

Instructions to use DIKU style files

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Abstract. Each write-up must include an abstract that summarizes the aims, scope, results, and conclusions. Recommended length is at most 150 words. The abstract should not contain any references or displayed equations. \LaTeX environment is `abstract`.

CR Classification. The document can be classified using the ACM Computing Classification System (see the appropriate issue of *Computing Reviews*), but this is not obligatory. \LaTeX environment is `subject`.

Keywords. List of keywords (4–6) can be useful but not obligatory. \LaTeX environment is `keywords`.

1. Introduction

We encourage the students to use \LaTeX when preparing their documents—assignments, reports, papers, and theses. For this purpose we provide the \LaTeX style files `DIKU-article.cls` and `DIKU-report.cls`, and the Bib \TeX style files `DIKU.bst` and `DIKU-alternative.bst`. This document describes how these style files are to be used.

2. General

The \LaTeX style files `DIKU-article.cls` and `DIKU-report.cls` do not accept any options. In `\documentstyle` command all options given in brackets are simply omitted. The page layout should not be changed in any way.

Redundant spaces ought to be minimized by careful arrangement of tables and figures. Read your `.log` file carefully. There should be no `Overfull \hbox` (as here) and certainly no visible one (more than `1pt`). If necessary, reword the text. The preamble command `\draft` can be used to produce a visible `overfullrulebox` in the margin.

The style files provide macros to create running heads. The `\authorhead` contains the authors' names as "Firstname Surname", "F. Surname1, F. Surname2", and "F. Surname1, F. Surname2, F. Surname3" for up to three authors, and "Surname1 et al." for four or more authors. The `titlehead` should contain a short form of the title, not more than 30 characters.

The argument of `\title` command must be written in sentence case (capitalize only the first word, proper nouns, and as dictated by other specific rules). When the paper has more than one author, the authors in the argument of `\author` command are separated by usual `\and` command or by `\AND` command that inserts vertical glue between the blocks of authors' names. Affiliations should be given using `\institute` command. Also here `\and` command can be used as in `\author` command. In a multi-author paper, to link the authors and their affiliations `\inst` command can be used, e.g. `\inst{1}` produces the superscript ¹.

The use of footnotes and appendices should be avoided. However, if appendices are necessary, their place is after **Acknowledgements** and before **References**.

3. Sectioning, numbering, etc.

3.1 Sectioning

The following three L^AT_EX sectioning commands are available: `\section`, `\subsection`, and `\subsubsection`. Use also sentence case in all headings.

3.2 Numbering

The numbering of displayed equations, theorems, figures, tables, and other "numbered" environments follows one of two styles: either consecutive in each section, or consecutive through the whole paper (default). If you prefer the first style, the style provides `\twolevelnumbering` command. The argument of the command is a list of environments that are numbered consecutively in each section, e.g.

```
\twolevelnumbering{figure,equation,theorem}
```

Figures should be referred to in the form "Figure 1", tables in the form "Table I", and equations in the abbreviated form "Eq. (1)". Use macros `\figref{fig-label}`, `\tableref{tab-label}`, and `\eqnref{eqn-label}` to generate the numbers for these references. Using the `hyperref` package, the references will be automatically linked to their corresponding targets.

3.3 Lists of items

The depths of L^AT_EX environments `itemize` and `enumerate` are restricted to two.

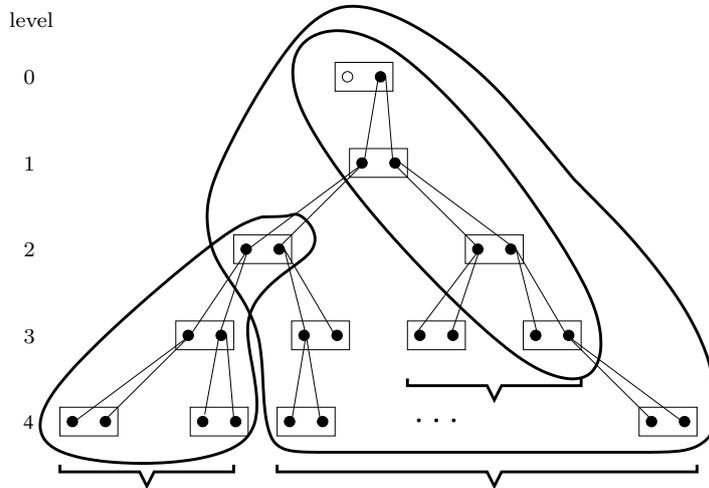


Figure 1. This drawing was created with `xfig` and converted to PDF/L^AT_EX format. Then the L^AT_EX part was inputted which further included the PDF part.

3.4 *Tabbing environment*

The style files define `\tabbingstretch` to specify the strut to be used in the `\tabbing` environment. The functionality of `\tabbingstretch` is the same as that of `\arraystretch` in `array` and `tabular` environments.

4. Theorem-like environments

The style files define the following theorem-like environments:

<code>theorem</code>	<code>proposition</code>	<code>claim</code>	<code>fact</code>
<code>lemma</code>	<code>definition</code>	<code>problem</code>	<code>remark</code>
<code>corollary</code>	<code>conjecture</code>	<code>example</code>	<code>observation</code>

These are “numbered” environments. The style files also define the corresponding “unnumbered” environments: `theorem*`, ..., `observation*`. The proofs can be typed within the environment `proof`.

For example, the L^AT_EX source

```
\begin{theorem}[Chebychev's Inequality]
If  $X$  is any random variable, then
\begin{equation}
\Pr[|X| \geq a] \leq \mbox{E}(X^2)/a^2;
\label{eqn:example}
\end{equation}
\end{theorem}
```

produces

Theorem 1. (Chebychev's Inequality) *If X is any random variable, then*

$$\Pr[|X| \geq a] \leq E(X^2)/a^2 . \tag{1}$$

Proof. If $F(x)$ denotes the distribution function of the random variable X , then

$$\Pr[|X| \geq a] = \int_{|x| \geq a} dF(x).$$

Since in the region of integration $|x|/a \geq 1$, it follows that

$$\int_{|x| \geq a} dF(x) \leq \frac{1}{a^2} \int_{|x| \geq a} x^2 dF(x).$$

By extending the integration to all values of x , we merely strengthen the inequality:

$$\int_{|x| \geq a} dF(x) \leq \frac{1}{a^2} \int_{|x| \geq a} x^2 dF(x) \leq \frac{1}{a^2} \int x^2 dF(x) = E(X^2)/a^2. \quad \square$$

When a proof ends with a displayed equation as above, the box “ \square ” should be at the right end of the formula rather than at the beginning of the next line. In this case, the box must be inserted through `\qed` at the end of the equation, and a blank line must be left between the closing of the equation and the `\end{proof}` (as in the source of these instructions).

4.1 Spacing before and after environments

Extra space is added at the top of a list if the input file has a blank line before any list-making environment. The vertical space after the environment is the same as the one preceding it. The list-making environments are: `quote`, `quotation`, `verse`, `itemize`, `enumerate`, `description`, `center`, `flushleft`, and `flushright`, as well as all the theorem-like environments.

5. Figures and tables

Figures and tables are to be inserted in the text nearest their first reference. They should be arranged so as not to cause an excessive amount of blank space on the remainder of the page.

The captions are centred below the figures and above the tables. If a table needs to extend over to a second page, the continuation of the table should have a caption: “Table II (*cont.*)”. Macro `\continued` generates this caption. Example:

```
\begin{table}
\continued    % Instead of \caption
...
\end{table}
```

The figures could be produced using the `tikz` package, `xfig` vector-graphics editor, any other drawing tool, or cell-phone camera. The created pictures can be converted to, e.g. GIF, JPEG, PNG, or PDF format, and included using any of the graphics packages available in the \LaTeX bundle.

In a high-quality output, it may be desirable to use the same font in the text inside the figure as that used in the main body of the text. An example of this is given in Figure 1. The picture was drawn with `xfig`; all text was written using the special flag and the default \LaTeX fonts. The picture was exported to two files: a \LaTeX file contained the text and a PDF file contained the graphics. The \LaTeX part is inputted into this file; the \LaTeX part further includes the PDF part.

When including your own pictures, you can use, for example, the `graphicx` package, in which case

```
\usepackage{graphicx}
```

must be added to the preamble, after which a new figure can be inserted by using the command:

```
\includegraphics{filename}.
```

For possible options, e.g. how to scale the picture, consult your \LaTeX documentation.

Remember that **previously published material must be accompanied by written permission from the author and publisher!**

6. References

The preferred style of referring to the bibliography is to use numbered references: “Chazelle [1, Section 11.1] was excited about the following algorithms.” This is obtained by using the \LaTeX environment `thebibliography` or `BibTeX` with the `BibTeX` style file `DIKU.bst` which generates the bibliography items in the preferred format.

Another possibility is to use the author-date citation style: “Chazelle [2000, Section 11.1] was excited about the following algorithms.” Note that the years are in brackets in running text, but without brackets if the reference itself is in brackets. For three or more authors, use “et al.” Several papers in the same year are distinguished as “Raatikainen 1994a, Raatikainen 1994b”. When a source has more than two authors, the citation should be given in the form “[Cormen et al. 2009]”.

The \LaTeX style files provide the command `\alternativecitationstyle` to support the alternative citation style. The following macros are defined to simplify the use of the alternative style:

macro	produces
<code>\cite{bibreflabel}</code>	“[Author Year]”
<code>\cite[note]{bibreflabel}</code>	“[Author Year, note]”
<code>\citet{bibreflabel}</code>	“Author [Year]”
<code>\citet[note]{bibreflabel}</code>	“Author [Year, note]”
<code>\citealt{bibreflabel}</code>	“Author Year”
<code>\citealt[note]{bibreflabel}</code>	“Author Year, note”
<code>\citeauthor{bibreflabel}</code>	“Author”
<code>\citeyear{bibreflabel}</code>	“Year”

The macros above assume that your bibliography items are written as

```

\bibitem[Author]{Year}{bibreflabel}
\bibitem[Author]{Year1}{bibreflabel1}
\bibitem[Author]{Year2}{bibreflabel2}

```

The Bib_TE_X style file `DIKU-alternative.bst` generates the bibliography items in the format above.

7. Use of the files

We provide the following files:

1. `DIKU-article.cls` contains the L^AT_EX code for producing the camera-ready output of your write-up.
2. `DIKU-report.cls` is designed for longer documents like theses, books, and manuals. It provides some extensions to `DIKU-article.cls`, like the `titlepage` environment, commands `\frontmatter`, `\mainmatter`, `\backmatter`, `\tableofcontents`, `\part`, `\chapter`, and some undocumented features (for these, you have to look at the source code).
3. `DIKU.bst` contains the Bib_TE_X code which produces a list of references in the preferred form.
4. `DIKU-alternative.bst` contains the Bib_TE_X code which produces a list of references in the form suitable for the author-year citation style.
5. `shortstrings.bib` contains some string macros that can be used in other `bib` files.
6. `hyphenation.txt` contains a set of hyphenation rules that at some point were wrongly hyphenated by L^AT_EX. These rules are taken from the Oxford Advanced Learner's Dictionary [6].
7. `article-sample.tex` contains the L^AT_EX source of these instructions.
8. `article-sample.bib` contains the Bib_TE_X source to produce the list of references for the article sample.
9. `article-sample.dict` contains a list of words whose spelling has been accepted even though they were reported as misspellings by `ispell` when only the standard dictionary is in use.
10. `example.fig` contains the example figure in `xfig` format.
11. `thesis-sample.tex` contains a brief introduction (written in Danish) how to include the style file `ku-forside.sty` when writing a thesis with `DIKU-report.cls`.
12. `thesis-sample.bib` contains the Bib_TE_X source to produce the list of references for the thesis sample.
13. `thesis-sample.dict` contains a list of words in the thesis sample that are correctly spelled but reported as misspellings by `ispell`.
14. `makefile` is provided to make your life easier.
15. `article-sample.www` contains data used by our crawler. When this file exists, and this file and all other accompanying files are transferred to our web server, the generated document will be made visible via our web pages at <http://www.cphst1.dk>.

To process this document, on a Linux terminal, the following commands will produce a PDF file suitable for viewing on the screen or printing:

```
shell> pdflatex article-sample.tex
shell> bibtex article-sample
shell> pdflatex article-sample.tex
shell> pdflatex article-sample.tex
```

or

```
shell> make article-sample.pdf
```

8. Disclaimer

The style files are not guaranteed to be free of errors. Any bugs, deficiencies, and suggestions should be emailed to jyrki@di.ku.dk.

Acknowledgements

This section comes before the references and is unnumbered. L^AT_EX environment is **acknowledgements**.

The style files were created by modifying the style file `njcarticle.cls` provided by the *Nordic Journal of Computing* (NJC) and copyrighted by Kimmo Raatikainen. He gave us the permission to use this style file on 29 April 1996. His instructions for the NJC authors were used as the first draft of this document.

References

- [1] B. Chazelle, *The Discrepancy Method—Randomness and Complexity*, Cambridge University Press (2000). <https://www.cs.princeton.edu/~chazelle/pubs/book.pdf>
- [2] T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, *Introduction to Algorithms*, 3rd edition, The MIT Press (2009). <https://isbnsearch.org/isbn/978-0-262-53305-8> **NB!** a book.
- [3] The CPH STL, Website (2000–2018). <http://www.cphstl.dk/> **NB!** a website.
- [4] A. N. Gamby and J. Katajainen, Convex-hull algorithms: Implementation, testing, and experimentation (2018). <http://hjemmesider.diku.dk/~jyrki/Myris/GK2018J.html> **NB!** an unpublished manuscript.
- [5] N.-D. Hoang and N. K. Linh, Quicker than Quickhull, *Vietnam J. Math.* **43**, 1 (2015), 57–70. <https://doi.org/10.1007/s10013-014-0067-1> **NB!** a journal article.
- [6] A. S. Hornby, J. Turnbull, et al. (editors), *Oxford Advanced Learner's Dictionary*, 9th revised edition, Oxford University Press (2014). <https://isbnsearch.org/isbn/9780194798792>
- [7] J. Katajainen, Worst-case-efficient dynamic arrays in practice, *15th International Symposium on Experimental Algorithms, LNCS 9685*, Springer (2016), 167–183. <http://hjemmesider.diku.dk/~jyrki/Myris/Kat2016C.html> **NB!** a paper in a conference proceedings.
- [8] J. Katajainen and K. Raatikainen, Instructions to use DIKU style files, CPH STL Report **2001-1**, Department of Computer Science, University of Copenhagen (2001–2018). <http://www.cphstl.dk/Report/Example/article-sample.pdf> **NB!** a technical report.