The `tktla` document class for series A reports in the University of Helsinki Department of Computer Science

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Abstract

This document describes the use and implementation of the `tktla` document class, meant for producing reports in report series A in the University of Helsinki Department of Computer Science (e.g., PhD theses). The document also contains some general tips for using LaTeX for long scientific documents such as PhD theses. However, the reader should be familiar with the basics of LaTeX before reading this document.

1 Introduction

The `tktla` document class defined by this LaTeX package is based on the standard LaTeX `book` document class, but makes some changes to the paper size and layout and loads a few useful packages not used by the standard `book` document class.

Thus, the `tktla` document class is used and customised like the standard `book` document class, with a couple of exceptions that are documented below.

2 Class options

The `tktla` document class has a couple of options, set via the `\documentclass` command. All the options of the `book` class are not directly available, since some of them do not make sense with the layout specified in this document class (for example, the paper size cannot be changed).

The layout defined by this class uses the B5 paper size. Since this is difficult to print using standard printers, the `a4frame`, `a4cross` and `a4cam` options can be used to print the B5-sized pages on A4 paper. The three options differ in the way the smaller page is framed: the `a4frame` option draws a box (frame) around the B5 page, while the `a4cross` and `a4cam` options draw different types of crop marks in the corners. If you specify neither option, B5-sized pages will be produced.

In this version of the package, there is only one layout defined called `officiallayout`. Please use this layout.

In addition to the options described above, the standard `book` document class options `draft`, `final`, `leqno`, `fleqn` and `openbib` are also supported. (The other `book` options do not make sense when using a prespecified layout.)

3 Document structure

A typical document that uses the `tktla` document class should set some bibliographic information in its preamble (before `\begin{document}`) – this is described in detail below. In addition, the beginning of the document (just after `\begin{document}`) should be structured as follows:

- first, just after `\begin{document}`, `\frontmatter` should be called to adjust the page numbering
- next, `\maketitle` should be used to produce the title and copyright pages
- after this, an abstract should be written between `\begin{abstract}` and `\end{abstract}` – this will produce the abstract page
- optionally, an acknowledgements page can be produced here using the `acknowledgements` environment (see below)
- next, the table of contents should be produced using the normal command `\tableofcontents`
- the `\listoffigures` and `\listoftables` commands can also be used, if such lists are necessary
- before the main document body (the first `\chapter`), the `\mainmatter` command should be used to adjust the page numbering back to Arabic numerals

A short example document that follows these guidelines is linked to below.

3.1 Details

`\frontmatter` `\mainmatter` `\backmatter` The `\frontmatter` and `\mainmatter` commands should be used as in the `book` document class: `\frontmatter` before `\maketitle` and `\mainmatter` just before the first actual chapter (after the table of contents). The `\backmatter` command also works as in the `book` document class, but it is normally not needed.

`\maketitle` The `\maketitle` command produces a title page and a page containing bibliographic information. The title page is designed to be inside a printed book – a cover should be produced separately.

`abstract` The `abstract` environment is used after `\maketitle` to produce the abstract for the thesis. The abstract is printed on its own page (or several pages), and some bibliographic information is printed before and after the actual text of the abstract.

Write the text of the abstract inside the abstract environment. The text is processed as LaTeX code just like the document body, so you can use any LaTeX commands that you need inside the abstract.

acknowledgements An optional acknowledgements page can be generated by placing the text of the acknowledgements inside the `acknowledgements` environment. This is normally placed between the abstract and the table of contents.

By default, the word "Acknowledgements" is printed at the top of the page (like a chapter heading). This text can be changed by giving an optional argument for the environment (e.g., `\begin{acknowledgements}[Preface]`), or removed by giving an empty optional argument (`\begin{acknowledgements}[]`). The last could be used for a page with only a dedication ("To my wife").

Multiple instances of the `acknowledgements` environment are allowed, producing separate pages (e.g., for printing both a dedication and a preface). As with the `abstract` environment, LaTeX commands can be used inside the environment normally.

3.2 Bibliographic information

The `tktla` document class includes a set of commands to set the bibliographic information for the publication. Some of these are mandatory, as listed below.

\author \title The author and title of the document are set with `\author` and `\title` as in the `article` and `book` document classes. The title is printed in two places: on the title page and at the top of the abstract page.

Line breaks in the title at the top of the abstract page are treated specially: the `\\` command is ignored there. Thus, if you want to manually set line breaks in the title on the title page but not on the abstract page, use `\\`. If you need a line break in both places, use another line-breaking command such as `\newline`.

\authorcontact More detailed contact information for the author is printed on the abstract page. The command to set this is `\authorcontact{`⟨*information*⟩`}`, where ⟨*information*⟩ typically contains the e-mail address of the author and possibly the address of a WWW home page. If you need a line break, use, for example, `\\` to produce it.

\pubtime \reportno The date of publication (used on the copyright page and to generate the report number) is set by the command `\pubtime{`⟨*month*⟩`}{`⟨*year*⟩`}`. The ⟨*month*⟩ should be an English month name. The report number in the Department of Computer Science series A (e.g., A-2009-1) is generated from the year and from the command `\reportno{`⟨*n*⟩`}`, where ⟨*n*⟩ should be just the last number ("1" in the above example).

\issn \isbnpaperback \isbnpdf \isbnhtml ISBN and ISSN numbers printed on the title pages are set using the commands `\issn`, `\isbnpaperback`, `\isbnpdf` and `isbnhtml`. The `\issn` command sets the ISSN number (the default is 1238-8645, the number used in previous series A reports) to its argument. The ISBN numbers for different versions are set via the other commands; normally, at least `\isbnpaperback` should be set. All of the commands take one argument, which is the number to be used. If one of the commands (such as `\isbnhtml`) is not used, the ISBN number for this version is simply not printed at all.

\pubpages The `\pubpages{`⟨*pages*⟩`}` command should be used to set the page count printed on the abstract page. Note that the number pages for monographs should be the number of the last page of the list of references (for example, 150 pages), and for article-based theses the number of the last page of the list of references + the total number of the pages of the original articles and the interleaf pages between them (for example, 75+60 pages).

\crcshort \crclong The Computing Reviews classification printed on the copyright and abstract pages is set via the \crcshort and \crclong commands. Note that the command \crcshort should only be used, if the Computing Reviews of 1998 are used.

When using the Computing Reviews of 1998, the list of classes printed on the copyright page is set using \crcshort to a comma-separated list (e.g., \crcshort{A.0, C.0.0}), while the longer list printed on the abstract page is set via \crclong. The classes in both lists should naturally be the same.

When using the Computing Reviews of 1998, the argument of \crclong works like the contents of the standard description environment: the argument should contain a number of commands of the form "\item[⟨*class*⟩] ⟨*class name*⟩". For example,

```
\crclong{
\item[A.0] Example Category
\item[C.0.0] Another Example
}
```

When using the Computing Reviews of 2012, the argument of \crclong works like the contents of the standard description environment: the argument should contain a number of commands of the form "\item ⟨*class name*⟩". For example,

```
\crclong{
\item Example Category $\rightarrow$ And its subcategory
      $\rightarrow$ And sub-subcategory
\item Another Example $\rightarrow$ And its subcategory
}
```

\generalterms \additionalkeywords The general terms and additional keywords printed on the abstract page after the Computing Reviews classification are set with the commands \generalterms and \additionalkeywords, both of which take one argument (the text of the terms and keywords).

\printhouse The one-argument \printhouse command is used to set the name of the printing house, which will be printed on the copyright page.

\permissionnotice An optional "permission notice" can be printed on the title page using the \permissionnotice command. The argument is printed in italic in a separate paragraph below the author's name. If the command is not used, nothing is printed there.

\copyrighttext The copyright notice printed on the title page is "Copyright © ⟨*year of publication*⟩ ⟨*name of author*⟩" by default. The \copyrighttext command can be used to change this default text; the single argument is the new text. You can include multiple lines (\par starts a new line) if necessary. Use \copyright{} for the copyright symbol ©.

\pubtype Finally, the \pubtype command can optionally be used to set the name of the type of publication printed on the abstract page; the default is “PhD thesis”.

The mandatory commands are `\author`, `\title`, `\authorcontact`, `\pubtime`, `\reportno`, `\pubpages`, `\crclong`, `\generalterms` and `\additionalkeywords`.

3.3 An example

An example document using the `tktla` document class is given in the file `example.tex` distributed with the document class.

4 Preloaded packages

The `tktla` document class loads and uses the following additional packages (as well as the standard `book` document class):

tocbibind with the `nottoc` option, for including the bibliography and a possible index in the table of contents.

titlesec to make customising the layout of the chapter and section headings easy. This package is used to modify the default layout of the `book` class.

fancyhdr for customising the layout of the running heads. This package is used to modify the default layout of the `book` class.

In addition, if the `a4frame`, `a4cross` or `a4cam` options are specified, the `crop` package is loaded to implement these options.

5 The layout provided by this class

The official layout selected by the `officiallayout` option is the layout traditionally used in most of the PhD theses of the department. It is not very much modified from the LaTeX `book` class 11 pt defaults; the most important changes include the text size (125 mm by 195 mm plus the header – with the header, the textblock proportions are close to the golden section 1 : 1.618) and the size of the chapter heading (`\huge` font instead of the default `\Huge`).

The text height is 39 lines plus two header lines (the page header and an empty separator line), or about 201 mm, which gives a 5 : 9 proportion for the textblock – one of the many textblock proportions conventionally used in typography. The margins are 30 mm inside, 34 mm outside, 19 mm top and 30 mm bottom. The 5 : 9 proportion was also used for the spacing around chapter and section headings.

In the interest of consistency, horizontal space was assigned in integer multiples of the leading (14 pt) for the paragraph indentation (14 pt) and for the lists in the copyright and abstract pages. If you design your own indented material, you could consider using the same indents: 14 pt, 28 pt and 70 pt from the left margin. A half-line (i.e., 7 pt) or a full line (14 pt) might be good amounts for the vertical spacing around an element.

The layout of the table of contents and the `itemize`, `description` and `enumerate`environments is the LaTeX `book` class default layout. In a future version of this document class, these should perhaps be designed to be more consistent with the spacing described above.

6 Modifying the layout

If you wish to customize the layout, you should probably first read the implementation documentation below, as well as the documentation for the `titlesec` and `fancyhdr` packages that were used to change the layout. See also the above description of the layout, which has some ideas for modification and extension.

Most things can be changed by adding customization in your document preamble (e.g., by copying and modifying the definitions in this document class), but sometimes you may need to change this document class. You can either change the `tktla.dtx` file (which is the actual source file) and regenerate the `tktla.cls` using the instructions in `readme.txt`, or change `tktla.cls` directly.

If you wish to change the font, use one of the LaTeX font packages (like `utopia`) or redefine `\rmdefault`, `\sfdefault` and `\ttdefault` yourself (e.g., `\renewcommand{\rmdefault}{put}`). If you use a lot of mathematics, you should also find a matching font for them; there are some ready-made LaTeX packages with such fonts, such as `fourier` for Utopia, `mathpazo` and `eulervm` for Palatino, and `mathptmx` for Times.

If you wish to redesign the table of contents, the `titletoc` package (documented in the `titlesec` documentation) provides an interface to change the layout.

7 LaTeX tips

7.1 Figures and such

The `graphicx` package allows for easy inclusion of images in various file formats, e.g., with `\includegraphics{file.eps}`. The most common way to include figures is `\usepackage{graphicx}` and:

```
\begin{figure}
\centering\includegraphics{file.eps}
\caption{Caption for figure}
\label{fig:label}
\end{figure}
```

(You can leave out the `\label` if you do not need to refer to the figure using `\ref`.) If you do not want a figure to move around the page, you can, for example, replace the `figure` environment with a `center` environment and leave out the `\centering` and the caption and label.

If you want to use both `pdflatex` (which supports PDF but not EPS images) and normal `latex` (which supports EPS but not PDF), you can convert your figures to PDF format (e.g., using the `epstopdf` program) and leave out the extension in `\includegraphics`: `\includegraphics{file}` is smart enough to search for `file.eps` in `latex` and `file.pdf` in `pdflatex`.

If you need a figure with "sub-figures" (e.g., parts (a) and (b) in a single figure), the `subfigure` package gives an easy way of creating and referring to them. The `amsmath` package has a similar feature for numbered equations.

Finally, if you want a new floating environment (like `figure` or `table`) with its own numbering, use the `float` package and read its documentation.

7.2 Theorems and proofs

The basic LaTeX `\newtheorem` command works quite well for the layout of normal theorems. If you want to change the layout of theorems, see the `ntheorem` or `amsthm` package.

Proofs can be set either as is (using `\textbf` or `\textit` or even `\paragraph` for the text "Proof."), or by using a custom environment. The box symbol that ends a proof is available as `\Box` in the `latexsym` package. Also, the `amsthm` package defines a ready-made `proof` environment.

7.3 Algorithms

A very useful package for typesetting Pascal-style pseudocode is `algorithms`, which provides the `algorithm` and `algorithmic` environments. See the documentation for details and examples. (There was a licensing problem with the package, which may mean that it is not included with all versions of LaTeX distributions. However, the problem has apparently been resolved, and the package is available in, e.g., `http://tug.ctan.org/tex-archive/macros/latex/contrib/algorithms`.) There are also quite a few other packages for pseudocode, and it is not difficult to write small amounts of pseudocode "manually", e.g., with the `flushleft` environment, `\\` for linebreaks and `\quad` for indentation.

For actual program code (instead of pseudocode), the easiest solution is probably the standard `verbatim` environment. Others are the `Verbatim` (capital V) environment in the `fancyvrb` package, which is much more flexible, and the `listings` package, which is tailored for source code and can do syntax highlighting.

7.4 Other useful packages

Some of the most useful add-on packages for LaTeX are:

inputenc allows the direct input of 8-bit characters. The `latin1` option (`\usepackage[latin1]{inputenc}`) uses the ISO 8859-1 character set. Newer versions also have a `latin9` option for the ISO 8859-15 character set.

url provides for more intelligent layout of URLs with the `\url` command. For example, it can break URLs across lines at the '/' characters. Set `\urlstyle{same}` in the preamble if you do not want the URLs to be set in the typewriter font.

hyperref produces hyperlinks in PDF documents, both inside the document (e.g., from the table of contents to the appropriate pages) and outside (when `\url` is used).

Many LaTeX experts recommend `\usepackage[T1]{fontenc}` in the preamble. This switches to a different internal enconding of the fonts, often also using a different set of font files. It fixes some problems in character spacing and, most notably, allows hyphenation of words that contain non-ASCII characters (very useful for Finnish text). However, since it uses different font files internally, there have been some problems with it in various older LaTeX distributions, notably that the produced documents may include bitmapped instead of vectored fonts. You should probably try it out in the version of LaTeX that you use, and if it seems to work, use it in just about every document that you produce.

7.5 Obsolete commands

This section notes a few commands that have been obsolete for a long time but are still commonly used. The newer versions should generally work better – the obsolete commands may can cause strange effects in certain circumstances.

The two-character TeX font changing commands `\em`, `\bf`, `\tt`, etc. should not be used in LaTeX documents (after LaTeX2$_\epsilon$ was released in 1993). There are two versions of the new commands: commands like `\emph{foo}`, `\textit{foo}`, `\textsc{foo}`, `\textbf{foo}` and `\texttt{foo}` (note the three 't's), and declarations like `\itshape`, `\scshape`, `\bfseries` and `\ttfamily` (used as, e.g., `{\itshape foo}`). They can also be combined: for instance, command `\textbf{\textit{foo}}` produces bold italic. See any recent LaTeX reference for details.

The `epsfig` package and its `\epsfig` and `\psfig` commands for including EPS figures have been replaced (in about 1994) by the `graphicx` package and its more generic `\includegraphics` command. Use `\usepackage{graphicx}` and `\includegraphics{foo.eps}` instead, and see grfguide.ps and epslatex.ps in texmf/doc/latex/graphics for more information.

8 Version history

v0.9 2004/04/21 Initial draft version.

v0.9b 2004/07/05 Another draft.

v0.9c 2004/08/03 Another draft.

v1.0 2004/11/07 Final version by Riku Saikkonen. Finished documentation. Support for newer versions of `titlesec` and `crop` by guessing versions. Slight corrections in the layout.

v1.0b 2004/11/08 Bugfix: did not work without an `a4frame`-like option.

v1.1 2009/02/17 New layout removed. Greger Lindén. There is now only one official layout version

v1.2 2011/02/11 Supervisor's, pre-examiners', opponent's and custos' names added to contact page. Greger Lindén

v1.3 2011/02/23 Supervisor's, pre-examiners', opponent's and custos' names, additional formatting. Greger Lindén

v1.4 2012/08/14 New version of the URL of the Department. Pirjo Moen

v1.5 2013/08/16 More detailed instructions on the number pages for the abstract page added. Pirjo Moen

v1.6 2014/06/25 New telephone numbers. Pirjo Moen

v1.7 2014/11/13 New fax number. Pirjo Moen

v1.8 2018/04/27 New computing reviews version into use, new version of the URL of the Department, and fax number removed. Pirjo Moen

9 Implementation details

This section contains the documented source code for this class, documented in literate programming style. It is probably of interest only if you wish to modify the class or customize the layout.

9.1 Initialization

Version number announcements. We don't need a specially new version of LaTeX.

```
\NeedsTeXFormat{LaTeX2e} \ProvidesClass{tktla}[2009/02/17 v1.1 Series
A Report for the University of Helsinki Department of Computer
Science]
```

9.2 Option processing

The `officiallayout` option is defined here, setting a variable `\tktla@layout` that will be queried later. The `\newcommand` also sets the default layout (0 = `officiallayout`).

```
\newcommand{\tktla@layout}{0}
\DeclareOption{officiallayout}{\renewcommand{\tktla@layout}{0}}
```

The a4frame, a4cross and a4cam options also simply set a variable that will be used later. Here the default is to leave the variable undefined, which will mean that none of the options will be used.

```
\DeclareOption{a4frame}{\newcommand{\tktla@afour}{1}}
\DeclareOption{a4cross}{\newcommand{\tktla@afour}{2}}
\DeclareOption{a4cam}{\newcommand{\tktla@afour}{3}}
```

The following options are passed directly to the book class that will be loaded later.

```
\DeclareOption{draft}{\PassOptionsToClass{\CurrentOption}{book}}
\DeclareOption{final}{\PassOptionsToClass{\CurrentOption}{book}}
\DeclareOption{leqno}{\PassOptionsToClass{\CurrentOption}{book}}
\DeclareOption{fleqn}{\PassOptionsToClass{\CurrentOption}{book}}
\DeclareOption{openbib}{\PassOptionsToClass{\CurrentOption}{book}}
```

Finally, any options given by the user are actually executed (processed).

```
\ProcessOptions\relax
```

9.3 Class and package loading

First of all, the standard book class is loaded with the b5paper and 11pt options (to produce the required layout). The logical paper size is always B5 (even with the A4 framing options).

```
\LoadClass[b5paper,11pt]{book}
```

Next, an actual B5 paper size (176×250 mm) is declared using a \special directive – this allows dvips and pdflatex to produce the correct paper size. The book document class does not do this by default for historical reasons. (The geometry package would, but it is perhaps simpler to do it directly here.)

The \ifx is used for declaring the B5 paper size only if the A4 framing options are not used (i.e., if \tktla@afour is undefined). The \relax in the else branch is a no-op.

```
\ifx\tktla@afour\@undefined\special{papersize=176mm,250mm}\else\relax\fi
```

Next, two packages are loaded: tocbibind to get the bibliography into the table of contents, and fancyhdr for setting page headers (done later).

```
\RequirePackage[nottoc]{tocbibind}
\RequirePackage{fancyhdr}
```

The following code loads the titlesec package and, if an A4 framing option was selected, the crop package.

There is a problem with supporting different versions of these packages, as there have been incompatible changes in the option syntax of both packages: titlesec apparently changed at around 1999/11/03 and crop on 2001/10/07. LaTeX does not seem to have a command to check the version of a package before it has been loaded (nor to change options afterwards), so the following code guesses: if the standard book class (which was loaded above) is dated later than 2001/04/21, the new option syntax is used for both packages. (Version 1.4d of the book class is dated 2001/04/21, and the next one, 1.4e, is dated 2001/05/24, so the guess here is that a LaTeX distribution with a book class newer than v1.4d also contains versions of titlesec and crop with the newer option syntax.)

The inner \ifcase statements are used to give appropriate options to the crop package to implement the various kinds of framing that this class (and the crop package) supports. The \ifx checks if the internal variable is defined, and if yes, the \ifcase goes through all relevant values (the first branch of the \ifcase statement applies for the value 0, which is not possible, so nothing is done).

```
\@ifclasslater{book}{2001/04/21}{
  \RequirePackage[nonindentfirst]{titlesec}
  \ifx\tktla@afour\@undefined\relax\else\ifcase\tktla@afour% 0=nothing
  \or% 1=a4frame
    \RequirePackage[frame,a4,center]{crop}
  \or% 2=a4cross
    \RequirePackage[cross,a4,center]{crop}
  \or% 3=a4cam
    \RequirePackage[cam,a4,center]{crop}
  \fi\fi
}{
  \RequirePackage[nops,nonindentfirst]{titlesec}
  \ifx\tktla@afour\@undefined\relax\else\ifcase\tktla@afour% 0=nothing
  \or% 1=a4frame
    \RequirePackage[frame,a4center]{crop}
  \or% 2=a4cross
    \RequirePackage[cross,a4center]{crop}
  \or% 3=a4cam
    \RequirePackage[cam,a4center]{crop}
  \fi\fi
}
```

9.4 Settings

The following code sets the title of the bibliography to “References” instead of the book class default “Bibliography”, as is the custom in the theses in this department.

```
\renewcommand{\bibname}{References}
```

If the babel package is loaded by the document, the preceding command is not enough, since babel changes all these titles when the language is changed (which is possible also in the middle of the document). The following code should work in all cases, but it needs to set the title separately for each language. (The code will be stored to be executed at \begin{document}, and it checks if the babel package has been loaded, doing nothing if not.)

```
\AtBeginDocument{\@ifpackageloaded{babel}{%
    \addto{\captionsenglish}{\renewcommand{\bibname}{References}}%
    \addto{\captionsUKenglish}{\renewcommand{\bibname}{References}}%
    \addto{\captionsbritish}{\renewcommand{\bibname}{References}}%
    \addto{\captionsUSenglish}{\renewcommand{\bibname}{References}}%
    \addto{\captionsamerican}{\renewcommand{\bibname}{References}}%
```

```
    \addto{\captionscanadian}{\renewcommand{\bibname}{References}}{}\relax}
```

9.5 Prelims

The code in this section is used to set the information in the prelims (title page, copyright page, abstract page). First, the `acknowledgements` environment is defined, simply to use `\chapter*` with empty page headers.

```
\newenvironment{acknowledgements}[1][Acknowledgements]{%
  \chapter*{#1}\markboth{}{}}{\clearpage}
```

Next, the mandatory commands for bibliographic information are defined. Each of these is defined the same manner: calling, for example, `\authorcontact{foo}`, defines the macro `\tktla@authorcontact` to `foo`, and this macro is used later to provide the necessary information. Thus, if the mandatory command was not used, an error message is produced by LaTeX, complaining of an undefined macro when the text is needed. Double braces `{{#1}}` are used to prevent possible font changing commands etc. from affecting anything outside of the user-settable text.

```
\newcommand{\authorcontact}[1]{
  \newcommand{\tktla@authorcontact}{{#1}}}
\newcommand{\pubtime}[2]{
  \newcommand{\tktla@pubmonth}{{#1}}
  \newcommand{\tktla@pubyear}{{#2}}}
\newcommand{\reportno}[1]{\newcommand{\tktla@pubno}{{#1}}}
\newcommand{\isbnpaperback}[1]{\newcommand{\tktla@isbnpaperback}{{#1}}}
\newcommand{\issn}[1]{\newcommand{\tktla@issn}{{#1}}}
\newcommand{\pubpages}[1]{\newcommand{\tktla@pages}{#1}}
\newcommand{\generalterms}[1]{\newcommand{\tktla@generalterms}{{#1}}}
\newcommand{\additionalkeywords}[1]{
  \newcommand{\tktla@additionalkeywords}{{#1}}}
\newcommand{\crcshort}[1]{\newcommand{\tktla@crcshort}{{#1}}}
\newcommand{\crclong}[1]{\newcommand{\tktla@crclong}{#1}}
```

Commands for optional bibliography information are defined in the following. This is done as above, except that we provide a default value with `\newcommand` and use `\renewcommand` to change it. The `\@author` used in the copyright message is defined by the standard `\author` command in the `book` document class.

```
\newcommand{\tktla@pubtype}{PhD Thesis}
\newcommand{\pubtype}[1]{\renewcommand{\tktla@pubtype}{{#1}}}
\newcommand{\tktla@copyright}{
  Copyright \copyright{} \tktla@pubyear{} \@author}
\newcommand{\copyrighttext}[1]{\renewcommand{\tktla@copyright}{{#1}}}
```

The `\supervisorlist` and some other non-mandatory commands use a slightly different implementation: instead of providing an empty default, the command is defined like a mandatory command but the existence of the defined variable (macro) is checked when the data is used. Double braces are not used in `\supervisorlist` because the argument is used inside a custom `list` environment with no other contents.

```
\newcommand{\supervisorlist}[1]{\newcommand{\tktla@supervisorlist}{#1}}
```

```
\newcommand{\preexaminera}[1]{\newcommand{\tktla@preexaminera}{#1}}
\newcommand{\preexaminerb}[1]{\newcommand{\tktla@preexaminerb}{#1}}
\newcommand{\opponent}[1]{\newcommand{\tktla@opponent}{#1}}
\newcommand{\custos}[1]{\newcommand{\tktla@custos}{#1}}
\newcommand{\printhouse}[1]{\newcommand{\tktla@printhouse}{{#1}}}
\newcommand{\permissionnotice}[1]{\newcommand{\tktla@permission}{{#1}}}
\newcommand{\isbnpdf}[1]{\newcommand{\tktla@isbnpdf}{{#1}}}
\newcommand{\isbnhtml}[1]{\newcommand{\tktla@isbnhtml}{{#1}}}
```

9.6 The layout

This class specifies one official layout, and the code below is used to implement it. First a bit of code: the `\maketitle` command is redefined in terms of two class-internal commands defined below:

```
\renewcommand{\maketitle}{
  \tktla@titlepage
  \tktla@copyrightpage
}
```

The following internal macro is used to make the code below shorter. It prints the various ISSN and ISBN numbers used in the bibliographic information. Lines for PDF and HTML versions are skipped if the appropriate ISBNs have not been given via the bibliographic information commands.

```
\newcommand{\tktla@printisxns}{
  ISSN \tktla@issn\par
  ISBN \tktla@isbnpaperback{} (paperback)\par
  \ifx\tktla@isbnpdf\@undefined\relax\else
    ISBN \tktla@isbnpdf{} (PDF)\par
  \fi
  \ifx\tktla@isbnhtml\@undefined\relax\else
    ISBN \tktla@isbnhtml{} (HTML)\par
  \fi
}
```

Here follow the implementations of the official layout. Some information is repeated in the documentation in both sections to allow them to be read independently.

9.6.1 The official layout

The `officiallayout` option is implemented in this section. First, an `\ifcase` statement differentiates between layouts; the branch that begins here is for the value 0 of `\tktla@layout`, which was set above when the `officiallayout` option was used.

```
\ifcase\tktla@layout
```

The implementation of the official layout begins by setting the margins and text size: 27 mm outer, 24 mm inner, 21 mm top, textblock size 125 by 195 mm plus a header line with an empty line separating the header and textblock. We subtract

1 inch from the margins to give more understandable values here, as the origin in LaTeX margin settings is at (1 in, 1 in).

```
\setlength{\oddsidemargin}{27mm}
\addtolength{\oddsidemargin}{-1in}
\setlength{\evensidemargin}{24mm}
\addtolength{\evensidemargin}{-1in}
\setlength{\topmargin}{21mm}
\addtolength{\topmargin}{-1in}
\setlength{\headheight}{15pt}
\setlength{\headsep}{13.6pt}
\setlength{\footskip}{22pt}
\setlength{\textwidth}{125mm}
\setlength{\textheight}{195mm}
```

The following code sets the header and footer using the commands defined by the `fancyhdr` package. The `\nouppercase` command is used to avoid an all-caps header in some cases. (The syntax is read as follows: the **r**ight side of **o**dd pages and the **l**eft side of **e**ven pages contains just the page number, while the other sides contain the left-page (chapter name) or right-page (section name) mark.)

```
\fancyhf{}
\fancyhead[RO,LE]{\thepage}
\fancyhead[RE]{\textsc{\nouppercase{\leftmark}}}
\fancyhead[LO]{\nouppercase{\rightmark}}
\renewcommand{\headrulewidth}{0pt}
\renewcommand{\footrulewidth}{0pt}
\pagestyle{fancy}
```

The official layout specifies only one change from the LaTeX default headings: the size of the chapter heading is changed from the default `\Huge` to the smaller `\huge`. This is done as follows using the interface provided by the `titlesec` package.

```
\titleformat{\chapter}[display]%
              {\huge\bfseries\filright}{\chaptername~\thechapter}{20pt}{}
```

The title page is defined next. The simple centered layout is implemented by using `\centering` and setting the `\parindent` and `\parskip` to zero (inside braces, so the settings won't affect the other pages). The `\vspace` commands are used to move vertically, and a paragraph break (`\par`) starts a new line. The permission notice, if one has been provided, is included in a 98 mm wide `minipage` environment. The `\@title` is defined by the standard `\title` command in the `book` document class. (The `\tktla@titlepage` and `\tktla@copyrightpage` commands are called from `\maketitle`, which was redefined above.)

When the font, centering, etc. is locally changed, it is important to place the end of the paragraph (explicit `\par` here) inside the braces where the change is made. Otherwise the change will be ignored when, for example, the line spacing is calculated.

```
\newcommand{\tktla@titlepage}{
  \cleardoublepage
  \thispagestyle{empty}
  {\centering\setlength{\parindent}{0pt}\setlength{\parskip}{0pt}
```

```
    {\scshape\small
      Department of Computer Science\par
      Series of Publications A\par
      Report A-\tktla@pubyear-\tktla@pubno\par}
    \vspace{\fill}
    {\bfseries\Large\@title\par}
    \vspace{25mm}
    {\Large\@author\par}
    \vspace{25mm}
    \ifx\tktla@permission\@undefined\relax\else
      \begin{minipage}{98mm}
        \itshape\small\tktla@permission\par
      \end{minipage}
      \par
    \fi
    \vspace{\fill}
    {\scshape\small
      University of Helsinki\par
      Finland\par}
  }
  \clearpage
}
```

The copyright page also contains a list of contact information. The layout is created like the title page, but using `\raggedright` instead of `\centering`. Thus, a paragraph break (`\par`) can be used to move to the start of the next line. An empty line is produced using `\quad\par`, since completely empty paragraphs are ignored by LaTeX.

The address in the contact information is indented with a simple `\quad`. Accented characters in the address are produced with the verbose `{\"a}` syntax so that this class file remains 7-bit ASCII (otherwise, the character set should be set using the `inputenc` package).

```
\newcommand{\tktla@copyrightpage}{
  \clearpage
  \thispagestyle{empty}
  {\raggedright\setlength{\parindent}{0pt}\setlength{\parskip}{0pt}
    {\bf Supervisor} \par
    \quad \hangindent=1em \tktla@supervisorlist\par
    \quad\par
    {\bf Pre-examiners} \par
    \quad \hangindent=1em \tktla@preexaminera\par
    \quad \hangindent=1em \tktla@preexaminerb\par
    \quad\par
    {\bf Opponent} \par
    \quad \hangindent=1em \tktla@opponent\par
    \quad\par
    {\bf Custos} \par
    \quad \hangindent=1em \tktla@custos\par
    \quad\par
```

```
    \quad\par
    \vspace{\fill}
    {\bf Contact information\par}
    \quad\par
    \quad Department of Computer Science\par
    \quad P.O. Box 68 (Gustaf H{\"a}llstr{\"o}min katu 2b)\par
    \quad FI-00014 University of Helsinki\par
    \quad Finland\par
    \quad\par
    \quad Email address: info@cs.helsinki.fi\par
    \quad URL: http://cs.helsinki.fi/en/\par
    \quad Telephone: +358 2941 911\par
    \quad\par

    \vspace{\fill}
    \tktla@copyright\par
    \tktla@printisxns{}
    Helsinki \tktla@pubyear\par
    \ifx\tktla@printhouse\@undefined\relax\else\tktla@printhouse\par\fi
  }
  \clearpage
}
```

The abstract page is created from the `abstract` environment, which also creates the other information on the page. The information before and after the actual abstract is set using the `\raggedright` command, just as on the copyright page above.

```
\newenvironment{abstract}{%
  \cleardoublepage
  \thispagestyle{plain}
  {\raggedright\setlength{\parindent}{0pt}\setlength{\parskip}{0pt}
```

Line breaks in the title (the standard `\title` command defines `\@title`) that were set using `\\` are ignored simply by redefining the `\\` command (which has one optional argument) to do nothing for the duration of printing the title.

```
    {\bfseries\large\renewcommand{\\}[1][]{}\@title\par}
    \quad\par
    \@author\par
    \quad\par
    Department of Computer Science\par
    P.O. Box 68, FI-00014 University of Helsinki, Finland\par
    \tktla@authorcontact\par
    \quad\par
    \tktla@pubtype, Series of Publications A, Report
      A-\tktla@pubyear-\tktla@pubno\par
    Helsinki, \tktla@pubmonth{} \tktla@pubyear, \tktla@pages{} pages\par
    \tktla@printisxns
    \quad\par
    \textbf{Abstract}\par
  }
```

The actual abstract will be placed just after the following code, which places it in its own group and sets paragraph spacing as specified by the layout. (The `\begingroup` works just like the opening brace `{`, but the brace cannot be used here, as the corresponding closing brace needs to be in another argument of `\newenvironment{abstract}`.)

```
    \begingroup
      \setlength{\parindent}{0pt}
      \setlength{\parskip}{\baselineskip}
  }{%
    \par\endgroup
```

The following information is set after the actual abstract. A custom `list` environment is used for the long classification, but the other information can be set more simply. In the custom `list`, the `\makelabel` is redefined to produce left-justified labels.

```
    {\raggedright\setlength{\parindent}{0pt}\setlength{\parskip}{0pt}
      \quad\par
      \textbf{Computing Reviews (2012) Categories and Subject \\
        Descriptors:}\nopagebreak
      \begin{list}{}{
          \setlength{\partopsep}{0pt}
          \setlength{\topsep}{0pt}
          \setlength{\leftmargin}{3em}
          \setlength{\itemsep}{0pt}
          \setlength{\parsep}{0pt}
          \setlength{\labelsep}{0.5em}
          \setlength{\labelwidth}{2.5em}
          \renewcommand{\makelabel}[1]{##1\hspace{\fill}}}
        \tktla@crclong
      \end{list}
      \quad\par
      \textbf{General Terms:}\par\nopagebreak
      \tktla@generalterms\par
      \quad\par
      \textbf{Additional Key Words and Phrases:}\par\nopagebreak
      \tktla@additionalkeywords\par
    }
    \clearpage
  }
```

This ends the implementation of the official layout.

9.7 Code after the definition of the official layout

The following code needs to be placed after the definitions done by the official layout.

The `\chaptermark` and `\sectionmark` are redefined the same way in the layout: to remove the dot after the section number and the default “Chapter” text in the header.

```
\renewcommand{\chaptermark}[1]{\markboth{\thechapter~#1}{}}
\renewcommand{\sectionmark}[1]{\markright{\thesection~#1}}
```

The implementation of the `tktla` document class ends here.