The coppe document class

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Abstract

In this work, it is described the coppe document class as well as other files distributed by the CoppeTeX project. This class is suitable for writing academic dissertations, thesis and qualifying exams according to the formatting rules of the Alberto Luiz Coimbra Institute for Graduate Studies and Research in Engineering. The minimalist set of macro commands allows its users to concentrate most of their efforts on text composition rather than on the document layout.

1 Introduction

Writing documents in LATEX may be a laborious task when the authors have to prepare their manuscripts rigorously respecting formatting rules imposed by publishers. Regardless of difficulty, a lot of thesis presented to the Coordination of Graduate Studies and Research in Engineering of the Federal University of Rio de Janeiro (COPPE/UFRJ) is typeseted in LATEX. This demand motivated the creation of the COPPETEX project, which tries to facilitate and encourage the use of LATEX within the COPPE/UFRJ scope.

The coppe document class is the main product of COPPETEX. It was designed to be clear and succinct. It enables the creation of dissertations, qualifying exams and thesis in a simple and automatic way. The main goal of the coppe class is to maintain authors strictly focused on text composition without worrying about margins sizes, line spacing, paper size, vertical and horizontal alignment, etc. The COPPETEX project comprehends also BIBTEX and MakeIndex style files for creating lists of references, symbols and abbreviations. Although there aren't official guidelines to write qualifying exams, we provide this option just for convenience, as this exam is a requisite to obtain the DSc degree.

In which follows, it is described the user interface of the coppe class. Some details about using the style files cited above are also given. We use the term thesis to generally refer to dissertation, qualifying exam, and thesis itself.

2 License

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To see the full text of the GNU GPL license, go to the COPYING file attached to this package.

3 Support

We maintain a mailing list where users can send questions, comments, and bugs to. More details can be found here.

4 User interface

\frontmatter \mainmatter \backmatter A thesis to be approved by the Academic Registry at COPPE/UFRJ must contain three-parts: front, main and back matters [1]. Each one of these parts is started by calling its corresponding macro \frontmatter, \mainmatter or \backmatter. The front matter of a thesis consists of front cover and face, cataloging page, dedication, acknowledgments, abstracts, table of contents, and lists of tables, algorithms, symbols and abbreviations. The main matter is just composed by chapters, while the back matter usually consists of bibliographic references, appendices and index.

You must invoke the \frontmatter macro immediately after the \maketitle one. The \mainmatter command comes right before the first chapter, and \backmatter must be typed before the list of references.

Front cover

This element was recently introduced by the Academic Registry. It is automatically constructed by the \maketitle command.

Front face

The front face is unnumbered. There, it is not allowed to use hyphenation [1]. It is constructed by calling \maketitle. Next, it is described the commands used to enter the information required to create it.

\author

The \author command was redefined. Here, it takes two arguments: the author's first names and surname, e.g., \author{First Names}{Surname}. The words should be typed with only first letters in uppercase.

\title \foreigntitle The macros \title and \foreigntitle are used to enter the titles of your monograph in the current and foreign languages. The default languages are Brazilian Portuguese and English. The babel package is automatically loaded by coppe.cls, so you do not need to load it again. The Brazilian Portuguese is the main language and the English is only required for the foreign abstract.

\advisor \examiner Every COPPE student is coordinated by at least one advisor. M.Sc. and D.Sc. students can have at most 2 and 3 advisors, respectively. Their names must be provided by issuing the command \advisor as below:

```
\advisor{Title}{Advisor's Name}{Surname}{Degree}
\advisor{Title}{Second Advisor's Name}{Surname}{Degree}
\advisor{Title}{Third Advisor's Name}{Surname}{Degree}
```

The advisors are not necessarily members of the thesis examination board. Thus, it is required to enter the names of all examiners using the \examiner macro. The examiners' names are entered differently:

\examiner{Title}{First Examiner's Name Surname}{Degree}

```
\examiner{Title}{Second Examiner's Name Surname}{Degree}
...
\examiner{Title}{N-th Examiner's Name Surname}{Degree}
```

Remember that all names must be given before calling \maketitle.

\department

The Alberto Luiz Coimbra institute is divided into 12 academic units: Biomedical Engineering (PEB), Civil Engineering (PEC), Electrical Engineering (PEE), Mechanical Engineering (PEM), Metallurgical and Materials Science Engineering (PEMM), Nuclear Engineering (PEN), Ocean Engineering (PENO), Energy Planning (PPE), Production Engineering (PEP), Chemical Engineering (PEQ), Systems Engineering and Computer Science (PESC), and Transportation Engineering (PET). You must specify your department using one of the above abbreviations, e.g., \department{PEC}.

\date

This macro is used to set the month and year of defense. This information is required to create the front face, cataloging details page and abstracts. For example, October 2007 should be entered as \date{10}{2007}.

\keyword

The keywords should describe the concentration areas of your work. You must provide them as follows:

```
\keyword{First Keyword}
\keyword{Second Keyword}
...
\keyword{N-th Keyword}
```

Usually, six words are enough.

Cataloging details

This page contains cataloging information useful for librarians. Fortunately, it is automatically generated from the data you entered at the time you call \maketitle. It is not needed in qualifying exams, though.

Dedication (optional)

\dedication

This macro was added for convenience. The input text is placed at the right bottom of a blank page. It is emphasized and in normal size.

Abstracts

 ${\tt abstract} \\ {\tt foreignabstract} \\$

As stated by the Academic Registry [1], abstracts must be in one page each, with at most 250 words. We recommended that they should be only one paragraph long. They must be defined inside the environments abstract and foreignabstract.

Lists of symbols and abbreviations (optional)

\abbrev \symbl The lists of symbols and abbreviations are optional, although highly recommended. It is a good practice to define a symbol/abbreviation in its first occurrence in the text. To define a symbol use \symbol\{Symbol}{Symbol} Definition}, and for abbreviations \abbrev{Abbreviation}{Abbreviation} Definition}.

\makeloabbreviations \makelosymbols \printloabbreviations \printlosymbols commands are called *dummy*, since they don't output anything at the place they are executed, just an entry in the correspondent list.

These lists are lexicographically sorted by using the MakeIndex program, which is part of any LaTeX implementation. MakeIndex needs two commands to create a final sorted list: one which generates a list of entries and the other that indicates the position where the list will be printed out. To generate the lists of symbols and abbreviations, the coppe class provides the commands \makeloabbreviations and \makelosymbols, respectively. They must be called in the document preamble. The commands \printlosymbols and \printloabbreviations have to be invoked at the point where you want these lists appear, e.g., following the list of tables as showed in the example. Once you call latex, it will be created two files with extensions abx and syx, which contain MakeIndex input data. They must be processed with makeindex in order to get the lists correctly produced, redirecting the output to files with extension lab and los respectively:

```
makeindex -s coppe.ist -o example.lab example.abx
makeindex -s coppe.ist -o example.los example.syx
```

Note the -s option for specifying the style coppe.ist. Now, rerun latex twice to get the references solved and you are done.

References

It is well known that bibliography databases can be easily maintained with the aid of BibTeX. Thus, the CoppeTeX project designed two BibTeX styles, coppe-plain.bst and coppe-unsrt.bst. The coppe-plain.bst creates a list of references alphabetically sorted. The later is a numbered style, which sorts references by the order of citation. To use them, you have to select either coppe-plain or coppe-unsrt as the BibTeX style and include your BibTeX references without the bib extension, as in the following example:

```
\bibliographystyle{coppe-unsrt}
\bibliography{example}
```

Run in sequence IATEX, BIBTEX, and twice again IATEX to resolve reference. These styles are natbib compatible. This means that you can freely issue the commands \citet and \citep, as well as any other natbib feature.

5 Class options

There are some options users can specify in order to customize the appearance of the output produced by the coppe class. These options can be passed to coppe as follows: \documentclass[option1, option2]{coppe}. In which follows, we give a brief description of all supported options.

dsc, msc, dscexam The coppe class is able to produce thesis, dissertations, and qualifying exams, which are enabled by the dsc, msc, and dscexam options, respectively.

doublespacing The default line spacing is one-and-a-half. For enabling double spacing between lines, use the doublespacing option.

numbers The default citation style is the author-year scheme, which must be followed by the use of its corresponding BibTeX style, namely, the coppe-plain.bst file. For numbered citations, specify the option numbers to the coppe class. In this case, it is mandatory the use of coppe-unsrt.bst, as the bibliography style.

6 Quick, useful tips

Pictures. The default picture format of LATEX is the Encapsulated PostScript (EPS). If you use pdfLATEX, the default format becomes the PDF, but you can equally load PNG files. For such, you must enter the name of your image file without extension, e.g., \includegraphics{filename}, and pdflatex will firstly look for a file called filename.pdf and after for file filename.png. For producing high quality pictures with embedded fonts we recommend the Ipe drawing software available here.

Fonts. The default font in LATEX is the Computer Modern. If you would like to try its enhanced version, consider using the lmodern package. To use Times, it is recommended to load the package mathptmx, rather than the deprecated times. There is also an enhanced Times version available with the tgtermes package. You can still use the Arial font face with the package uarial.

Hyperref. When working with PDF's, there is the possibility to add extra information to the file as the author's name, document title, subject, keywords, etc. This is easily done with the hyperref package. It is also useful to enable hyperlinks. Fortunately, the coppe class will do this automatically if hyperref is loaded.

Printing. To get your work correctly printed, you must ensure that any page scaling option (e.g., fit or shrink to printable area) isn't enabled. This kind of option often comes in print dialogs of document visualization softwares.

7 A simple example

```
1 (*example)
2 \documentclass[dsc,numbers]{coppe}
3 \usepackage{amsmath,amssymb}
4 \usepackage{hyperref}
6 \makelosymbols
7 \makeloabbreviations
8
9 \begin{document}
    \title{T\'itulo da Tese}
10
    \foreigntitle{Thesis Title}
11
    \author{Nome do Autor}{Sobrenome}
12
    \advisor{Prof.}{Nome do Primeiro Orientador}{Sobrenome}{D.Sc.}
    \advisor{Prof.}{Nome do Segundo Orientador}{Sobrenome}{Ph.D.}
    \advisor{Prof.}{Nome do Terceiro Orientador}{Sobrenome}{D.Sc.}
```

```
16
    \examiner{Prof.}{Nome do Primeiro Examinador Sobrenome}{D.Sc.}
17
    \examiner{Prof.}{Nome do Segundo Examinador Sobrenome}{Ph.D.}
18
    \examiner{Prof.}{Nome do Terceiro Examinador Sobrenome}{D.Sc.}
19
    \examiner{Prof.}{Nome do Quarto Examinador Sobrenome}{Ph.D.}
20
    \examiner{Prof.}{Nome do Quinto Examinador Sobrenome}{Ph.D.}
    \department{PEC}
22
23
    \date{02}{2011}
24
    \keyword{Primeira palavra-chave}
25
    \keyword{Segunda palavra-chave}
26
    \keyword{Terceira palavra-chave}
27
28
    \maketitle
29
30
31
    \frontmatter
    \dedication{A algu\'em cujo valor \'e digno desta dedicat\'oria.}
32
33
    \chapter*{Agradecimentos}
34
35
    Gostaria de agradecer a todos.
36
37
    \begin{abstract}
38
39
40
    Apresenta-se, nesta tese, ...
41
    \end{abstract}
42
43
    \begin{foreignabstract}
44
45
    In this work, we present ...
46
47
    \end{foreignabstract}
48
49
    \tableofcontents
50
    \listoffigures
51
    \listoftables
52
53
    \printlosymbols
    \printloabbreviations
55
56
    \mainmatter
57
    \chapter{Introdu{\c c}\~ao}
58
    Segundo a norma de formata{\c c}\~ao de teses e disserta{\c c}\~oes do
59
    Instituto Alberto Luiz Coimbra de P\'os-gradua{\c c}\~ao e Pesquisa de
60
    Engenharia (COPPE), toda abreviatura deve ser definida antes de
61
    utilizada.\abbrev{COPPE}{Instituto Alberto Luiz Coimbra de P\'os-gradua{\c
62
    c}\~ao e Pesquisa de Engenharia}
63
64
65
    Do mesmo modo, \'e imprescind\'ivel definir os s\'imbolos, tal como o
    conjunto dos n\'umeros reais \mathbb{R} e o conjunto vazio \mathrm{methyset}.
66
67
    \symbl{$\mathbb{R}$}{Conjunto dos n\'umeros reais}
    \symbl{$\emptyset$}{Conjunto vazio}
68
69
```

```
\chapter{Revis\~ao Bibliogr\'afica}
70
71
    Para ilustrar a completa ades\~ao ao estilo de cita{\c c}\~oes e listagem de
72
    refer\^encias bibliogr\'aficas, a Tabela~\ref{tab:citation} apresenta cita{\c
73
    c}\~oes de alguns dos trabalhos contidos na norma fornecida pela CPGP da
74
    COPPE, utilizando o estilo num\'erico.
75
76
     \begin{table}[h]
77
     78
       \texttt{\textbackslash cite} do \LaTeX\ e
79
       o comando \texttt{\textbackslash citet},
80
       fornecido pelo pacote \texttt{natbib}.}
81
     \label{tab:citation}
82
     \centering
83
     {\footnotesize
84
     \begin{tabular}{|c|c|c|}
85
86
       Tipo da Publica{\c c}\~ao & \verb|\cite| & \verb|\citet|\\
87
88
       \hline
       Livro & \cite{book-example} & \citet{book-example}\\
89
       Artigo & \cite{article-example} & \citet{article-example}\\
90
       Relat\'orio & \cite{techreport-example} & \citet{techreport-example}\\
91
       Relat\'orio & \cite{techreport-exampleIn} & \citet{techreport-exampleIn}\\
92
       Anais de Congresso & \cite{inproceedings-example} &
93
         \citet{inproceedings-example}\\
94
       S\'eries & \cite{incollection-example} & \citet{incollection-example}\\
95
       Em Livro & \cite{inbook-example} & \citet{inbook-example}\\
       Disserta{\c c}\~ao de mestrado & \cite{mastersthesis-example} &
         \citet{mastersthesis-example}\\
98
       Tese de doutorado & \cite{phdthesis-example} & \citet{phdthesis-example}\\
99
100
       \hline
     \end{tabular}}
101
     \end{table}
102
103
     \chapter{M\'etodo Proposto}
104
105
     \chapter{Resultados e Discuss\~oes}
106
     \chapter{Conclus\~oes}
107
108
     \backmatter
109
     \bibliographystyle{coppe-unsrt}
110
     \bibliography{example}
111
     \appendix
112
     \chapter{Algumas Demonstra{\c c}\~oes}
114 \end{document}
115 (/example)
```

8 Implementation

8.1 The 'coppe.cls' file

```
116 (*class)
117 \def\filename{coppe.dtx}
118 \def\fileversion{v2.2}
```

```
119 \def\filedate{2011/02/08}
120 \NeedsTeXFormat{LaTeX2e}[1995/12/01]
121 \ProvidesClass{coppe}[\filedate\ \fileversion\ COPPE Dissertations and Thesis]
122 \LoadClass[12pt,a4paper,oneside]{book}
123 \RequirePackage[sort&compress] {natbib}
124 \RequirePackage{hyphenat}
125 \RequirePackage{lastpage}
126 \RequirePackage[english,brazil]{babel}
127 \RequirePackage{ifthen}
128 \RequirePackage{graphicx}
129 \RequirePackage{setspace}
130 \RequirePackage{tabularx}
131 \RequirePackage{eqparbox}
132 \RequirePackage{ltxcmds}
133 \RequirePackage[a4paper,bindingoffset=0.0cm,vcentering=true,%
134 top=2.5cm,bottom=2.5cm,left=3.0cm,right=3.0cm]{geometry}
135 \def\CoppeTeX{{\rm C\kern-.05em{\sc o\kern-.025em p\kern-.025em
136 p\kern-.025em e}}\kern-.08em
137 T\kern-.1667em\lower.5ex\hbox{E}\kern-.125emX\spacefactor1000}
138 \newboolean{maledoc}
139 \setboolean{maledoc}{false}
140 %
141 % Definiton of class options.
142 \DeclareOption{msc}{%
     \newcommand{\@degree}{M.Sc.}
144
     \newcommand{\@degreename}{Mestrado}
     \newcommand{\local@degname}{Mestre}
145
146
     \newcommand{\foreign@degname}{Master}
147
     \newcommand\local@doctype{Disserta{\c c}{\~ a}o}
     \newcommand\foreign@doctype{Dissertation}
148
149 }
150 \DeclareOption{dscexam}{%
     \newcommand{\@degree}{D.Sc.}
151
     \newcommand{\@degreename}{Doutorado}
152
     \newcommand{\local@degname}{Doutor}
153
     \newcommand{\foreign@degname}{Doctor}
154
     \setboolean{maledoc}{true}
155
     \label{local@doctype} $$\operatorname{Exame de Qualifica(\c c){\^ a}o}$$
156
     \newcommand\foreign@doctype{Qualifying Exam}
157
158 }
159 \DeclareOption{dsc}{%
     \newcommand{\@degree}{D.Sc.}
160
     \newcommand{\@degreename}{Doutorado}
161
     \newcommand{\local@degname}{Doutor}
162
163
     \newcommand{\foreign@degname}{Doctor}
     \newcommand\local@doctype{Tese}
164
     \newcommand\foreign@doctype{Thesis}
165
166 }
167 \DeclareOption{numbers}{%
     \PassOptionsToPackage{numbers}{natbib}
168
169 }
```

Here is the default one-and-a-half line spacing. Users can change to double spacing by passing the doublespacing option.

```
170 \onehalfspacing
            171 \DeclareOption{doublespacing}{%
                  \doublespacing
            173 }
            174 \ProcessOptions\relax
             This macro is used to set the author's affiliation. There are twelve options which
\department
             correspond to all academic units at COPPE/UFRJ. It defines the current and the
             foreign names of these units.
            175 \newcommand\department[1]{%
                  \ifthenelse{\equal{#1}{PEB}}
            177
                    {\global\def\local@deptname{Engenharia Biom{\', e}dica}
                     \global\def\foreign@deptname{Biomedical Engineering}}{}
            178
            179
                  \ifthenelse{\equal{#1}{PEC}}
            180
                    {\global\def\local@deptname{Engenharia Civil}
            181
                     \global\def\foreign@deptname{Civil Engineering}}{}
                  \left\{ \left( \frac{\#1}{PEE} \right) \right\}
            182
                    {\global\def\local@deptname{Engenharia El{\', e}trica}
            183
                     \global\def\foreign@deptname{Electrical Engineering}}{}
            184
            185
                  \ifthenelse{\equal{#1}{PEM}}
            186
                    {\global\def\local@deptname{Engenharia Mec{\^ a}nica}
            187
                     \global\def\foreign@deptname{Mechanical Engineering}}{}
                  \ifthenelse{\equal{#1}{PEMM}}
            188
                    {\global\def\local@deptname{Engenharia Metal{\' u}rgica e de Materiais}
            189
            190 \global\def\foreign@deptname{Metallurgical and Materials Engineering}}{}
                  \ifthenelse{\equal{#1}{PEN}}
            191
                    {\global\def\local@deptname{Engenharia Nuclear}
            192
                     \global\def\foreign@deptname{Nuclear Engineering}}{}
            193
            194
                  \ifthenelse{\equal{#1}{PENO}}
            195
                    {\global\def\local@deptname{Engenharia Oce{\^ a}nica}
            196
                     \global\def\foreign@deptname{Ocean Engineering}}{}
                  \left\{ \begin{array}{l} {\bf 1}_{PPE} \end{array} \right\}
            197
                    {\global\def\local@deptname{Planejamento Energ{\' e}tico}
            198
            199
                     \global\def\foreign@deptname{Energy Planning}}{}
                  \left\{ \frac{\#1}{PEP} \right\}
            200
                    {\c c}{\c a}o \end{\c c}{\c a}o \end{\c c}{\c a}o \end{\c c}
            201
                     \global\def\foreign@deptname{Production Engineering}}{}
            202
                  \ifthenelse{\equal{#1}{PEQ}}
            203
                    {\global\def\local@deptname{Engenharia Qu{\', i}mica}
            204
            205
                     \global\def\foreign@deptname{Chemical Engineering}}{}
            206
                  \ifthenelse{\equal{#1}{PESC}}
                    \label{local@deptname} $$\{\c c}^{\c a}o\}$
            207
                     \global\def\foreign@deptname{Systems Engineering and Computer Science}}{}
            208
                  \ifthenelse{\equal{#1}{PET}}
            209
                    {\global\def\local@deptname{Engenharia de Transportes}
            210
                     \global\def\foreign@deptname{Transportation Engineering}}{}
            211
            212 }
     \title Used to enter the title in Brazilian Portuguese.
            213 \renewcommand\title[1]{%
                  \global\def\local@title{#1}%
            215 }
```

\foreigntitle Used to enter the foreign title.

```
217 \global\def\foreign@title{#1}%
                   218 }
          \advisor Defines globally the title, name and academic degree of the advisors.
                   219 \newcount\@advisor\@advisor0
                   220 \newcommand\advisor[4]{%
                        \verb|\global@namedef{CoppeAdvisorTitle:\expandafter\the@advisor}{\#1}|
                         \verb|\global@namedef{CoppeAdvisorName:\expandafter\the@advisor}{\#2}|
                         \global\@namedef{CoppeAdvisorSurname:\expandafter\the\@advisor}{#3}
                         \global\@namedef{CoppeAdvisorDegree:\expandafter\the\@advisor}{#4}
                         \global\advance\@advisor by 1
                        \ifnum\@advisor>1
                   227
                           \renewcommand\local@advisorstring{Orientadores}
                           \renewcommand\foreign@advisorstring{Advisors}
                   228
                   229
                        \fi
                   230 }
         \examiner
                    231 \newcount\@examiner\@examiner0
                   232 \newcommand\examiner[3] {%
                   233 \global\@namedef{CoppeExaminer:\expandafter\the\@examiner}{#1\ #2, #3}
                         \global\advance\@examiner\ by\ 1
                   234
                   235 }
           \author It was redefined to allow the identification of the author's first names and surname.
                    236 \renewcommand\author[2]{%
                        \global\def\@authname{#1}
                   238
                         \global\def\@authsurn{#2}
                   239 }
             \date This code makes easy to switch from dates in different languages.
                    240 \renewcommand\date[2]{%
                   241
                        \month=#1
                   242
                        \year=#2
                   243 }
 \local@monthname
                   244 \newcommand \local@monthname {\ifcase \month\or
                         Janeiro\or Fevereiro\or Mar{\c c}o\or Abril\or Maio\or Junho\or
                   246
                         Julho\or Agosto\or Setembro\or Outubro\or Novembro\or Dezembro\fi}
\foreign@monthname
                   247 \newcommand\foreign@monthname{\ifcase\month\or
                         January\or February\or March\or April\or May\or June\or
                         July\or August\or September\or October\or November\or December\fi}
          \keyword
                   250 \newcounter{keywords}
                   251 \newcommand\keyword[1]{%
                   252 \global\@namedef{CoppeKeyword:\expandafter\the\c@keywords}{#1}
                        \global\addtocounter{keywords}{1}
                   254 }
```

216 \newcommand\foreigntitle[1]{%

```
The number of pages for both frontmatter and mainmatter printed in the cata-
\frontmatter
              loging details page is computed by means of simple LATEX labels.
              255 \renewcommand\frontmatter{%
              256 \cleardoublepage
                   \@mainmatterfalse
              257
             258
                   \pagenumbering{roman}
              259
                   \thispagestyle{empty}
              260
                   \setcounter{page}{2}
              261
                   \makefrontpage
              262
                   \clearpage
              263
                   \pagestyle{plain}
                   \label{local} $$ \left( \mathbb{S}_{\mathbb{S}^{\mathbb{S}}} \right) $$ if the nelse $$ \left( \mathbb{S}_{\mathbb{S}^{\mathbb{S}}} \right) $$
              264
             265 }
 \mainmatter
              266 \renewcommand\mainmatter{%
                   \coppe@mainBegin
              268
                   \cleardoublepage
              269
                   \@mainmattertrue
             270
                   \pagestyle{plain}
                   \pagenumbering{arabic}}
             271
 \backmatter
              272 \renewcommand\backmatter{%
                   \if@openright
              274
                     \cleardoublepage
              275
                  \else
             276
                     \clearpage
                  \fi}
             277
             278 %
  \maketitle
             279 \renewcommand\maketitle{%
             280 \pagenumbering{alph}
                  \ltx@ifpackageloaded{hyperref}{\coppe@hypersetup}{}%
              282 \begin{titlepage}
              283 \begin{flushleft}
             284 \quad \text{vspace}*\{1.5\text{mm}\}
                   \setlength\baselineskip{0pt}
              285
                   \setlength\parskip{1mm}
              286
                   287
              288
                   \end{flushleft}
                   \vspace{1.05cm}
              289
                   \begin{center}
                   \nohyphens{\MakeUppercase\local@title}\par
              292
                   \vspace*{3cm}
                   \nohyphens{\Qauthname\ \Qauthsurn}\par
              293
                   \end{center}
              294
                   \vspace*{2.1cm}
             295
                   \begin{flushright}
             296
                   \begin{minipage}{8.45cm}
             297
                  \frontcover@maintext
             298
                  \end{minipage}\par
```

```
\vspace*{7.5mm}
300
     \nohyphens{%
301
     \begin{tabularx}{8.45cm}[b]{0{}l0{}} \raggedright\arraybackslash}X0{}}
302
       \local@advisorstring: &
303
304
       \count1=0
       \t 0 = {}
305
       \@whilenum \count1<\@advisor \do{%
306
307
       \ifcase\count1 % same as \ifnum0=\count1
         \toks@=\expandafter{\csname CoppeAdvisorName:\the\count1%
308
           \expandafter\endcsname\expandafter\space%
309
           \csname CoppeAdvisorSurname:\the\count1\endcsname\\}
310
       \else
311
         \toks@=\expandafter\expandafter\%
312
313
           \expandafter\the\expandafter\toks0%
           \expandafter&\expandafter\space%
314
           \csname CoppeAdvisorName:\the\count1\expandafter\endcsname%
315
            \expandafter\space\csname CoppeAdvisorSurname:\the\count1\endcsname\\
316
317
         }%
       \fi
318
       \advance\count1 by 1}
319
       \the\toks@
320
     \end{tabularx}}\par
321
     \end{flushright}
322
     \vspace*{\fill}
323
324
     \begin{center}
     \local@cityname\par
     \local@monthname\ de \number\year
327
     \end{center}
328
     \end{titlepage}
     \global\let\maketitle\relax%
329
     \global\let\and\relax}
330
331 \newcommand\makefrontpage{%
332
     \begin{center}
       \sloppy\nohyphens{\MakeUppercase\local@title}\par
333
       334
       {\@authname\ \@authsurn}\par
335
     \end{center}\par
336
337
     \vspace*{4mm}
338
     \frontpage@maintext
339
     \vspace*{8mm}
     \noindent\local@approvedname:\par
        \begin{center}
341
     \begin{flushright}
342
           \count 1=0
343
           \@whilenum \count1<\@examiner \do {
344
               \vskip26\p@ \baselineskip12pt
345
           \eqmakebox[signture@list][c]{\hrulefill}\\
346
347
           \eqmakebox[signture@list][c]{%
348
               \ \ \ \protect\csname CoppeExaminer:\the\count1 \endcsname\ \ \ }\\
349
               \advance\count1 by 1}
350
     \end{flushright}
351
        \end{center}
352
     \vspace*{\fill}
```

```
\frontpage@bottomtext}
354 \newcommand\coppe@hypersetup{%
355 \begingroup
    % changes to \toks@ and \count@ are kept local;
     % it's not necessary for them, but it is usually the case
    % for \count1, because the first ten counters are written
     % to the DVI file, thus you got lucky because of PDF output
     \toks@={}% in this special case not necessary
360
     \count@=0 %
361
     \@whilenum\count@<\value{keywords}\do{%
362
       % * a keyword separator is not necessary,
363
364
            if there is just one keyword
365
       % * \csname CoppeKeyword:\the\count@\endcsname must be expanded
366
            at least once, to get rid of the loop depended \count@
367
       \ifcase\count@ % same as \ifnum0=\count@
368
         \toks@=\expandafter{\csname CoppeKeyword:\the\count@\endcsname}%
369
       \else
         \toks@=\expandafter\expandafter\%
370
           \expandafter\the\expandafter\toks@
371
           \expandafter;\expandafter\space
372
           \csname CoppeKeyword:\the\count@\endcsname
373
         }%
374
375
       \fi
       \advance\count@ by 1 %
376
377
     \edef\x{\endgroup
378
       \noexpand\hypersetup{%
379
380
         pdfkeywords={\the\toks@}%
       }%
381
     }%
382
383 \x
384 \hypersetup{%
     pdfauthor={\@authname\ \@authsurn},
385
     pdftitle={\local@title},
386
     pdfsubject={\local@doctype\ de \@degreename\ em \local@deptname\ da COPPE/UFRJ},
387
     pdfcreator={LaTeX with CoppeTeX toolkit},
389
     breaklinks={true},
390
     raiselinks={true},
     pageanchor={true},
391
392 }}
```

\makecatalog When the document has illustrations, it is required to insert ": il.;" between the number of pages of the textual part and the page dimension. We have created a label to flag the existence of lists of figures. It is checked to be undefined using the plain TeX command \@isundefined [7].

```
393 \newcommand\makecatalog{%
394 \vspace*{\fill}
395 \begin{center}
396 \setlength{\fboxsep}{5mm}
397 \framebox[120mm][c]{\makebox[5mm][c]{}%
398 \begin{minipage}[c]{105mm}
399 \setlength{\parindent}{5mm}
400 \noindent\sloppy\nohyphens\@authsurn,
```

```
\nohyphens\@authname\par
                      \nohyphens{\local@title/\@authname\ \@authsurn. -- \local@cityname:
            402
                      UFRJ/COPPE, \number\year.}\par
            403
                      \pageref{front:pageno},
            404
            405
                      \pageref{LastPage}
                      p.\@ifundefined{r@cat:lofflag}{}\pageref{cat:lofflag}} $29,7$cm.\par
            406
                      % There is an issue here. When the last entry must be split between lines,
            407
                      \% the spacing between it and the next paragraph becomes smaller.
            408
            409
                      % Should we manually introduce a fixed space? But how could we know that
                      % a name was split? Is this happening yet?
            410
            411
                      \nohyphens{%
                      \label{local-condition} $$ \operatorname{tabularx}_{100mm}[b]_{0{}l0{}} {\raggedright\arraybackslash}_{0{}} $$
            412
                        \local@advisorstring: &
            413
                        \count1=0
            414
                        \t 0={}
            415
                        \@whilenum \count1<\@advisor \do{%
            416
                        \ifcase\count1 % same as \ifnum0=\count1
            417
                          \toks@=\expandafter{\csname CoppeAdvisorName:\the\count1%
            419
                          \expandafter\endcsname\expandafter\space%
            420
                          \csname CoppeAdvisorSurname:\the\count1\endcsname\\}
            421
                        \else
                          \toks@=\expandafter\expandafter\expandafter{%
            422
                            \expandafter\the\expandafter\toks@
            423
                            \expandafter&\expandafter\space
            424
            425
                            \csname CoppeAdvisorName:\the\count1\expandafter\endcsname%
            426
                            \expandafter\space\csname CoppeAdvisorSurname:\the\count1\endcsname\\
                          }%
            427
                        \fi
            428
                        \advance\count1 by 1}
            429
            430
                        \the\toks@
                      \end{tabularx}}\par
            431
                      \nohyphens{\local@doctype\ ({\MakeLowercase\@degreename}) --
            432
                      UFRJ/COPPE/Programa de \local@deptname, \number\year.}\par
            433
                      \bibname: p. \pageref{bib:begin} -- \pageref{bib:end}.\par
            434
                      \count1=0
            435
                      \count2=1
            436
            437
                      \nohyphens{\@whilenum \count1<\value{keywords} \do {%
            438
                        \number\count2. \csname CoppeKeyword:\the\count1 \endcsname.
            439
                        \advance\count1 by 1
            440
                        \advance\count2 by 1}
                      I. \csname CoppeAdvisorSurname: 0\endcsname, %
            441
            442
                      \ \csname CoppeAdvisorName:0\endcsname%
                      443
                      II. \local@universityname, COPPE, Programa de \local@deptname.
            444
                      III. T{\' i}tulo.}
            445
                    \end{minipage}}
            446
            447
                  \end{center}
                  \vspace*{\fill}}
            448
\dedication
            449 \newcommand\dedication[1]{
                  \gdef\@dedic{#1}
            450
                    \cleardoublepage
            451
            452
                    \vspace*{\fill}
```

401

```
\begin{flushright}
                 453
                          \begin{minipage}{60mm}
                 454
                            \raggedleft \it \normalsize \@dedic
                 455
                 456
                          \end{minipage}
                        \end{flushright}}
                 457
                This is a specialization of the abstract in the article standard class.
       abstract
                 458 \newenvironment{abstract}{%
                      \clearpage
                      \thispagestyle{plain}
                 461
                      \abstract@toptext\par
                 462
                      \vspace*{8.6mm}
                 463
                      \begin{center}
                 464
                        \sloppy\nohyphens{\MakeUppercase\local@title}\par
                 465
                        \vspace*{13.2mm}
                        \@authname\ \@authsurn \par
                 466
                 467
                        \vspace*{7mm}
                 468
                        \local@monthname/\number\year
                 469
                      \end{center}\par
                      \vspace*{\fill}
                 470
                      \noindent%
                      \begin{tabularx}{\textwidth}[b]{0{}10{ }>{\raggedright\arraybackslash}X0{}}
                 472
                 473
                        \local@advisorstring: &
                 474
                        \count1=0
                 475
                        \t 0 = {}
                        \@whilenum \count1<\@advisor \do{%
                 476
                 477
                        \ifcase\count1 % same as \ifnum0=\count1
                 478
                          \toks@=\expandafter{\csname CoppeAdvisorName:\the\count1%
                 479
                          \expandafter\endcsname\expandafter\space%
                          \csname CoppeAdvisorSurname:\the\count1\endcsname\\}
                 480
                 481
                 482
                          \toks@=\expandafter\expandafter\expandafter{%
                 483
                            \expandafter\the\expandafter\toks@
                 484
                            \expandafter&\expandafter\space
                            \csname CoppeAdvisorName:\the\count1\expandafter\endcsname%
                 485
                            \expandafter\space\csname CoppeAdvisorSurname:\the\count1\endcsname\\
                 486
                          }%
                 487
                        \fi
                 488
                 489
                        \advance\count1 by 1}
                 490
                        \the\toks@
                 491
                      \end{tabularx}\par
                      \vspace*{2mm}
                      \noindent\local@deptstring: \local@deptname\par
                 493
                 494
                      \vspace*{7mm}}{\vspace*{\fill}}
foreignabstract
                 495 \newenvironment{foreignabstract}{%
                 496
                     \clearpage
                 497
                      \thispagestyle{plain}
                      \begin{otherlanguage}{english}
                 498
                      \foreignabstract@toptext\par
                 499
                      \vspace*{8.6mm}
                 500
                 501
                      \begin{center}
                        \sloppy\nohyphens{\MakeUppercase\foreign@title}\par
```

502

```
\@authname\ \@authsurn \par
               504
                       \vspace*{7mm}
               505
                       \foreign@monthname/\number\year
               506
               507
                     \end{center}\par
                     \vspace*{\fill}
               508
                     \noindent%
               509
                     \begin{tabularx}{\textwidth}[b]{0{}10{ }>{\raggedright\arraybackslash}X0{}}
               510
               511
                       \foreign@advisorstring: &
                       \count1=0
               512
                       \t 0={}
               513
                       \@whilenum \count1<\@advisor \do{%
               514
                       \ifcase\count1 % same as \ifnum0=\count1
               515
                         \toks@=\expandafter{\csname CoppeAdvisorName:\the\count1%
               516
                         \expandafter\endcsname\expandafter\space%
               517
                         \csname CoppeAdvisorSurname:\the\count1\endcsname\\}
               518
               519
               520
                         \toks@=\expandafter\expandafter\%
               521
                           \expandafter\the\expandafter\toks@
               522
                           \expandafter&\expandafter\space
                           \csname CoppeAdvisorName:\the\count1\expandafter\endcsname%
               523
                           \expandafter\space\csname CoppeAdvisorSurname:\the\count1\endcsname\\
               524
                         }%
               525
                       \fi
               526
               527
                       \advance\count1 by 1}
                       \the\toks@
               528
                     \end{tabularx}\par
               529
                     \vspace*{2mm}
               531
                     \noindent\foreign@deptstring: \foreign@deptname\par
               532
                     \vspace*{7mm}}{%
                     \end{otherlanguage}
               533
                     \vspace*{\fill}
               534
                     \global\let\@author\@empty
               535
                     \global\let\@date\@empty
               536
                     \global\let\foreign@title\@empty
               537
               538
                     \global\let\foreign@title\relax
               539
                     \global\let\local@title\@empty
                     \global\let\local@title\relax
                     \global\let\author\relax
               542
                     \global\let\author\relax
               543
                     \global\let\date\relax}
\listoffigures
               544 \renewcommand\listoffigures{%
                       \coppe@hasLof
               545
               546
                       \if@twocolumn
               547
                         \@restonecoltrue\onecolumn
               548
                       \else
               549
                         \@restonecolfalse
                       \fi
               550
                       \chapter*{\listfigurename}%
               551
                         \addcontentsline{toc}{chapter}{\listfigurename}%
               552
               553
                         \@mkboth{\MakeUppercase\listfigurename}%
               554
                                 {\MakeUppercase\listfigurename}%
```

\vspace*{13.2mm}

503

```
\@starttoc{lof}%
                         555
                                 \if@restonecol\twocolumn\fi
                         556
                         557
         \listoftables
                        558 \renewcommand\listoftables{%
                                 \if@twocolumn
                         559
                         560
                                   \@restonecoltrue\onecolumn
                         561
                                 \else
                                   \@restonecolfalse
                         562
                         563
                                 \fi
                                 \chapter*{\listtablename}%
                         564
                                   \addcontentsline{toc}{chapter}{\listtablename}%
                         565
                         566
                                   \@mkboth{%
                         567
                                       \MakeUppercase\listtablename}%
                         568
                                      {\MakeUppercase\listtablename}%
                         569
                                 \@starttoc{lot}%
                         570
                                 \if@restonecol\twocolumn\fi
                         571
      \printlosymbols
                         572 \mbox{ \newcommand\printlosymbols} \
                         573 \ensuremath{\mbox{\sc saryname}{\label{listsymbolname}}}\%
                         574 \ensuremath{\mbox{0input0}{\mbox{1jobname.los}}}
        \makelosymbols
                         575 \def\makelosymbols{%
                         576
                              \newwrite\@losfile
                        577
                              \immediate\openout\@losfile=\jobname.syx
                              \def\symbl{\@bsphack\begingroup
                        578
                                           \@sanitize
                         579
                         580
                                           \@wrlos}\typeout
                              {Writing index of symbols file \jobname.syx}%
                         581
                         582
                              \let\makelosymbols\@empty
                         583 }
                         584 \@onlypreamble\makelosymbols
                         585 \AtBeginDocument{%
                         586 \ensuremath{\verb|\|} \texttt{0ifpackageloaded\{hyperref\}\{\%\}}
                              \def\@wrlos#1#2{%}
                         587
                         588
                                 \protected@write\@losfile{}%
                                   589
                         590
                                 \endgroup
                                 \@esphack}}{%
                         591
                         592
                              \def\@wrlos#1#2{%
                                 \protected@write\@losfile{}%
                         593
                                   {\left[\#1\right] \ \#2}{\left[\#1\right] \ \#2}}
                         594
                                 \endgroup
                         595
                                 \@esphack}}}
                         596
\printloabbreviations
                         597 \mbox{ \newcommand\printloabbreviations} \mbox{\normal} \mbox{\normal}
                         598 \renewcommand\glossaryname{\listabbreviationname}%
                         599 \@input@{\jobname.lab}}
```

\makeloabbreviations

```
600 \def\makeloabbreviations{%
     \newwrite\@labfile
601
602
     \immediate\openout\@labfile=\jobname.abx
603
     \def\abbrev{\@bsphack\begingroup
604
                  \@sanitize
605
                  \@wrlab}\typeout
606
     {Writing index of abbreviations file \jobname.abx}%
607
     \let\makeloabbreviations\@empty
608 }
609 \verb|\color| only
preamble \verb|\makeloabbreviations|
610 \AtBeginDocument{%
611 \@ifpackageloaded{hyperref}{%
     \def\@wrlab#1#2{%
612
613
       \protected@write\@labfile{}%
          {\string\indexentry{[#1] #2|hyperpage}{\thepage}}%
614
615
       \endgroup
616
       \@esphack}}{%
617
     \def\@wrlab#1#2{%}
       \protected@write\@labfile{}%
618
          {\string\indexentry{[#1] #2}{\arabic{page}}}%
619
620
       \endgroup
       \@esphack}}}
621
622 % Some macros used to generate cataloging information.
623 \AtBeginDocument{%
624
     \ltx@ifpackageloaded{hyperref}{
625
       \def\coppe@bibEnd{%
626
          \immediate\write\@auxout{%
            \label{bib:end} $$ \left( page \right) { page. \arabic \{page\} \} } 
627
       \def\coppe@bibBegin{%
628
          \immediate\write\@auxout{%
629
630
            \string\newlabel{bib:begin}{{}\arabic{page}}{}{page.\arabic{page}}{}}}}%
631
       \def\coppe@mainBegin{%
632
          \immediate\write\@auxout{%
            \string\newlabel{front:pageno}{{}{\Roman{page}}{}{page.\roman{page}}{}}}}}%
633
634
       \def\coppe@hasLof{%
635
          \immediate\write\@auxout{%
            \string\newlabel{cat:lofflag}{{}{:~il.;}{}{page.\roman{page}}{}}}}%
636
     }{%
637
638
       \def\coppe@bibEnd{%
          \immediate\write\@auxout{%
639
          \string\newlabel{bib:end}{{}\arabic{page}}{}}}%
640
641
       \def\coppe@bibBegin{%
          \immediate\write\@auxout{%
642
          \string\newlabel{bib:begin}{{}\arabic{page}}{}}}}%
643
644
       \def\coppe@mainBegin{%
645
          \immediate\write\@auxout{%
            \string\newlabel{front:pageno}{{}{\Roman{page}}{}}}}%
646
       \def\coppe@hasLof{%
647
         \verb|\immediate| write @auxout{%|}
648
            \string\newlabel{cat:lofflag}{{}{:~il.;}{}}}}%
649
650
    }%
651 }
```

```
652 \newdimen\bibindent%
653 \setlength\bibindent{1.5em}%
654 \renewenvironment{thebibliography}[1]%
        {\onehalfspacing%
655
         \chapter*{\bibname}%
656
         \addcontentsline{toc}{chapter}{\bibname}%
657
         \coppe@bibBegin
658
659
         \list{\@biblabel{\@arabic\c@enumiv}}%
660
              {\setlength{\labelwidth}{0ex}%
               \setlength{\leftmargin}{9.0ex}%
661
               662
               \advance\leftmargin\labelsep%
663
               \@openbib@code%
664
               \usecounter{enumiv}%
665
               \let\p@enumiv\@empty%
666
               \renewcommand\theenumiv{\@arabic\c@enumiv}}%
667
         \sloppy%
668
         \clubpenalty4000%
669
         \@clubpenalty \clubpenalty%
670
         \widowpenalty4000%
671
         \sfcode'\.\@m}%
672
        {\def\@noitemerr%
673
674
          {\@latex@warning{Empty 'thebibliography' environment}}%
675
          \coppe@bibEnd
676
         \endlist}
677 \newenvironment{theglossary}{%
    \if@twocolumn%
679
       \@restonecoltrue\onecolumn%
680
     \else%
       \@restonecolfalse%
681
     \fi%
682
     \@mkboth{\MakeUppercase\glossaryname}%
683
     {\MakeUppercase\glossaryname}%
684
     \chapter*{\glossaryname}%
685
     \addcontentsline{toc}{chapter}{\glossaryname}
686
     \list{}
687
     {\setlength{\listparindent}{0in}%
688
      \setlength{\labelwidth}{1.0in}%
689
      \setlength{\leftmargin}{1.5in}%
690
      \setlength{\labelsep}{0.5in}%
691
692
      \setlength{\itemindent}{Oin}}%
      \sloppy}%
693
     {\if@restonecol\twocolumn\fi%
694
695 \endlist}
697 \renewenvironment{theindex}{%
    \if@twocolumn
698
699
       \@restonecolfalse
    \else
700
      \@restonecoltrue
701
702
     703
704
     \@mkboth{\MakeUppercase\indexname}%
     {\MakeUppercase\indexname}%
```

```
\thispagestyle{plain}\parindent\z@
706
     \addcontentsline{toc}{chapter}{\indexname}
707
    \parskip\z@ \@plus .3\p@\relax
708
    \columnseprule \z0
709
710 \columnsep 35\p@
711 \let\item\@idxitem}
712 {\if@restonecol\onecolumn\else\clearpage\fi}
713 \newcommand\glossaryname{Glossary}
714 \newcommand\listabbreviationname{Lista de Abreviaturas}
715 \newcommand\listsymbolname{Lista de S{\' i}mbolos}
716 %
717 \newcommand\local@advisorstring{Orientador}
718 \newcommand\foreign@advisorstring{Advisor}
719 \ifthenelse{\boolean{maledoc}}{%
    \newcommand\local@approvedname{Examinado por}%
721 }{%
     \newcommand\local@approvedname{Examinada por}%
722
723 }
724 \newcommand\local@universityname{Universidade Federal do Rio de Janeiro}
725 \newcommand\local@deptstring{Programa}
726 \newcommand\foreign@deptstring{Department}
727 \newcommand\local@cityname{Rio de Janeiro}
728 \newcommand\local@statename{RJ}
729 \newcommand\local@countryname{Brasil}
731 \newcommand\frontcover@maintext{
    \sloppy\nohyphens{\local@doctype\ de \@degreename\
    \ifthenelse{\boolean{maledoc}}{apresentado}{apresentada}
    ao Programa de P{\' o}s-gradua{\c c}{\~ a}o em \local@deptname,
    COPPE, da \local@universityname, como parte dos requisitos
736
    necess{\' a}rios {\' a} obten{\c c}{\^ a}o do t{\' i}tulo de
     \local@degname\ em \local@deptname.}
737
738 }
739 %
740 \newcommand\frontpage@maintext{
     \noindent {\MakeUppercase\local@doctype}
741
     \ifthenelse{\boolean{maledoc}}{SUBMETIDO}{SUBMETIDA}
     \sloppy\nohyphens{AO CORPO DOCENTE DO INSTITUTO ALBERTO LUIZ COIMBRA
     DE P{\' 0}S-GRADUA{\c C}{\^ A}O E PESQUISA DE ENGENHARIA (COPPE) DA
     UNIVERSIDADE FEDERAL DO RIO DE JANEIRO COMO PARTE DOS REQUISITOS
     NECESS{\', A}RIOS PARA A OBTEN{\c C}{\~ A}O DO GRAU DE
746
747
     {\MakeUppercase\local@degname} EM CI{\^E}NCIAS EM
748
     {\MakeUppercase\local@deptname.\par}}%
749 }
750 %
751 \newcommand\frontpage@bottomtext{%
     \begin{center}
     {\MakeUppercase{\local@cityname, \local@statename\ -- \local@countryname}}\par
     {\MakeUppercase\local@monthname\ DE \number\year}
754
755
     \end{center}%
756 }
757 %
758 \newcommand\abstract@toptext{%
     \noindent Resumo \ifthenelse{\boolean{maledoc}}{do}{da}
```

```
\label{localQdoctype} $$ \c {\bf Qdoctype} \ \end{\bf Qdoctype} \ \end{\bf Qdoctype} $$ \c {\bf Qdoctype} \ \end{\bf
760
                     \sloppy\nohyphens{{\'a} COPPE/UFRJ como parte dos requisitos
761
                    necess{\' a}rios para a obten{\c c}{\~ a}o do grau de
762
                     \local@degname\ em Ci{\^ e}ncias (\@degree)}
763
764 }
765 \newcommand\foreignabstract@toptext{%
                     \noindent \sloppy\nohyphens{Abstract of \foreign@doctype\ presented to
766
                     COPPE/UFRJ as a partial fulfillment of the requirements for the
                     degree of \foreign@degname\ of Science (\@degree)}
768
769 }
770 %
771 (/class)
772 (*glossary)
773 actual '='
774 quote '!'
775 level '>'
776 delim_0 ", p. "
777 lethead_flag 0
778 headings_flag 0
779 preamble
780 "\n\\begin{theglossary}\n \\makeatletter"
781 postamble
 782 "\n \\end{theglossary}\n"
 783 (/glossary)
```

Acknowledgments

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- [4] Oren Patashnik. Bibtexing. Documentation for general BibTEX users, February 1988.
- [5] Oren Patashnik. Designing bibtex styles. The part of BibTeX 's documentation that's not meant for general users, February 1988.
- [6] William Strunk, Jr. and E. B. White. *The Elements of Style*. Macmillan, 3 edition, 1979.
- [7] TeX Frequently Asked Questions.

Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.

Symbols	\advisor 13-15, <u>219</u>	\foreign@doctype	
\@advisor 219,	\arraybackslash	. 148, 157, 165, 766	
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