably, set the page numbers to arabic.
\providecommand*{\mainmatter} {
  \if@twoside\cleardoubleoddpage\else\clearpage\fi
  \@mainmattertrue
  \pagenumbering { arabic }
}
\providecommand*{\backmatter} {
  \if@twoside\cleardoubleoddpage\else\clearpage\fi
  \@mainmatterfalse
}

(End of definition for \mainmatter and \backmatter. These functions are documented on page 6.)
### 2.11 Declaration of authorship

Provide a command to typeset the authorship declaration.

\begin{verbatim}
\NewDocumentCommand \authorshipDeclaration { o }
  { \par \group_begin:
    \selectlanguage{ngerman}
    \IfNoValueF {#1}
      { \tl_gset:Nn \l__slcd_location_tl {#1} }
    \tl_if_empty:NT \l__slcd_location_tl
      { \msg_new:nnn { seiithesis } { no-location-specified } { You need to specify a location for the authorship declaration. Either via the location macro or via the optional argument of the \authorshipDeclaration macro. } }
    \msg_warning:nn { seiithesis } { no-location-specified }
    \scr@ifundefinedorrelax{chapter}{
      \IfTocFeature{toc}{leveldown}
      {\subsection*}
      {\section*}
    }{
      \IfTocFeature{toc}{leveldown}
      {\section*}
      {\chapter*}
    } { Eigenständigkeitserklärung }
    Hiermit versichere ich, \l__slcd_signature_tl,
    \begin{enumerate}
    \item dass ich die vorliegende Arbeit selbstständig und ohne unzulässige Hilfe verfasst und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt, sowie die wörtlich und sinngemäß übernommenen Passagen aus anderen Werken kenntlich gemacht habe.
    \item Außerdem erkläre ich, dass ich der Universität ein einfaches Nutzungsrecht zum Zwecke der Überprüfung mittels einer Plagiatsoftware in anonymisierter Form einräume.
    \end{enumerate}
    \par \noindent \l__slcd_location_tl, \@date \signatureBox{\l__slcd_signature_tl}
  \group_end:
  \strut\cleardoublepage
  }
\end{verbatim}

(End of definition for \authorshipDeclaration. This function is documented on page 6.)

Provide a box for the signature.
\newcommand*{\signatureBox}[2][5cm]  
\parbox[t]{#1}{}  
\centering  
\rule{\linewidth}{.3pt}  
\makebox[0pt][c]{#2}  
\parbox{t}{

(End of definition for \signatureBox. This function is documented on page 6.)

2.12 Research questions and summary boxes

We utilise the ntheorem package for defining new theorem environments that are used for defining research questions and hypotheses. Therefore, start with loading this package, ntheorem.

\slcd_package_if_loaded:nT { amsmath }  
{  
\PassOptionsToPackage{amsmath}{ntheorem}  
}  
\RequirePackage{ntheorem}  
\theoremseparator{:}  

\begin{itemize}  
\item \textbf{resq (env.)} We can then define the resq and hyp environments using the \texttt{newtheorem} macro from ntheorem.  
\item \texttt{newtheorem}{resq}{Research~ Question}  
\item \texttt{newtheorem}{hyp}{Hypothesis}  
\end{itemize}

For the summary boxes, we utilise the tcolorbox package. We start with loading this package.

\begin{itemize}  
\item \textbf{summary (env.)} The summary environment expects a label and has the summary text in its content.  
\item \texttt{NewDocumentEnvironment} { \texttt{summary} } { \texttt{m +b} }  
\item \%  
\begin{tcolorbox}[\texttt{size=fbox,}]  
\texttt{rounded corners=all,}  
\texttt{attach title to upper,}  
\texttt{coltitle=black,}  
\texttt{fonttitle=\textbf{series},}  
\texttt{title=(Summary \#1),}  
\texttt{after title=:\ \ },}  
\end{tcolorbox}  
\item \#2  
\item \%  
\end{itemize}

\begin{itemize}  
\item \texttt{NewDocumentCommand} { \texttt{\summarybox} } { \texttt{m m} }  
\item \{  
\begin{itemize}  
\item \texttt{begin}{summary}{\#1} \#2 \texttt{end}{summary}  
\end{itemize}  
\end{itemize}

\texttt{\summarybox} The summarybox macro simplifies the usage of the summary environment.
3 Translations for se2thesis

3.1 English Translations

We provide the following English translations.

\ProvideDictionaryFor{English}{se2translations}[2024/06/25]
\ProvideDictTranslation{abstract}{abstract}
\ProvideDictTranslation{Abstract}{Abstract}
\ProvideDictTranslation{acknowledgement}{acknowledgement}
\ProvideDictTranslation{Acknowledgement}{Acknowledgement}
\ProvideDictTranslation{acknowledgements}{acknowledgements}
\ProvideDictTranslation{Acknowledgements}{Acknowledgements}
\ProvideDictTranslation{advisor}{advisor}
\ProvideDictTranslation{Advisor}{Advisor}
\ProvideDictTranslation{advisors}{advisors}
\ProvideDictTranslation{Advisors}{Advisors}
\ProvideDictTranslation{co-advisor}{co-advisor}
\ProvideDictTranslation{Co-advisor}{Co-advisor}
\ProvideDictTranslation{co-advisors}{co-advisors}
\ProvideDictTranslation{Co-advisors}{Co-advisors}
\ProvideDictTranslation{matrnumber}{matriculation number}
\ProvideDictTranslation{Matrnumber}{Matriculation number}
\ProvideDictTranslation{supervisor}{supervisor}
\ProvideDictTranslation{Supervisor}{Supervisor}
\ProvideDictTranslation{co-supervisor}{co-supervisor}
\ProvideDictTranslation{Co-supervisor}{Co-supervisor}
\ProvideDictTranslation{external}{external examiner}
\ProvideDictTranslation{External}{External Examiner}
\ProvideDictTranslation{degreeprogramme}{programme}
\ProvideDictTranslation{Degreeprogramme}{Programme}
\ProvideDictTranslation{Bachelor-thesis}{Bachelor Thesis}
\ProvideDictTranslation{Bachelor-thesis-proposal}{Bachelor Thesis Proposal}
\ProvideDictTranslation{Master-thesis}{Master Thesis}
\ProvideDictTranslation{Master-thesis-proposal}{Master Thesis Proposal}
\ProvideDictTranslation{PhD-thesis}{PhD Thesis}
\ProvideDictTranslation{PhD-thesis-proposal}{PhD Thesis Proposal}
\ProvideDictTranslation{date}{date}
\ProvideDictTranslation{Date}{Date}
\ProvideDictTranslation{university-of-passau}{University of Passau}
\ProvideDictTranslation{up}{University of Passau}
\ProvideDictTranslation{fim}{Faculty of Computer Science and Mathematics}

3.2 German Translations

We provide the following German translations.

\ProvideDictionaryFor{German}{se2translations}[2024/06/25]
\ProvideDictTranslation{abstract}{abstract}
\ProvideDictTranslation{Abstract}{Abstract}
\ProvideDictTranslation{acknowledgement}{acknowledgement}
\ProvideDictTranslation{Acknowledgement}{Acknowledgement}
\ProvideDictTranslation{acknowledgements}{acknowledgements}
\ProvideDictTranslation{Acknowledgements}{Acknowledgements}
\ProvideDictTranslation{advisor}{advisor}
\ProvideDictTranslation{Advisor}{Advisor}
\ProvideDictTranslation{advisors}{advisors}
\ProvideDictTranslation{Advisors}{Advisors}
\ProvideDictTranslation{co-advisor}{co-advisor}
\ProvideDictTranslation{Co-advisor}{Co-advisor}
\ProvideDictTranslation{co-advisors}{co-advisors}
\ProvideDictTranslation{Co-advisors}{Co-advisors}
\ProvideDictTranslation{matrnumber}{matriculation number}
\ProvideDictTranslation{Matrnumber}{Matriculation number}
\ProvideDictTranslation{supervisor}{supervisor}
\ProvideDictTranslation{Supervisor}{Supervisor}
\ProvideDictTranslation{co-supervisor}{co-supervisor}
\ProvideDictTranslation{Co-supervisor}{Co-supervisor}
\ProvideDictTranslation{external}{external examiner}
\ProvideDictTranslation{External}{External Examiner}
\ProvideDictTranslation{degreeprogramme}{programme}
\ProvideDictTranslation{Degreeprogramme}{Programme}
\ProvideDictTranslation{Bachelor-thesis}{Bachelor Thesis}
\ProvideDictTranslation{Bachelor-thesis-proposal}{Bachelor Thesis Proposal}
\ProvideDictTranslation{Master-thesis}{Master Thesis}
\ProvideDictTranslation{Master-thesis-proposal}{Master Thesis Proposal}
\ProvideDictTranslation{PhD-thesis}{PhD Thesis}
\ProvideDictTranslation{PhD-thesis-proposal}{PhD Thesis Proposal}
\ProvideDictTranslation{date}{date}
\ProvideDictTranslation{Date}{Date}
\ProvideDictTranslation{university-of-passau}{University of Passau}
\ProvideDictTranslation{up}{University of Passau}
\ProvideDictTranslation{fim}{Faculty of Computer Science and Mathematics}
4 se2colors implementation

Start the DocStrip guards.

Identify the internal prefix (\LaTeX3 DocStrip convention): only internal material in this submodule should be used directly.

Identify the package and give the overall version information.

\ProvidesExplPackage {se2colors} {2024-06-25} {4.2.0}

(A colour support package for the se2thesis bundle)

4.1 Load-time options

\l__slcd_colors_colormode_tl
Holds the colour mode selected by the user as a package load-time option.

\keys_define:nn { seiicolors }
{
    cmode .choice:,
    cmode / 4C .code:n = {
        \PassOptionsToPackage{cmyk}{xcolor}
        \tl_gset:Nn \l__slcd_colors_colormode_tl {4C}
    },
    cmode / RGB .code:n = {
        \PassOptionsToPackage{rgb}{xcolor}
        \tl_gset:Nn \l__slcd_colors_colormode_tl {RGB}
    },
    cmode / BW .code:n = {
        \PassOptionsToPackage{gray}{xcolor}
        \tl_gset:Nn \l__slcd_colors_colormode_tl {BW}
    },
    cmode / CMYK .meta:n = {cmode=4C},
    cmode / cmyk .meta:n = {cmode=4C},
    cmode / rgb .meta:n = {cmode=RGB},
    cmode / gray .meta:n = {cmode=BW},
    cmode / bw .meta:n = {cmode=BW},
    RGB .meta:n = {cmode=RGB},
    rgb .meta:n = {cmode=RGB},
    CMYK .meta:n = {cmode=4C},
    cmyk .meta:n = {cmode=4C},
    BW .meta:n = {cmode=BW},
    bw .meta:n = {cmode=BW},
    gray .meta:n = {cmode=BW},
}
\keys_set:nn { seiicolors } { cmode = 4C }
(End of definition for \l__slcd_colors_colormode_tl)

4.2 Option handling

\IfFormatAtLeastTF { 2022-06-01 }
{
    \ProcessKeyOptions [ seiicolors ]
}
\ProcessKeysOptions { seicolors }

4.3 Colour definitions

Load the \texttt{xcolor} package for colour definitions.

\RequirePackage{xcolor}

Define the primary colours gray and orange as given by the University of Passau’s style guides.

\definecolorset[named]{RGB/cmyk}{UPSE2-}{%
  Orange,242,148,0/0.00,0.44,0.95,0.01;%
  Gray,153,159,158/0.40,0.28,0.28,0.00;%
  JUR,229,49,56/0.90,0.81,0.01;%
  WII,0,96,57/0.87,0.20,0.87,0.36;%
  PHIL,188,42,51/0.06,0.90,0.81,0.11;%
  FIM,0,90,161/0.93,0.63,0.01,0.02;%
  DarkGray,77,77,77/0.74,0.67,0.62,0.18;%
  White,255,255,255/0.00,0.00,0.00,0.00;%
  MediumGray,127,127,127/0.52,0.43,0.40,0.02;%
  LightGray,229,229,229/0.08,0.06,0.04,0.00;%
  LightRed,229,49,56/0.90,0.81,0.01;%
  DarkRed,188,42,51/0.93,0.20,0.87,0.36;%
  Green,0,96,57/0.87,0.80,0.81,0.11;%
  Blue,0,90,161/0.93,0.63,0.01,0.02;%
  AccentGray,153,159,158/0.40,0.28,0.28,0.00;%
}\%

Define the derived colours.

\colorlet{UPSE2-DarkGray1}{UPSE2-DarkGray!20!white}
\colorlet{UPSE2-DarkGray2}{UPSE2-DarkGray!40!white}
\colorlet{UPSE2-DarkGray3}{UPSE2-DarkGray!60!white}
\colorlet{UPSE2-DarkGray4}{UPSE2-DarkGray!75!black}
\colorlet{UPSE2-DarkGray5}{UPSE2-DarkGray!50!black}
\colorlet{UPSE2-White1}{UPSE2-White!95!black}
\colorlet{UPSE2-White2}{UPSE2-White!85!black}
\colorlet{UPSE2-White3}{UPSE2-White!75!black}
\colorlet{UPSE2-White4}{UPSE2-White!65!black}
\colorlet{UPSE2-White5}{UPSE2-White!50!black}
\colorlet{UPSE2-MediumGray1}{UPSE2-MediumGray!20!white}
\colorlet{UPSE2-MediumGray2}{UPSE2-MediumGray!40!white}
\colorlet{UPSE2-MediumGray3}{UPSE2-MediumGray!60!white}
\colorlet{UPSE2-MediumGray4}{UPSE2-MediumGray!75!black}
\colorlet{UPSE2-MediumGray5}{UPSE2-MediumGray!50!black}
\colorlet{UPSE2-LightGray1}{UPSE2-LightGray!90!black}
\colorlet{UPSE2-LightGray2}{UPSE2-LightGray!75!black}
\colorlet{UPSE2-LightGray3}{UPSE2-LightGray!55!black}
\colorlet{UPSE2-LightGray4}{UPSE2-LightGray!50!black}
\colorlet{UPSE2-LightGray5}{UPSE2-LightGray!10!black}
\colorlet{UPSE2-Orange1}{UPSE2-Orange!20!white}
\colorlet{UPSE2-Orange2}{UPSE2-Orange!40!white}
\colorlet{UPSE2-Orange3}{UPSE2-Orange!60!white}
\colorlet{UPSE2-Orange4}{UPSE2-Orange!75!black}
\colorlet{UPSE2-Orange5}{UPSE2-Orange!50!black}
\colorlet{UPSE2-LightRed1}{UPSE2-LightRed!20!white}
5 se2fonts implementation

Start the DocStrip guards.

Identify the internal prefix (\TeX\3 DocStrip convention): only internal material in this submodule should be used directly.

Identify the package and give the overall version information.

\ProvidesExplPackage{se2fonts}{2024-06-25}{4.2.0}
{A font-selection support package for the \se2thesis bundle}

5.1 Load-time options

The package does not have any load-time options; the formerly defined option to set the font mode was removed with \se2thesis version 4.0.0.

5.2 Helper macros

Define a warning message of users of pdf\LaTeX that not all features of the fonts are available and that they should consider using Lua\TeX instead.

\msg_new:nnnn { seiifonts } { pdflatex-used }
\{ You are using pdfLaTeX with the se2fonts packages.\}
\{ While this works some font features are not available, consider using lualatex instead.\}
\pdftexengine\xetexengine\luatexengine
We define several alias macros to identify which engine the user is running.
\cs_new_eq:NN \pdftexengine \sys_if_engine_pdftex_p:
\cs_new_eq:NN \xetexengine \sys_if_engine_xetex_p:
\cs_new_eq:NN \luatexengine \sys_if_engine_luatex_p:
(End of definition for \pdftexengine, \xetexengine, and \luatexengine. These functions are documented on page 10.)
\ifengineTF\ifengineT\ifengineF
True, if the engine used matches the given first argument.
\NewExpandableDocumentCommand \ifengineTF { \iftest{#1}{#2}{#3} }
\NewExpandableDocumentCommand \ifengineT { \iftest{#1}{#2}{}
\NewExpandableDocumentCommand \ifengineF { \iftest{#1}{#2}{} }
The package is not tested with \texttt{Xe\LaTeX}, thus we provide an error to the user and stop the execution if they want to use the package with \texttt{Xe\LaTeX}.

\ifltxengine
\else
\msg_new:nnnn { seiifonts } { xetex-not-supported }
{ Xe\LaTeX{}~ is~ not~ supported~ by~ the~ \texttt{se2fonts}~ package. }
\msg_error:nn { seiifonts } { xetex-not-supported }
\fi

\subsection{Font loading}
Depending on the engine used by the user, we can use \texttt{fontspec} for loading fonts.

\ifltxengine
{ \ltxengine }
\else
\fi

\msg_warning:nn { seiifonts } { pdflatex-used }
\PassOptionsToPackage{T1}{fontenc}
\PassOptionsToPackage{scaled=0.9,varl}{inconsolata}
\PassOptionsToPackage{mono=false}{libertinus-type1}
\RequirePackage{fontenc}
\RequirePackage{inconsolata}
\RequirePackage{libertinus-type1}
\fi

\langle/
package\rangle

\end{definition}
6 se2packages implementation

Start the DocStrip guards.

Identify the internal prefix (LaTeX3 DocStrip convention): only internal material in this submodule should be used directly.

\ProvidesExplPackage{se2packages}{2024-06-25}{4.2.0}

(∗package)

Identify the package and give the overall version information.

\ProvidesExplPackage{se2packages}{2024-06-25}{4.2.0}

(Supporting packages for the se2thesis bundle)

6.1 Load-time options

Before we define the actual options, define some Boolean variables to store the selected values.

\bool_new:N \l__slcd_packages_csquotes_bool
\l__slcd_packages_csquotes_bool
\bool_new:N \l__slcd_packages_booktabs_bool
\l__slcd_packages_booktabs_bool
\bool_new:N \l__slcd_packages_siunitx_bool
\l__slcd_packages_siunitx_bool
\bool_new:N \l__slcd_packages_minted_bool
\l__slcd_packages_minted_bool
\bool_new:N \l__slcd_packages_listings_bool
\l__slcd_packages_listings_bool
\bool_new:N \l__slcd_packages_biblatex_tl
\l__slcd_packages_biblatex_tl
\bool_new:N \l__slcd_packages_selnolig_bool
\l__slcd_packages_selnolig_bool
\bool_new:N \l__slcd_packages_luawidowcontrol_bool
\l__slcd_packages_luawidowcontrol_bool

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Whether or not to load `microtype`.
\bool_new:N \l__slcd_packages_microtype_bool
(End of definition for \l__slcd_packages_microtype_bool)

Whether or not to load and configure `cleveref`.
\bool_new:N \l__slcd_packages_cleveref_bool
(End of definition for \l__slcd_packages_cleveref_bool)

Whether or not to load and configure all recommended packages.
\bool_new:N \l__slcd_packages_all_bool
(End of definition for \l__slcd_packages_all_bool)

Define the actual load-time options.
\keys_define:nn { seiipackages }
{
csquotes .bool_gset:N = \l__slcd_packages_csquotes_bool,
csquotes .initial:n = true,
nocsquotes .meta:n = {csquotes=false},
booktabs .bool_gset:N = \l__slcd_packages_booktabs_bool,
booktabs .initial:n = true,
nobooktabs .meta:n = {booktabs=false},
siunitx .bool_gset:N = \l__slcd_packages_siunitx_bool,
siunitx .initial:n = false,
minted .bool_gset:N = \l__slcd_packages_minted_bool,
minted .initial:n = false,
listings .bool_gset:N = \l__slcd_packages_listings_bool,
listings .initial:n = false,
biblatex .tl_gset:N = \l__slcd_packages_biblatex_tl,
biblatex .initial:n = false,
selnolig .bool_gset:N = \l__slcd_packages_selnolig_bool,
selnolig .initial:n = true,
noselnolig .meta:n = {selnolig=false},
widowcontrol .bool_gset:N = \l__slcd_packages_luawidowcontrol_bool,
widowcontrol .initial:n = false,
nowidowcontrol .meta:n = {widowcontrol=false},
microtype .bool_gset:N = \l__slcd_packages_microtype_bool,
microtype .initial:n = true,
nomicrotype .meta:n = {microtype=false},
cleveref .bool_gset:N = \l__slcd_packages_cleveref_bool,
cleveref .initial:n = false,
all .bool_gset:N = \l__slcd_packages_all_bool,
all .initial:n = false,
}
6.2 Option handling

\FormatAtLeastTF{2022-06-01}
{\ProcessKeyOptions{seiipackages}}
{\RequirePackage{l3keys2e}}
{\ProcessKeysOptions{seiipackages}}

Define an error message if both \texttt{minted} and \texttt{listings} are requested.
\msg_set:nnnn{seiipackages}{conflicting-packages}{Setting both \texttt{minted} and \texttt{listings} to \texttt{true} is not possible.}{Choose either of them!}

Define a message for logging that a specific package will be loaded by \texttt{se2packages}. Expects as parameter the name of the package that will be loaded.
\msg_new:nnn{seiipackages}{load-package}{se2packages loads the \#1 package now.}

And, in case both values are set to \texttt{true}, raise the error message.
\bool_lazy_and:nnT{l__slcd_packages_minted_bool}{l__slcd_packages_listings_bool}
{\msg_error:nn{seiipackages}{conflicting-packages}}

In case the \texttt{all} option is set, set all other values to \texttt{true}.
\bool_if:NT{l__slcd_packages_all_bool}

6.3 Package loading

Conditionally load the \texttt{csquotes} package.
\bool_if:NT{l__slcd_packages_csquotes_bool}
{\msg_info:nnn{seiipackages}{load-package}{csquotes}\RequirePackage{fvextra}\RequirePackage{csquotes}}

Conditionally load the \texttt{booktabs} package.
\bool_if:NT{l__slcd_packages_booktabs_bool}
{\msg_info:nnn{seiipackages}{load-package}{booktabs}\RequirePackage{booktabs}}
Conditionally load and configure the \texttt{siunitx} package.

\bool_if:NT \l__slcd_packages_siunitx_bool
{
  \msg_info:nnn { seiipackages } { load-package } { \texttt{siunitx} }
  \RequirePackage[
    add-integer-zero=false,
    free-standing-units=true,
    group-minimum-digits=4,
    list-final-separator={, and },
    round-mode=figures,
    round-precision=3,
    separate-uncertainty=true,
    uncertainty-mode=separate,
    mode=match,
  ]{siunitx}
}

Conditionally load and configure the \texttt{minted} package.

\bool_if:NT \l__slcd_packages_minted_bool
{
  \msg_info:nnn { seiipackages } { load-package } { \texttt{minted} }
  \RequirePackage[newfloat=true]{minted}
  \setminted{
    autogobble,
    breaklines=true,
    fontsize=\footnotesize,
    frame=single,
    linenos=false,
    resetmargins=true,
    xleftmargin=1em,
    xrightmargin=1em,
  }
}

Conditionally load and configure the \texttt{listings} package.

\bool_if:NT \l__slcd_packages_listings_bool
{
  \msg_info:nnn { seiipackages } { load-package } { \texttt{listings} }
  \RequirePackage{listings}
  \lstset{
    basicstyle=\footnotesize\ttfamily,
    breaklines=true,
    captionpos=t,
    extendedchars=true,
    frame=single,
    keywordstyle=\color{blue}\bfseries,
    showspaces=false,
    showtabs=false,
    showstringspaces=false,
    tabsize=2,
  }
}

Conditionally load \texttt{selinolig} if present and we run \LaTeX{}.

\bool_lazy_and:nnT { \l__slcd_packages_selinolig_bool } { \sys_if_engine_luatex_p: }
\IfFileExists { selnolig.sty } {
\RequirePackage{selnolig}
} {
\msg:nnnn { seipackages }
{ selnolig-not-available }
\msg_note:nn { seipackages } { selnolig-not-available }
}

\bool_lazy_and:nnT { \l__slcd_packages_luawidowcontrol_bool } { \sys_if_engine_luatex_p: }
\IfFileExists { lua-widow-control.sty } {
\RequirePackage{lua-widow-control}
} {
\msg:nnnn { seipackages }
{ lua-widow-control-not-available }
\msg_note:nn { seipackages } { lua-widow-control-not-available }
}

\bool_if:NT \l__slcd_packages_microtype_bool
\msg_info:nnn { seipackages } { load-package } { microtype }
\RequirePackage{microtype}
\bool_if:NF \l__slcd_packages_luawidowcontrol_bool
\clubpenalty=10000
\widowpenalty=10000
\displaywidowpenalty=10000
\SetExtraKerning{
encoding = {OT1,T1,T2A,LY1,OT4,QX,T5,TS1,EU1,EU2}}
\textemdash = {167,167},
— = {167,167}
\SetExtraKerning{
encoding = {OT1,T1,T2A,LY1,OT4,QX,T5,TS1,EU1,EU2}}
\textemdash = {167,167},
— = {167,167}
\SetExtraKerning{
encoding = {OT1,T1,T2A,LY1,OT4,QX,T5,TS1,EU1,EU2}}
\textemdash = {167,167},
— = {167,167}
\SetExtraKerning{
encoding = {OT1,T1,T2A,LY1,OT4,QX,T5,TS1,EU1,EU2}}
\textemdash = {167,167},
— = {167,167}

\tl_if_eq:NnT \l__slcd_packages_biblatex_tl {alphabetic}
\tl_if_eq:NnT \l__slcd_packages_biblatex_tl {alphabetic}

\PassOptionsToPackage{backend=biber, backref=true, datamodel=software, giveninits=true, hyperref=auto, maxnames=100, minalphanames=3, sorting=nyt, style=alphabetic,}{biblatex}
\RequirePackage{biblatex}
\RequirePackage{software-biblatex}
\ExecuteBibliographyOptions{
  halid=false, swhid=true, shortswhid=false, swlabels=true, vcs=true, license=true,
}
\bool_new:N \l__slcd_packages_biblatex_numeric_variants_bool
\tl_if_eq:NnT \l__slcd_packages_biblatex_tl {true}
{\bool_gset_true:N \l__slcd_packages_biblatex_numeric_variants_bool}
\tl_if_eq:NnT \l__slcd_packages_biblatex_tl {numeric}
{\bool_gset_true:N \l__slcd_packages_biblatex_numeric_variants_bool}
\bool_if:NT \l__slcd_packages_biblatex_numeric_variants_bool
{\msg_info:nnn {seiipackages} {load-package} {biblatex}
\PassOptionsToPackage{
  backend=biber, backref=true, citereset=chapter+, citetracker=context, giveninits=true, hyperref=auto, sorting=nyt, datamodel=acmdatamodel, style=acmnemonic,
}{biblatex}
\RequirePackage{biblatex}
\RequirePackage{ragged2e}
\RequirePackage[mark=arabic,shape=up,Ragged]{sidenotesplus}
\newbibmacro{cite:authoryear}{% 
\printtext[labelnumberwidth]{% 
\usebibmacro{cite}% 
}% 
\setunit{\addspace}% 
\printnames{labelname}% 
\setunit{\labelnamepunct}\newblock% 
\usebibmacro{year}% 
\newunit% 
\printfield{title}[labeltitle] }

\newrobustcmd*{\makebibmarginnote}{1}{% 
\sidenote{*}{\blx\mkbibnote{foot}{#1}}}

\DeclareCiteCommand{\maycite}{\makebibmarginnote}{% 
\usebibmacro{prenote}{\usebibmacro{citeindex}{\usebibmacro{cite:authoryear}{\multicitedelim}{\usebibmacro{postnote}{}}}}}

\newcommand*{\cbx@savedcites}{\empty}

\DeclareCiteCommand{\margincite}{\cbx@margcitewrap}{% 
\usebibmacro{prenote}{\usebibmacro{cite}{\ifciteseen{}{\xappto\cbx@savedcites{\maycite{\thefield{entrykey}}}}}{\multicitedelim}{\usebibmacro{postnote}{}}}}

\DeclareMultiCiteCommand{\margincites}{\cbx@margcitewrap}{\margincite}{\multicitedelim}

\DeclareAutoCiteCommand{margin}{\margincite}{\margincites}

\ExecuteBibliographyOptions{autocite=margin}

\newcommand{\bibliofont}{\footnotesize}

\DeclareFieldFormat{titlecase}{#1}% Preserve capitalisation of titles

\bool_if:NT \l__slcd_packages_cleveref_bool{\msg_info:nnn { seiipackages } { load-package } { cleveref } \AddToHook{begindocument/before}{\RequirePackage[capitalise]{cleveref}}}

Conditionally load the \texttt{cleveref} package as the last of the preamble.
The italic numbers denote the pages where the corresponding entry is described, numbers underlined point to the definition, all others indicate the places where it is used.

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