

# L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> Document Styles for the University of Southampton File version v2.2, dated 2019/03/12

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## 1 Quickstart

This guide assumes you have installed MiKTeX or TeX live distributions. It also requires having the program “make” for producing the templates again.

The folder labelled tex-mf should be installed in your local tex files source or whatever your tex distro uses.

The Templates have been built for the Department of Electronics and Computer Science in the Faculty of Engineering and Physical Science at the University of Southampton.

The basic settings for University, Faculty and School are explained in Section 6

If a user only wishes to change the file for their thesis it is probably easier to navigate to the class file labeled uosthesis and change the department and faculty naming there. This will be located in the subdirectory where you unzipped the files under tex/latex/uosdocs/

## 2 Description

These L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> document classes are designed to produce thesis, mini-thesis, progress, project, report, GDP report and GDP summary report documents which conformed to the University of Southampton guidelines of April 2001. They were updated in Jan 2019 to conform to changes in those guidelines. Specifically copy-right and authorship declaration changes. They are based on the document class `book`, but modify some of its layout decisions. An article class is also provided which is based on the document class `article`.

## 3 The DOCSTRIP modules

The following modules are used in the implementation to direct DOCSTRIP when generating the external files:

thesis	produce the <code>uosthesis</code> document class
minithesis	produce the <code>uosminithesis</code> document class
progress	produce the <code>uosprogress</code> document class
project	produce the <code>uosproject</code> document class
report	produce the <code>uosreport</code> document class
article	produce the <code>uosarticle</code> document class
gdp	produce the <code>uosgdp</code> document class
gdpsummary	produce the <code>uosgdpsummary</code> document class
testthesis	produce an example thesis
testminithesis	produce an example minithesis
testprogress	produce an example progress
testproject	produce an example project
testreport	produce an example report
testarticle	produce an example article
testgdp	produce an example GDP report
testgdpsummary	produce an example GDP summary report
introduction	produce an example introduction chapter
conclusions	produce an example conclusions chapter
appendix	produce an example appendix chapter
figure	produce an example figure file
definitions	produce an example definitions file
references	produce an example references file
bst	produce a bibliography style file
driver	produce a documentation driver file

## 4 Implementation

The checksum is to determine if there has been a truncation in the file during transmission over a network

The class has a custom option to define what colours should be used for links. This option defines `sotoncolour` to use UoS palette colours. Colour Code taken from <http://edshare.soton.ac.uk/10481>

All options are passed on to the `book` or `article` class.

```
1 <{*thesis | minithesis | progress | project | report | article | gdp | gdpsummary}>
```

```
\baseclass
```

```
2 %% ----- Class/Formating Adjustment -----
3 %% Adjust the book class to match the requirements
4 %% Set spacing, line and paragraph options
5 %% Set LaTeX builder options (work break penalties etc.)
6 <{*thesis | minithesis | progress | project | report | gdp | gdpsummary}>
7 \def\baseclass{book}
8 </thesis | minithesis | progress | project | report | gdp | gdpsummary>
9 <{*article}>
10 \def\baseclass{article}
11 </article>

12 \RequirePackage{xcolor}
13 \colorlet{linkBlue}{blue}
14 \colorlet{custGray}{gray}
15 \colorlet{chapRed}{red}
```

```

16 \DeclareOption{sotoncolour}{
17 \definecolor{sotonMarineBlue}{RGB}{1,67,89} % Soton marine blue (P 7469C)
18 \definecolor{sotonGrey}{RGB}{153,153,166} % Soton grey (P 443C)
19 \definecolor{sotonRed}{RGB}{171,18,16} % Soton Red (P 484C)
20 \colorlet{linkBlue}{sotonMarineBlue}
21 \colorlet{custGray}{sotonGrey}
22 \colorlet{chapRed}{sotonRed}
23 }
24 \DeclareOption*{\PassOptionsToClass{\CurrentOption}{\baseclass}}

```

`\@checkoptions` Before we can process the options we must deal with a small problem. That is, we want to change the default options of the `book` or `article` class to `a4paper` and `11pt` or `12pt` but the macro `\ProcessOptions` used by the `book` or `article` class processes the options in the order specified in the file. Because `a4paper` is the first of the paper sizing options it will be overridden by any user defined option. But the same is not true of the font size option `11pt` or `12pt`. To remedy this we define a macro `\@checkoptions{<default>}{<option-list>}` which checks to see if any options in `<option-list>` have been specified and if not adds `<default>` to the option list.

```

25 \def\@checkoptions#1#2{
26   \edef\@curroptions{\@optionlist{\@currname.\@current}}
27   \@tempswafalse
28   \@tfor\@this:=#2\do{
29     \@expandtwoargs\in@{,\@this,}{,\@curroptions,}
30     \ifin@ \@tempswatrue \@break@tfor \fi
31     \let\@this\@empty
32     \if@tempswa \else \PassOptionsToClass{#1}{\baseclass}\fi
33 }

```

With this macro at our disposal we can continue to process the options

```

34 <*thesis | minithesis | progress | report | article | gdp | gdpsummary>
35 \@checkoptions{11pt}{10pt}{11pt}{12pt}
36 </thesis | minithesis | progress | report | article | gdp | gdpsummary>
37 <*project>
38 \@checkoptions{12pt}{10pt}{11pt}{12pt}
39 </project>
40 \PassOptionsToClass{a4paper}{\baseclass}
41 \ProcessOptions\relax

```

and load the `book` or `article` document class with `A4` as the default paper size.

```

42 \LoadClass{\baseclass}

```

## 4.1 Banner

`\bhrule` Provide a function to produce a banner on the output making the location of the current section simpler.

```

43 \newcommand\bhrule{\typeout{-----}}
44 \newcommand\btypeout[1]{\bhrule\typeout{\space #1}\bhrule}

```

## 4.2 Date

`\today` This macro uses the  $\TeX$  primitives `\month`, `\day` and `\year` to provide the date of the  $\LaTeX$ -run in a suitable format.

```
45 <*thesis>
46 \def\today{\ifcase\month\or
47   January\or February\or March\or April\or May\or June\or
48   July\or August\or September\or October\or November\or December\fi
49   \space \number\year}
50 </thesis>
```

## 5 Document Layout

### 5.1 Font

```
51 %% \usepackage[T1]{fontspec}
52 %   Set font for copyright statement body text
53 \usepackage[defaultsans]{droidsans}
54 %   Set a particular style of font for the thesis. A font that has smallcaps
55 \usepackage{mathpazo}
56 %%\usepackage[T1]{fontenc} %This may not be necessary for english only text
```

### 5.2 Spacing

Load the `setspace` package so that spacing can easily be set. The text in all three styles is set to one and a half spacing, paragraphs not indented, and a newline between paragraphs.

```
57 \usepackage{setspace}
58 <thesis | minithesis | progress | project | report | gdp | gdpsummary>\onehalfspacing
59 <article>\singlespacing
60 \setlength{\parindent}{0pt}
61 \setlength{\parskip}{2.0ex plus0.5ex minus0.2ex}
```

### 5.3 Margins

Load the `vmargin` package to setup the page dimensions.

```
62 \usepackage{vmargin}
63 <*thesis | minithesis | progress | project | report | gdp | gdpsummary>
64 \setmarginsrb          { 1.5in} % left margin
65                        { 0.6in} % top margin
66                        { 1.0in} % right margin
67                        { 0.8in} % bottom margin
68                        { 20pt}  % head height
69                        {0.25in} % head sep
70                        { 9pt}   % foot height
71                        { 0.3in} % foot sep
72 </thesis | minithesis | progress | project | report | gdp | gdpsummary>
73 <*article>
74 \setmarginsrb          { 0.8in} % left margin
75                        { 0.6in} % top margin
76                        { 0.8in} % right margin
77                        { 0.8in} % bottom margin
78                        { 20pt}  % head height
```

```

79 {0.25in} % head sep
80 { 9pt} % foot height
81 { 0.3in} % foot sep
82 </article>

```

## 5.4 Breaks

Control how pages and lines are broken.

```

83 \raggedbottom
84 \setlength{\topskip}{1\topskip \@plus 5\p@}
85 \doublehyphendemerits=10000 % No consecutive line hyphens.
86 \brokenpenalty=10000 % No broken words across columns/pages.
87 \widowpenalty=9999 % Almost no widows at bottom of page.
88 \clubpenalty=9999 % Almost no orphans at top of page.
89 \interfootnotelinepenalty=9999 % Almost never break footnotes.

```

## 5.5 Fancy Page Headers

Setup the the default fancy page headers with an underlined header containing chapter, name and page number.

```

90 \usepackage{fancyhdr}
91 % Help from https://texblog.org/2007/11/07/headerfooter-in-latex-with-fancyhdr/#comment-4783
92 \fancyhead[LE]{\textrm\thepage}
93 \fancyhead[LO]{\fancyplain{}{\textsl{\rightmark}}}}
94 \fancyhead[RE]{\fancyplain{}{\textsl{\leftmark}}}}
95 \fancyhead[RO]{\textrm\thepage}
96 \head{}\lfoot{}\rfoot{}\cfoot{}
97 \pagestyle{fancy}
98 \fancypagestyle{plain}{
99   \fancyhf{}
100   \fancyhead[OR]{\thepage}
101   \renewcommand{\headrulewidth}{0pt}
102 }

```

`\chaptermark` Redefine `chaptermark` and `sectionmark` to set up the correct header name and  
`\sectionmark` produce a banner on the output making the location of messages simpler.  
`\subsectionmark` The `\btypeout` command is for console logging where chapters start  
`\chapapp` expands to "Chapter" or "Appendix"

```

103 <thesis | minithesis | progress | project | report | gdp>
104 \renewcommand{\chaptermark}[1]{\btypeout{\thechapter.\space #1}\markboth{\chaptername\ \thechapter}{\thechapter}}
105 \renewcommand{\sectionmark}[1]{\markright{\thesection.\hspace{1em}#1}}
106 \renewcommand{\subsectionmark}[1]{}
107 </thesis | minithesis | progress | project | report | gdp>
108 <*article>
109 \renewcommand{\sectionmark}[1]{\btypeout{\thesection\hspace{1em}}\markboth{}{\thesection.\hspace{1em}#1}}
110 \renewcommand{\subsectionmark}[1]{}
111 \renewcommand{\subsubsectionmark}[1]{}
112 </article>
113 \gdpsummary\markboth{GDP Summary Report}{GDP Summary Report}

```

`\cleardoublepage` Redefine `cleardoublepage` to remove headers from blank pages in twosided documents.

```

114 \def\cleardoublepage{\clearpage\if@twoside \ifodd\c@page\else
115 \hbox{}
116 \thispagestyle{empty}
117 \newpage
118 \if@twocolumn\hbox{}\newpage\fi\fi\fi}

```

`\cleartoeven` Define `cleartoeven` to remove headers from blank pages and force to even page for appendix or index.

```

119 \def\cleartoeven{\clearpage\if@twoside \ifodd\c@page
120 \hbox{}
121 \thispagestyle{empty}
122 \newpage
123 \if@twocolumn\hbox{}\newpage\fi\fi\fi}

```

## 5.6 Mathematics

Load the `amsmath` packages, so we can do some serious math, and setup the theorem environments.

```

124 %% ----- Figure/Table/Equation/Listing Styling -----
125 %% Set the styling for non text elements of the document
126 \usepackage{amsmath,amsfonts,amssymb,amscd,amsthm,xspace}
127 \theoremstyle{plain}
128 \newtheorem{example}{Example}[chapter]
129 \newtheorem{theorem}{Theorem}[chapter]
130 \newtheorem{lemma}{Lemma}[chapter]
131 \newtheorem{proposition}{Proposition}[chapter]
132 \newtheorem{axiom}{Axiom}[chapter]
133 \newtheorem{definition}{Definition}[chapter]
134 \newtheorem{remark}{Remark}[chapter]
135 \newtheorem{corollary}{Corollary}[chapter]
136 \newtheorem{lemma}{Lemma}[chapter]
137 \newtheorem{proposition}{Proposition}[chapter]
138 \newtheorem{axiom}{Axiom}[chapter]
139 \newtheorem{definition}{Definition}[chapter]
140 \newtheorem{remark}{Remark}[chapter]
141 \newtheorem{corollary}{Corollary}[chapter]
142 \newtheorem{lemma}{Lemma}[chapter]
143 \newtheorem{proposition}{Proposition}[chapter]
144 \newtheorem{axiom}{Axiom}[chapter]
145 \newtheorem{definition}{Definition}[chapter]
146 \newtheorem{remark}{Remark}[chapter]
147 \newtheorem{corollary}{Corollary}[chapter]
148 \newtheorem{lemma}{Lemma}[chapter]
149 \newtheorem{proposition}{Proposition}[chapter]
150 \newtheorem{axiom}{Axiom}[chapter]
151 \newtheorem{definition}{Definition}[chapter]
152 \newtheorem{remark}{Remark}[chapter]

```

## 5.7 Captions

`\fref` Load the `caption` package to improve formatting of captions, and provide short  
`\tref` referencing commands.

```

\eref 144 \usepackage[justification=centerlast,font=small,labelfont=sc]{caption}
\cref 145 \setlength{\captionmargin}{20pt}
\sref 146 \newcommand{\fref}[1]{Figure~\ref{#1}}
\aref 147 \newcommand{\tref}[1]{Table~\ref{#1}}
148 \newcommand{\eref}[1]{Equation~\ref{#1}}
149 \newcommand{\cref}[1]{Chapter~\ref{#1}}
150 \newcommand{\sref}[1]{Section~\ref{#1}}
151 \newcommand{\aref}[1]{Appendix~\ref{#1}}

```

## 5.8 Float Placement

`\topfraction` Preventing figures from appearing on a page by themselves. L<sup>A</sup>T<sub>E</sub>X's figure placement algorithm is quite biased in favour of putting figures on a page by themselves, instead of on the top of a page with some text below it. Fortunately, the parameters of the algorithm can be changed. The main problem is that L<sup>A</sup>T<sub>E</sub>X per default only allows a part of the top of a text-page (70%) to contain figures, and requires at least 20% of a page to be text when text and figures share a page. These parameters should be set to more reasonable values, for example 85% and 10%.

```
152 \renewcommand{\topfraction}{0.85}
153 \renewcommand{\bottomfraction}{.85}
154 \renewcommand{\textfraction}{0.1}
155 \renewcommand{\dbltopfraction}{.85}
```

`\floatpagefraction` This helps, but sometimes L<sup>A</sup>T<sub>E</sub>X puts a figure on a page by itself, although it would fit perfectly well on the top of a page. This happens when the figure will not fit on the page where it was defined. L<sup>A</sup>T<sub>E</sub>X then attempts to put it on a figures-only page before it attempts to put it at the top of the next page. A page may contain figures alone if the figure(s) use at least half the page. To prevent half-empty pages this limit should probably be increased to around 75%.

```
156 \renewcommand{\floatpagefraction}{0.75}
157 \renewcommand{\dblfloatpagefraction}{.75}
```

Be careful not to make `floatpagefraction` larger than `topfraction`, then you risk to produce a figure that can neither go on the top of a text page, nor on a page by itself. If that happens, the figure and all later figures will be postponed until next time a `clearpage` is executed (typically at the end of a chapter or the end of the document). This will also happen if a figure is too large to fit on a page.

```
158 \setcounter{topnumber}{9}
159 \setcounter{bottomnumber}{9}
160 \setcounter{totalnumber}{20}
161 \setcounter{dbltopnumber}{9}
```

## 5.9 Graphics

Load the `graphicx` package, so we can include pictures easily. Load the `epstopdf`, so that eps files are automatically converted to pdf when pdfL<sup>A</sup>T<sub>E</sub>X is used. This requires a version of *epstopdf* to be installed on you system. You can find a windows version at

<http://www.ctan.org/tex-archive/support/epstopdf/epstopdf.exe>.

```
162 \usepackage{graphicx}
163 \usepackage{epstopdf}
```

## 5.10 Subfigures and subtables

Load the `subcaption` package, so we can include subfigures easily.

```
164 \usepackage[] {subcaption}
165 \usepackage{booktabs}
166 \usepackage{rotating}
```

## 5.11 Listings

Load the listings package, so we can include listings easily.

```

167 \usepackage{listings}
168 % \usepackage{lstpatch}
169 \lstset{captionpos=b,
170         frame=tb,
171         basicstyle=\scriptsize\ttfamily,
172         showstringspaces=false,
173         keepspaces=true}
174 \lstdefinestyle{matlab} {
175     language=Matlab,
176     keywordstyle=\color{blue},
177     commentstyle=\color[rgb]{0.13,0.55,0.13}\em,
178     stringstyle=\color[rgb]{0.7,0,0} }

```

## 5.12 Hyperlinks

Load the hyperref package to provide hyperlinks in pdf and dvi documents.

```

179 \usepackage[pdfpagemode={UseOutlines},bookmarks=true,bookmarksopen=true,
180     bookmarksopenlevel=0,bookmarksnumbered=true,hypertextnames=false,
181     colorlinks,linkcolor={linkBlue},citecolor={linkBlue},urlcolor={linkBlue},
182     pdfstartview={FitV},unicode,breaklinks=true]{hyperref}
183 \pdfstringdefDisableCommands{
184     \let\\\space
185 }

```

## 6 Internal Names

<p><code>\supervisor</code></p> <p><code>\examiner</code></p> <p><code>\degree</code></p> <p><code>\authors</code></p> <p><code>\addresses</code></p> <p><code>\university</code></p> <p><code>\UNIVERSITY</code></p> <p><code>\department</code></p> <p><code>\DEPARTMENT</code></p> <p><code>\group</code></p> <p><code>\GROUP</code></p> <p><code>\faculty</code></p> <p><code>\FACULTY</code></p> <p><code>\subject</code></p> <p><code>\keywords</code></p>	<p>The various elements of the documents are defined as control sequences to make it easy to customize this style for other parts of the University. When the command is run the other terms are defined by the args.</p> <p>The examiner and supervisor commands can be pluralised so that it can print "Supervisors:". This is with an optional argument. [s] which will add and "s" to the word "Supervisor"</p> <p>186 %% ----- Organisational Structure -----</p> <p>187 \newcommand*\supervisor{2} [] {\def\supname{#2}\def\supplural{#1}}</p> <p>188 \newcommand*\examiner{2} [] {\def\examname{#2}\def\examplural{#1}}</p> <p>189 \newcommand*\degree{1} {\def\degreename{#1}}</p> <p>190 \newcommand*\authors{1} {\def\authornames{#1}}</p> <p>191 \newcommand*\qualifications{1} {\def\quals{#1}}</p> <p>192 \newcommand*\addresses{1} {\def\addressnames{#1}}</p> <p>193 \newcommand*\doi{1} {\def\doicode{#1}}</p> <p>194 \newcommand*\volume{2} {\def\volno{#1}\def\volof{#2}}</p> <p>195 \newcommand*\orcidid{1} {\def\orcid{#1}}</p> <p>196 \newcommand*\university{1} {\def\univname{#1}}</p> <p>197 \newcommand*\UNIVERSITY{1} {\def\UNIVNAME{#1}}</p> <p>198 \newcommand*\department{1} {\def\deptname{#1}}</p> <p>199 \newcommand*\DEPARTMENT{1} {\def\DEPTNAME{#1}}</p> <p>200 \newcommand*\group{1} {\def\groupname{#1}}</p> <p>201 \newcommand*\GROUP{1} {\def\GROUPNAME{#1}}</p>
--	---



```

202 \newcommand*{\faculty}[1]{\def\facname{#1}}
203 \newcommand*{\FACULTY}[1]{\def\FACNAME{#1}}
204 \newcommand*{\subject}[1]{\def\subjectname{#1}}
205 \newcommand*{\keywords}[1]{\def\keywordnames{#1}}

\supname The internal names of the elements are set to defaults appropriate to the Depart-
\examname ment of Electronics and Computer Science.
\degreename By running these commands at the top of your tex file it will overwrite the
\authornames defaults.
\univname 206 %% ----- Organisational Structure -----
\UNIVNAME 207 \doi{}
\deptname 208 \supervisor {}
\DEPTNAME 209 \examiner {}
\groupname 210 \degree {}
\GROUPNAME 211 \authors {}
\facname 212 \qualifications{}
\FACNAME 213 \orcidid{}
\volume{}{}
\subjectname 214 \volume{}{}
\keywordnames 215 \university {\texorpdfstring{\href{http://www.southampton.ac.uk}
216 {University of Southampton}}
217 {University of Southampton}}
218 \UNIVERSITY {\MakeUppercase{\univname}}
219 \department {School of Electronics and Computer Science}
220 \DEPARTMENT {\MakeUppercase{\deptname}}
221 \group {Cyber Physical Systems Group}
222 \GROUP {\MakeUppercase{\groupname}}
223 \faculty {Faculty of Engineering and Physical Science}
224 \FACULTY {\MakeUppercase{\facname}}
225 \addresses {}
226 \subject {}
227 \keywords {}

```

## 7 Special Pages

### 7.1 Title Page

```

\maketitle Setup an appropriate title page and pdf strings if we are using pdfLATEX.
The
global
let
@title
@empty has been removed
Possibly the relax statement also needs to be removed
228 <{*thesis | minithesis | progress | project | report | gdp | gdpsummary}>
229 % Start by Adding meta data to the produced document
230 \usepackage{titling}
231 \AtBeginDocument{
232 \hypersetup{pdftitle={\thetitle}}
233 \hypersetup{pdfsubject={\subjectname}}
234 \hypersetup{pdfauthor={\authornames}}
235 \hypersetup{pdfkeywords={\keywordnames}}
236 }

```

```

237 %    Define the title page layout
238 \renewcommand\maketitle{
239   \btypeout{Title Page}
240   \thispagestyle{empty}
241   \begin{titlepage}
242     \let\footnotesize\small
243     \let\footnoterule\relax
244     \let \footnote \thanks
245     \setcounter{footnote}{0}
246     \null\vfil
247     \vskip 60\p@
248     \begin{center}
249       \setlength{\parskip}{0pt}
250       {\scshape\LARGE\textbf{\univname}\par}
251       %% TODO: Change all the descriptions to italic like the Thesis one
252 <thesis | minithesis | progress | project | gdp | gdpsummary>
253       \bigskip
254       {\large \facname \par}
255 </thesis | minithesis | progress | project | gdp | gdpsummary>
256 <*thesis | minithesis | progress | project>
257       {\large \deptname \par}
258 </thesis | minithesis | progress | project>
259       \vfill
260 <*minithesis>
261       {\large A mini-thesis submitted for transfer from}
262       {\large MPhil to PhD \par}
263 </minithesis>
264 <*progress>
265       {\large A progress report submitted for continuation}
266       {\large towards a PhD \par}
267 </progress>
268 <*project>
269       {\large A project report submitted for the}
270       {\large award of \par \degreename \par}
271 </project>
272 <*gdp>
273       {\large A group design project report submitted for}
274       {\large the award of \par \degreename \par}
275 </gdp>
276 <*gdpsummary>
277       {\large A group design project summary report submitted}
278       {\large for the award of \par \degreename \par}
279 </gdpsummary>
280 <*minithesis | progress | project | gdp | gdpsummary>
281       \vfill
282       {\normalsize Supervisor\supplural: \supname \par}
283       {\normalsize Examiner\examplural: \examname \par}
284       \vfill
285       \hspace{6mm}\parbox[t][51mm][s]{89mm}{
286         \center
287         \vfill
288         {\large \bf \@title \par}
289         \vfill
290         {\normalsize \textit{by} \textbf{authornames \par}

```

```

291      \vfill
292      {\normalsize \@date \par}
293      \vfill
294  }
295  \parbox[t][95mm][s]{89mm}{
296  </minithesis | progress | project | gdp | gdpsummary>
297  <*thesis | report>
298      {\huge \bf \@title \par
299  }
300      \ifthenelse{equal{\doicode}{}}{
301      {}
302      {\smallskip DOI: \href{http://orcid.org/\doicode}{\doicode}\par}
303      \ifthenelse{equal{\volno}{}}{
304      {}
305      {\smallskip Volume \volno{} of \volof}
306      \vfill
307      {\LARGE \textit{by} \par}
308      \smallskip
309      {\LARGE \textbf{authornames}
310      \ifthenelse{equal{\quals}{}}{
311      {}
312      {\par\LARGE
313      \quals}
314      \par}
315      \ifthenelse{equal{\orcid}{}}{
316      {}
317      {\smallskip
318      ORCID: \href{http://orcid.org/\orcid}{\orcid}}
319
320      \vfill
321  <*thesis>
322      {\large \textit{A thesis for the degree of} \par}
323      {\large \textit{Doctor of Philosophy} \par}
324  </thesis>
325  <*report>      {\large \textit{Technical Report} \par}
326      \bigskip
327  \bigskip
328      {\large \facname \par}
329      {\large \deptname \par}
330  </report>
331      \bigskip
332      \bigskip
333      \bigskip
334      {\Large \@date \par}
335      \bigskip
336  </thesis | report>
337      \end{center}
338      \par
339      \@thanks
340      \vfil\null
341  \end{titlepage}
342  \setcounter{footnote}{0}%
343  \global\let\thanks\relax
344  \global\let\maketitle\relax

```

```

345 \global\let\@thanks\@empty
346 \global\let\@author\@empty
347 \global\let\@date\@empty
348 \global\let\title\relax
349 \global\let\author\relax
350 \global\let\date\relax
351 \global\let\and\relax
352 \cleardoublepage
353 }
354 </thesis | minithesis | progress | project | report | gdp | gdpsummary>
355 <*article>
356 \if@titlepage
357 \renewcommand\maketitle{
358 \btypeout{Title Page}
359 \markboth{\authornames}{\@title}
360 \begin{titlepage}
361 \thispagestyle{empty}
362 \let\footnotesize\small
363 \let\footnoterule\relax
364 \let \footnote \thanks
365 \null\vfil
366 \vskip 60\p@
367 \begin{center}
368 {\LARGE \@title \par}
369 \vskip 3em
370 {\large \lineskip .75em
371 \begin{tabular}[t]{c} \authornames \end{tabular}
372 \par}
373 \vskip 1em
374 {\large \lineskip .5em
375 \begin{tabular}[t]{c} \addressnames \end{tabular}
376 \par}
377 \vskip 1.5em
378 {\large \@date \par}
379 \if\keywordnames
380 \else
381 \quotation
382 \vskip 1.5em
383 {\noindent \normalsize
384 \textbf{Keywords:}
385 \textit{\keywordnames}
386 \par}
387 \endquotation
388 \fi
389 \end{center}
390 \par
391 \@thanks
392 \vfil\null
393 \end{titlepage}
394 \setcounter{footnote}{0}
395 \global\let\thanks\relax
396 \global\let\maketitle\relax
397 \global\let\@maketitle\relax
398 \global\let\@thanks\@empty

```

```

399 \global\let\@author\@empty
400 \global\let\@date\@empty
401 \global\let\title\relax
402 \global\let\author\relax
403 \global\let\date\relax
404 \global\let\and\relax
405 }
406 \else
407 \renewcommand\maketitle{
408 \btypeout{Title Page}
409 \markboth{\authornames}{\@title}
410 \thispagestyle{empty}
411 \par
412 \begingroup
413 \renewcommand\thefootnote{\@fnsymbol\c@footnote}
414 \def\@makefnmark{
415 \rlap{\@textsuperscript{\normalfont\@thefnmark}}
416 }
417 \long\def\@makefntext##1{
418 \parindent 1em\noindent \hb@xt@1.8em
419 {\hss\@textsuperscript{\normalfont\@thefnmark}}##1
420 }
421 \if@twocolumn
422 \ifnum \col@number=\@ne
423 \maketitle
424 \else
425 \twocolumn[\maketitle]%
426 \fi
427 \else
428 \newpage
429 % Prevent figures from going at top of page.
430 \global\@topnum\z@
431 \maketitle
432 \fi
433 \thispagestyle{plain}\@thanks
434 \endgroup
435 \setcounter{footnote}{0}%
436 \global\let\thanks\relax
437 \global\let\maketitle\relax
438 \global\let\@maketitle\relax
439 \global\let\@thanks\@empty
440 \global\let\@author\@empty
441 \global\let\@date\@empty
442 \global\let\title\relax
443 \global\let\author\relax
444 \global\let\date\relax
445 \global\let\and\relax
446 }
447 \def\@maketitle{
448 \newpage
449 \null
450 \vskip 2em
451 \begin{center}
452 \let \footnote \thanks

```

```

453     {\LARGE \@title \par}
454     \vskip 1.5em
455     {\large \lineskip .5em
456       \begin{tabular}[t]{c} \authornames \end{tabular}
457     \par}
458     \vskip 0.7em
459     {\large \lineskip .5em
460       \begin{tabular}[t]{c} \addressnames \end{tabular}
461     \par}
462     \vskip 1em
463     {\large \@date}
464   \end{center}
465   \par
466   \vskip 1.5em
467 }
468 \fi
469 \</article>

```

## 7.2 Abstract Page

`\abstract` Setup an appropriate abstract page.

```

470 <*thesis | minithesis | progress | project | report | gdp>
471 \newenvironment{abstract}
472 {
473   \btypeout{Abstract Page}
474   \thispagestyle{empty}
475   \null\vfil
476   \begin{center}
477     \setlength{\parskip}{0pt}
478     {\textsc\normalsize \univname \par}
479     \bigskip
480     {\underline{Abstract} \par}
481     \bigskip
482     {\textsc\normalsize \facname \par}
483 <*thesis | minithesis | progress | project | report>
484     {\textsc\normalsize \deptname \par}
485 </thesis | minithesis | progress | project | report>
486     \bigskip
487 <*thesis>
488     {\normalsize \underline{Doctor of Philosophy}\par}
489 </thesis>
490 <*minithesis>
491     {\normalsize \underline{A mini-thesis submitted for transfer from MPhil to PhD}\par}
492 </minithesis>
493 <*progress>
494     {\normalsize \underline{A progress report submitted for continuation towards a PhD}\par}
495 </progress>
496 <*project>
497     {\normalsize \underline{A project report submitted for the award of \degreename}\par}
498 </project>
499 <*gdp>
500     {\normalsize \underline{A group design project report submitted for the award of \degreename}\par}
501 </gdp>

```

```

502 \bigskip
503 {\normalsize\bf \@title \par}
504 \medskip
505 {\normalsize by \authornames \par}
506 \bigskip
507 \end{center}
508 }
509 {
510 \vfil\vfil\vfil\null
511 \cleardoublepage
512 }
513 </thesis | minithesis | progress | project | report | gdp>
514 <*article>
515 \if@titlepage
516 \renewenvironment{abstract}{
517 \titlepage
518 \null\vfil
519 \@beginparpenalty\@lowpenalty
520 \begin{center}
521 \bfseries \abstractname
522 \@endparpenalty\@M
523 \end{center}
524 \begin{itshape}
525 \noindent
526 }
527 {
528 \par
529 \end{itshape}
530 \if\keywordnames
531 \else
532 \quote
533 \vskip 1.5em
534 {\noindent \normalsize
535 \textbf{Keywords:}
536 \textit{\keywordnames}}
537 \par}
538 \endquote
539 \fi
540 \vfil\null\endtitlepage
541 }
542 \else
543 \renewenvironment{abstract}{
544 \if@twocolumn
545 \section*{\abstractname}
546 \else
547 \small
548 \begin{center}
549 {\bfseries \abstractname\vspace{-.5em}\vspace{\z@}}
550 \end{center}
551 \quote
552 \fi
553 \begin{itshape}
554 }
555 {

```

```

556     \end{itshape}
557     \if\keywordnames
558     \else
559         \vskip 1.5em
560         {\noindent \normalsize
561             \textbf{Keywords:}
562             \textit{\keywordnames}
563         \par}
564     \fi
565     \if@twocolumn\else\endquote\fi
566 }
567 \fi
568 \</article>

```

## 7.3 Contents Pages

Possibly all of these pages should be redone but using the `tocloft` package to reduce complexity in this style file.

### 7.3.1 Add to Table of Contents

`\addtotoc` Get a better list of contents package

Ensures numbering for sub-subsections in the table of contents, and provide for 6 levels to appear in toc. Define `addtotoc` to enable adding elements to the toc at chapter level, using a dummy counter to fix bookmarks in pdfL<sup>A</sup>T<sub>E</sub>X.

```

569 \<thesis | minithesis | progress | project | report | gdp | article>
570 \usepackage[nottoc]{tocbibind} % Put the Lists, Glossary, Biblog and Idx in the conten
571 \addtocounter{secnumdepth}{1}
572 \setcounter{tocdepth}{6}
573 \newcounter{dummy}
574 \newcommand\addtotoc[1]{
575 \refstepcounter{dummy}
576 \<thesis | minithesis | progress | project | report | gdp>
577 \addcontentsline{toc}{chapter}{#1}}
578 \</thesis | minithesis | progress | project | report | gdp>
579 \<*article>
580 \addcontentsline{toc}{section}{#1}}
581 \</article>

```

### 7.3.2 Table of Contents

`\tableofcontents` Adjust line and paragraph spacing.

```

582 \renewcommand\tableofcontents{
583 \hypersetup{linkcolor=black}}
584 \btypeout{Table of Contents}
585 \begin{spacing}{1}{
586     \setlength{\parskip}{1pt}
587     \if@twocolumn
588         \@restonecoltrue\onecolumn
589     \else
590         \@restonecolfalse
591     \fi
592 \<thesis | minithesis | progress | project | report | gdp>

```



```

593     \chapter*{\contentsname
594 \>/thesis | minithesis | progress | project | report | gdp>
595 \< *article>
596     \section*{\contentsname
597 \</article>
598     \@mkboth{
599         \MakeUppercase\contentsname}{\MakeUppercase\contentsname}}
600     \@starttoc{toc}
601     \if@restonecol\twocolumn\fi
602 \<thesis | minithesis | progress | project | report | gdp> \cleardoublepage
603 }\end{spacing}
604 }

```

### 7.3.3 List of Figures

\listoffigures Adjust line and paragraph spacing.

```

605 \renewcommand\listoffigures{
606 \addtotoc{\listfigurename}
607 \begin{spacing}{1}{
608     \setlength{\parskip}{1pt}
609     \if@twocolumn
610         \@restonecoltrue\onecolumn
611     \else
612         \@restonecolfalse
613     \fi
614 \<*thesis | minithesis | progress | project | report | gdp>
615     \chapter*{\listfigurename
616 \>/thesis | minithesis | progress | project | report | gdp>
617 \< *article>
618     \section*{\listfigurename
619 \</article>
620     \@mkboth{\MakeUppercase\listfigurename}
621         {\MakeUppercase\listfigurename}}
622     \@starttoc{lof}
623     \if@restonecol\twocolumn\fi
624 \<*thesis | minithesis | progress | project | report | gdp>
625     \cleardoublepage
626 \>/thesis | minithesis | progress | project | report | gdp>
627 }\end{spacing}
628 }

```

### 7.3.4 List of Tables

\listoftables Adjust line and paragraph spacing.

```

629 \renewcommand\listoftables{
630 \addtotoc{\listtablename}
631 \begin{spacing}{1}{
632     \setlength{\parskip}{1pt}
633     \if@twocolumn
634         \@restonecoltrue\onecolumn
635     \else
636         \@restonecolfalse
637     \fi

```

```

638 <*thesis | minithesis | progress | project | report | gdp>
639     \chapter*{\listtablename
640 </thesis | minithesis | progress | project | report | gdp>
641 <*article>
642     \section*{\listtablename
643 </article>
644     \@mkboth{
645         \MakeUppercase\listtablename}{\MakeUppercase\listtablename}}
646     \@starttoc{lot}
647     \if@restonecol\twocolumn\fi
648 <*thesis | minithesis | progress | project | report | gdp>
649     \cleardoublepage
650 </thesis | minithesis | progress | project | report | gdp>
651 } \end{spacing}
652 }

```

### 7.3.5 List of Symbols

`\listsymbolname` Provide a `listofsymbols` command to produce a list of symbols,

```

\listofsymbols 653 <*thesis | minithesis | progress | report | article>
654 \newcommand\listsymbolname{Definitions and Abbreviations}
655 </thesis | minithesis | progress | report | article>
656 <*project | gdp>
657 \newcommand\listsymbolname{List of Symbols}
658 </project | gdp>
659 \usepackage{longtable}
660 \newcommand\listofsymbols[2]{
661     \btypeout{\listsymbolname}
662     \addtotoc{\listsymbolname}
663 <*thesis | minithesis | progress | project | report | gdp>
664     \chapter*{\listsymbolname
665 </thesis | minithesis | progress | project | report | gdp>
666 <*article>
667     \section*{\listsymbolname
668 </article>
669     \@mkboth{
670         \MakeUppercase\listsymbolname}{\MakeUppercase\listsymbolname}}
671 \begin{longtable}[c]{#1#2}\end{longtable}\par
672 <*thesis | minithesis | progress | project | report | gdp>
673     \cleardoublepage
674 </thesis | minithesis | progress | project | report | gdp>
675 }
676 </thesis | minithesis | progress | project | report | gdp | article>

```

### 7.3.6 List of Additional Material

`\addmaterialname` Provide a `listofaddmaterial` command to produce a list of additional material,  
`\listofaddmaterial` the name can be changed with `\addmaterialname{NewName}`  
`\addtolom` Material can be added by using `\addcontentsline{lom}{chapter}{Material Name}`

```

677 \newcommand\addmaterialname{List of Additional Material}
678 \newcommand\listofaddmaterial{
679 \addtotoc{\addmaterialname}
680 \begin{spacing}{1}{

```

```

681 \setlength{\parskip}{1pt}
682 \if@twocolumn
683 \@restonecoltrue\onecolumn
684 \else
685 \@restonecolfalse
686 \fi
687 <*thesis | minithesis | progress | project | report | gdp>
688 \chapter*{\addmaterialname
689 </thesis | minithesis | progress | project | report | gdp>
690 <*article>
691 \section*{\addmaterialname
692 </article>
693 \@mkboth{
694 \MakeUppercase\addmaterialname}\MakeUppercase\addmaterialname}}
695 \starttoc{lom}
696 \if@restonecol\twocolumn\fi
697 <*thesis | minithesis | progress | project | report | gdp>
698 \cleardoublepage
699 </thesis | minithesis | progress | project | report | gdp>
700 }\end{spacing}
701 }
702 \newcommand\addtolom[1]{%
703 \addtocontents{lom}{\protect\contentsline{chapter}{\protect\numberline{}}{#1}{}}
704 }

```

## 7.4 Declaration of Authorship

\authorshipdeclaration Taken from Modified Template by Lovell 9.3

TODO: Consider a separate dissertation class for non technical?

TODO: Provide extra argument for putting the date into the Declaration

TODO: make slightly different declarations for theses and projects

This Authorship macro takes one argument for the case of People who have published part of their thesis already (perhaps in a paper).

xifthen else package used for the isempty command

```

705 <*thesis | minithesis | progress | report | article>
706 \usepackage{xifthen}
707 \newcommand\authorshipdeclaration[1]{
708 \btypeout{Declaration of Authorship}
709 \addtotoc{Declaration of Authorship}
710 \thispagestyle{plain}
711 \null\vfil
712 \vskip 60\p@
713 \begin{center}{\Large\bf Declaration of Authorship \par}\end{center}
714 I declare that this thesis and the work presented in it is my own and has
715 been generated by me as the result of my own original research.
716
717 I confirm that:
718
719 \begin{enumerate}
720 \item This work was done wholly or mainly while in candidature for a research degree at this U
721 \item Where any part of this thesis has previously been submitted for a degree or any other q
722 \item Where I have consulted the published work of others, this is always clearly attributed;
723 \item Where I have quoted from the work of others, the source is always given. With the except

```

```

724 \item I have acknowledged all main sources of help;
725 \item Where the thesis is based on work done by myself jointly with others, I have made clear
726
727 \ifthenelse{\isempty{#1}}
728 {\item None of this work has been published before submission}
729 {\item Parts of this work have been published as: #1}
730 \end{enumerate}
731
732 \vspace{15.0mm}
733 \begin{minipage}[t]{0.7\textwidth}
734   Signed:.....
735 \end{minipage}%
736 \begin{minipage}[t]{0.3\textwidth}
737   Date:.....
738 \end{minipage}
739 \vfil\vfil\null
740 \cleardoublepage
741 }
742 </thesis | minithesis | progress | report | article>

```

## 7.5 Copyright Statement

`\copyrightDeclaration` This standard Copyright statement is to be included for a thesis submission to University of Southampton Digital Repository

```

743 <*thesis>
744 \usepackage[export]{adjustbox} % for Soton logo alignment
745 \newcommand\copyrightDeclaration[1]{
746
747 \btypeout{Copyright declaration}
748 \thispagestyle{plain}
749
750 \hspace{-1.5in}\hspace{2.5cm}\begin{minipage}{17cm}
751 \null\vfil
752 \includegraphics[width=6cm,right]{UoSLogo.png}
753
754 \vskip 60\p@
755 \begin{center}{\selectfont\huge
756 \textcolor{custGray}{University~of~Southampton~Research~Repository}}\par}
757 \end{center}
758 \vspace{1cm}
759
760 {\fontfamily{fds}\selectfont
761
762 \noindent Copyright \textcopyright~ and Moral Rights for this thesis and, where
763 applicable, any accompanying data are retained by the author and/or other
764 copyright owners. A copy can be downloaded for personal non-commercial research
765 or study, without prior permission or charge. This thesis and the accompanying
766 data cannot be reproduced or quoted extensively from without first obtaining
767 permission in writing from the copyright holder/s. The content of the thesis
768 and accompanying research data (where applicable) must not be changed in any
769 way or sold commercially in any format or medium without the formal permission
770 of the copyright holder/s.
771

```

```

772 \vspace{0.5cm}
773
774 When referring to this thesis and any accompanying data, full bibliographic
775 details must be given, e.g.
776
777 \vspace{0.5cm}
778
779 Thesis: Author (Year of Submission) "Full thesis title", University of
780 Southampton, name of the University Faculty or School or Department,
781 PhD Thesis, pagination.
782
783 \vspace{0.5cm}
784
785 Data: Author (Year) Title. URI [dataset]]
786 \end{minipage}
787 \vfil\vfil\null
788 \cleardoublepage
789 }
790
791 \usepackage{lastpage} % counts the full number of pages
792
793 \</thesis>

```

## 7.6 Acknowledgements

`\acknowledgements` Thank someone!

```

794 \newcommand\acknowledgements[1]{
795 \btypeout{Acknowledgements}
796 \addtotoc{Acknowledgements}
797 \<thesis | minithesis | progress | project | report | gdp>
798 \thispagestyle{plain}
799 \null\vfil
800 \vskip 60\p@
801 \begin{center}{\Large\bf Acknowledgements \par}\end{center}
802 {\normalsize #1}
803 \vfil\vfil\null
804 \cleardoublepage
805 \</thesis | minithesis | progress | project | report | gdp>
806 \<article>
807 \section*{Acknowledgements}
808 {\normalsize #1}
809 \</article>
810 }

```

## 7.7 Dedicatory

`\dedicatory` Dedicate the document to someone!

```

811 \newcommand\dedicatory[1]{
812 \btypeout{Dedicatory}
813 \<thesis | minithesis | progress | project | report | gdp>
814 \thispagestyle{plain}
815 \null\vfil
816 \vskip 60\p@

```

```

817 \begin{center}{\Large \sl #1}\end{center}
818 \vfil\null
819 \cleardoublepage
820 </thesis | minithesis | progress | project | report | gdp>
821 }

```

## 8 Parts

```

\frontmatter Define frontmatter,mainmatter,backmatter for the article class and rename the
\mainmatter bibliography to something that makes more sense. For other classes make the
\backmatter Appendix entry in the table of contents better and rename the references in a
\appendix slightly different way.

822 <*article>
823 \newcommand\frontmatter{ }
824 \newcommand\mainmatter{ }
825 \newcommand\bibname{References}
826 \newcommand\backmatter{}
827 </article>
828 <*thesis | minithesis | progress | project | report | gdp>
829 \renewcommand\bibname{References}
830 \let\oldappendix\appendix % Put full appendix name in ToC
831 \renewcommand\appendix{%
832   \oldappendix
833   \let\oldacl@pp=\addcontentsline
834   \def\addcontentsline##1##2##3{\oldacl@pp{##1}{##2}{\appendixname\space ##3}}
835 }
836 \let\oldbackmatter\backmatter
837 \def\backmatter{%
838   \oldbackmatter
839   \let\addcontentsline=\oldacl@pp
840 }
841 </thesis | minithesis | progress | project | report | gdp>

842 </thesis | minithesis | progress | project | report | article | gdp | gdpsummary>

```

## 9 Example Documents

```

843 <*testthesis>
844 \documentclass[sotoncolour]{uostthesis} % Use the Thesis Style with custom link colour
845 </testthesis>
846 <*testminithesis>
847 \documentclass[sotoncolour]{uosminithesis} % Use the minithesis Style with custom link colour
848 </testminithesis>
849 <*testprogress>
850 \documentclass[sotoncolour]{uosprogress} % Use the progress Style with custom link colour
851 </testprogress>
852 <*testproject>
853 \documentclass[sotoncolour]{uosproject} % Use the Project Style with custom link colour
854 </testproject>
855 <*testreport>
856 \documentclass[sotoncolour]{uosreport} % Use the Report Style with custom link colour
857 </testreport>

```

```

858 <*testarticle>
859 \documentclass[sotoncolour]{uosarticle}      % Use the Article Style with custom link colour
860 </testarticle>
861 <*testgdp>
862 \documentclass[sotoncolour]{uosgdp}          % Use the GDP Report Style with custom link colour
863 </testgdp>
864 <*testgdpsummary>
865 \documentclass[sotoncolour]{uosgdpsummary}    % Use the GDP Summary Report Style with custom link
866 </testgdpsummary>
867 <*testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary>
868 \graphicspath{{../Figures/}}                % Location of your graphics files
869 \usepackage{natbib}                          % Use Natbib style for the refs.
870 <*testthesis | testminithesis | testproject | testreport | testgdp>
871 \usepackage{bibentry}                       % Use bibentry for prepublished works
872 \nobibliography*                            % Use bibentry for prepublished works
873 \usepackage{attrib}                         % Use the attrib package for quotations
874 </testthesis | testminithesis | testproject | testreport | testgdp>
875 \hypersetup{colorlinks=true}                % Set to false for black/white printing
876 \input{Definitions}                         % Include your abbreviations
877 %% -----
878 %% -----THESIS/DOC INFORMATION -----
879 \department {School of [Insert school]}
880 \DEPARTMENT {\MakeUppercase{\deptname}}
881 \group      {[Group name]}
882 \GROUP      {\MakeUppercase{\groupname}}
883 \faculty    {Faculty of [Insert faculty]}
884 \FACULTY    {\MakeUppercase{\facname}}
885 \title      {An Investigation into \dots}
886 <*testthesis>
887 \authors    {Insert name, for example, Sarah Alison Watson} % Use of Soton Email unadvised, us
888 </testthesis>
889 <*testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary>
890 \authors    {\texorpdfstring
891              {\href{mailto:S.A.Watson@soton.ac.uk}{Name and email, for example, Sarah Alison W
892              {Name and email, for example, Sarah Alison Watson}
893              }
894 </testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary>
895 \addresses  {\groupname\\deptname\\univname}
896 \date       {\today}
897 <*testminithesis | testprogress | testproject | testgdp | testgdpsummary>
898 % \supervisor[s] {Mr Beavis and Mrs S Supervisor}
899 \supervisor {Mr Beavis}
900 % \examiner[s] {Dr Butthead and Dr A.N. Other}
901 \examiner   {Dr Butthead}
902 </testminithesis | testprogress | testproject | testgdp | testgdpsummary>
903 <*testproject>
904 \degree     {BEng Electronic Engineering}
905 </testproject>
906 <*testgdp | testgdpsummary>
907 \degree     {Master of Engineering}
908 </testgdp | testgdpsummary>
909 %% Optional Fields
910 <testthesis | testminithesis | testprogress> \qualifications{MEng PhD}
911 <*testthesis>

```

```

912 \orcidid{0000-0002-1825-0097}
913 \doi{10.1002/0470841559.ch1}
914 \volume{n}{m} %Optional Volume Numbering Volume n of m
915 \testthesis)
916 \subject {}
917 \keywords {}
918
919 \begin{document}
920 %% ----- FRONT MATTER ORGANISATION -----
921 (*testthesis)
922 \pagenumbering{gobble} % removes page number
923 \copyrightDeclaration{} % !!! Comment this line when printing the hardcopy !!!
924 \raggedright %% Set the style to Left justification, remove for fill justification
925 %% Must be done after copyrightDeclaration
926 \testthesis)
927 \frontmatter
928 \maketitle
929 \testthesis|testminithesis|testprogress|testproject|testreport|testarticle|testgdp|testgdpsummary)
930 (*testthesis|testminithesis|testprogress|testproject|testreport|testarticle|testgdp)
931 \begin{abstract}
932 This work is all about \dots
933 (*testthesis|testminithesis|testprogress)
934 There are broad instructions for this template entitled: How to use the University of Southampton
935
936 There is no prescribed font, you should use a font appropriate to your discipline. See Product
937 \testthesis|testminithesis|testprogress)
938 \end{abstract}
939 (*testthesis|testminithesis|testprogress|testproject|testreport|testgdp)
940 \tableofcontents
941 \listoffigures
942 \listoftables
943 %% The List of listings does not, by default, appear in the ToC, so....
944 \addtotoc{Listings}
945 \lstlistoflistings
946 \listofaddmaterial
947 \addtolom{Material Name e.g Map}
948 \addtolom{Material Name e.g CD}
949 \addtolom{Test Material}
950 (*testthesis|testminithesis|testproject|testreport|testgdp)
951 %% ----- AUTHORSHIP DECLARATION/ ACKNOW. / DEDICATORY -----
952 %% Either include citations like below (as many as required spaced with commas or 'and').
953 %% \bibentry command must be used here with prepublished papers
954 % https://www.stefaanlippens.net/bibentry/
955 \authorshipdeclaration{\bibentry{Gunn:2001:pdflatex}, \bibentry{Lovell:2011:updated} and \bibentry{...}}
956 %% Or state no citations like below
957 %% \authorshipdeclaration{}
958 %% -----
959 \acknowledgements{Thanks to no one.}
960 \dedicatory{To \dots}
961 \testthesis|testminithesis|testproject|testreport|testgdp)
962 %%Lightweight Definitions and Abbreviations see package:nomencl for alternative
963 %% Include if relevant to discipline
964 \listofsymbols{lll}{\$w\$ & The weight vector\$\$S\$ & If relevant to discipline}
965 \testthesis|testminithesis|testprogress|testproject|testreport|testgdp)

```



```

966 </testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp>
967 < *testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary>
968 \mainmatter
969 %% ----- MAIN MATTER (CONTENT) -----
970 </testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary>
971 < *testthesis | testminithesis | testprogress | testproject | testreport | testgdp>
972 \include{Introduction}
973 \include{Conclusions}
974 \begin{lstlisting}[caption=Without a title it doesn't appear in the table]
975 This is a test listing
976
977 It has several lines
978 That
979 say not much at all
980 \end{lstlisting}
981 \appendix
982 \include{AppendixA}
983 \backmatter
984 < *testthesis | testminithesis | testprogress>
985 \chapter{Glossary [if relevant]}
986 </testthesis | testminithesis | testprogress>
987 \bibliographystyle{uos}
988 \bibliography{UOS}
989 < *testthesis | testminithesis | testprogress>
990 \chapter{Bibliography}
991 To use bibliography as well as the references section use the \texttt{multibbl} package.
992 \chapter{Index [if relevant]}
993 </testthesis | testminithesis | testprogress>
994 </testthesis | testminithesis | testprogress | testproject | testreport | testgdp>
995 < *testgdpsummary>
996 \section*{Introduction}
997 \section*{Objectives}
998 \section*{Resources}
999 \section*{Constraints}
1000 \section*{Approaching the task}
1001 \section*{Team Organisation}
1002 \section*{Important Results}
1003 \section*{Conclusions}
1004 \section*{Recommendations}
1005 </testgdpsummary>
1006 < *introduction>
1007 \chapter{Introduction} \label{Chapter:Introduction}
1008 </introduction>
1009 < *testarticle>
1010 \section{Introduction} \label{Section:Introduction}
1011 </testarticle>
1012 < *introduction | testarticle>
1013 You probably found all the files from \cite{Gunn:2001:pdflatex}.
1014 \tref{Table:tabex} illustrates the results of my work.
1015 \begin{table}[!htb]
1016 \centering
1017 \begin{tabular}{cc}
1018 \toprule
1019 \textbf{Training Error} & \textbf{Testing Error} \\

```

```

1020 \midrule
1021 0 & $\infty$\\
1022 \bottomrule
1023 \end{tabular}
1024 \caption{The Results}
1025 \label{Table:tabex}
1026 \end{table}
1027
1028 \fref{Figure:figex} shows why this is the case.
1029 \begin{figure}[!htb]
1030 \centering
1031 \includegraphics[width=8cm]{figure}
1032 \caption{A colourful picture.}
1033 \label{Figure:figex}
1034 \end{figure}
1035
1036 This page shows you a subfigure example in \fref{Figure:figsubex}.
1037 \begin{figure}[!htb]
1038 \centering
1039 \subcaptionbox{The left caption}{
1040 \includegraphics[width=4.2cm]{figure}
1041 \label{Figure:figsubex:left}
1042 }
1043 \subcaptionbox{The right caption}{
1044 \includegraphics[width=4.2cm]{figure}
1045 \label{Figure:figsubex:right}
1046 }
1047 \caption{A doubly colourful picture.}
1048 \label{Figure:figsubex}
1049 \end{figure}
1050 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec rutrum sodales ligula, ac aliquam
1051
1052 \section{A Section of a chapter}
1053 Nulla molestie velit sed dui ullamcorper viverra. Fusce placerat vulputate lacus eu consequat.
1054
1055 \subsection{Some quotes}
1056
1057 Nam egestas felis euismod erat tincidunt ornare. Nulla hendrerit tempor purus ac consequat. Aliquam
1058 \begin{quote}
1059 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec rutrum sodales ligula, ac aliquam
1060 \end{quote}
1061
1062 Pellentesque sodales lobortis feugiat. Vivamus volutpat mauris id odio aliquam maximus sed sit amet
1063 \begin{quote}
1064 The \verb|\attrib| macro attributes block elements, for example when citing
1065 a reference after a block quotation.
1066 \attrib{\cite{attribpackage}}
1067 \end{quote}
1068
1069 Donec vitae massa nisi. Praesent sed sollicitudin urna. Suspendisse vitae cursus tortor. In egestas
1070 \</introduction|testarticle>
1071 \<conclusions>
1072 \chapter{Conclusions} \label{Chapter: Conclusions}
1073 \</conclusions>

```

```

1074 <*testarticle>
1075 %% -----
1076 \section{Conclusions} \label{Section: Conclusions}
1077 </testarticle>
1078 <*conclusions | testarticle>
1079 It works.
1080 </conclusions | testarticle>
1081 <*testarticle>
1082 \acknowledgements{Thanks to no one.}
1083 \backmatter
1084 \appendix
1085 \bibliographystyle{uos}
1086 \bibliography{UOS}
1087 </testarticle>
1088 <*appendix | testarticle>
1089 <*appendix>
1090 \chapter{Stuff} \label{Chapter:Stuff}
1091 </appendix>
1092 <*testarticle>
1093 %% -----
1094 \section{Stuff} \label{Section:Stuff}
1095 </testarticle>
1096 The following gets in the way of the text....
1097 </appendix | testarticle>
1098 <*testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary>
1099 \end{document}
1100 %% -----
1101 </testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary>

```

## 9.1 Example Figure

```

1102 <*figure>
1103 %%BoundingBox: 0 150 600 650
1104 %%EndComments
1105 0.0 setlinewidth
1106 /length 0.1 def
1107 /width 0.02 def
1108 /hsvcircle {
1109   gsave
1110     /h 0.0 def
1111     0 4 360 {
1112       pop
1113       gsave
1114         0.5 0.0 translate
1115         newpath
1116         0.0 0.0 moveto
1117         length 0.0 lineto
1118         length width lineto
1119         0.0 width lineto
1120         closepath
1121         h 1.0 1.0 sethsbcolor
1122         fill
1123       grestore
1124       /h h 4 360 div add def
1125       4 rotate

```

```

1126     } for
1127 grestore
1128 } def
1129 0.0 setlinewidth
1130 0.0 setgray
1131 300 400 translate
1132 500 500 scale
1133 30 rotate
1134 1.0 0.7 scale
1135 -30 rotate
1136 hsvcircle
1137 0.8 0.8 scale
1138 hsvcircle
1139 0.8 0.8 scale
1140 hsvcircle
1141 0.8 0.8 scale
1142 hsvcircle
1143 0.8 0.8 scale
1144 hsvcircle
1145 0.8 0.8 scale
1146 hsvcircle
1147 0.8 0.8 scale
1148 hsvcircle
1149 showpage
1150 </figure>

```

## 9.2 Definitions File

```

1151 (*definitions)
1152 \newcommand{\BibTeX}{\rm B\kern-.05em{\sc i\kern-.025em b}\kern-.08em T\kern-.1667em\lower.7
1153
1154 %% People
1155 \newcounter{address}
1156 \setcounter{address}{1}
1157 \renewcommand{\theaddress}{\textsuperscript{\fnsymbol{address}}}
1158 \newcommand{address}[1]{\refstepcounter{address}\theaddress#1\}
1159 \newcommand{Name}[3]{\texorpdfstring{\href{mailto:#3}{#2}#1}{#2}\xspace}
1160 \newcommand{SteveRGunn}[1]{\Name{#1}{Steve R. Gunn}{S.R.Gunn@ecs.soton.ac.uk}}
1161
1162 %% Dingbats
1163 \newcommand{tick}{\ding{51}}
1164 \newcommand{cross}{\ding{55}}
1165
1166 %% Calculus
1167 \newcommand{pd}[2]{\ensuremath{\frac{\partial #1}{\partial #2}}\xspace}
1168 \newcommand{fd}[2]{\ensuremath{\frac{d #1}{d #2}}\xspace}
1169 \newcommand{dint}{\ensuremath{\int\!\!\!\int}\xspace}
1170 \newcommand{tint}{\ensuremath{\int\!\!\!\int\!\!\!\int}\xspace}
1171
1172 %% Math Sets
1173 \newcommand{Q}[1]{\ensuremath{\mathbb{#1}}\xspace}
1174 \newcommand{R}{\mathbb{R}}
1175
1176 %% Matrix, Vector
1177 \newcommand{V}[1]{\ensuremath{\boldsymbol{#1}}\xspace}

```

```

1178 \newcommand{\M}[1]{\ensuremath{\boldsymbol{\#1}}\xspace}
1179 \newcommand{\0}{\V{0}}
1180 \newcommand{\1}{\V{1}}
1181 \newcommand{\I}{\M{I}}
1182
1183 %% Math Functions
1184 \newcommand{\F}[1]{\ensuremath{\mathrm{\#1}}\xspace}
1185 \newcommand{\sgn}{\F{sgn}}
1186 \newcommand{\tr}{\F{trace}}
1187 \newcommand{\diag}{\F{diag}}
1188
1189 %% Math Names
1190 \newcommand{\N}[1]{\ensuremath{\mathit{\#1}}\xspace}
1191
1192 %% Data
1193 \newcommand{\mc}[1]{\ensuremath{\mathcal{\#1}}\xspace}
1194 \newcommand{\Hyp}{\mc{H}}
1195 \newcommand{\D}{\mc{D}}
1196
1197 %% Kernel
1198 \newcommand{\K}{\M{K}}
1199 \newcommand{\eins}{\texorpdfstring{\ensuremath{\epsilon}}{\textepsilon}-insensitive\xspace}
1200 \newcommand{\e}{\ensuremath{\epsilon}\xspace}
1201 \newcommand{\Bxi}{\ensuremath{\boldsymbol{\xi}}\xspace}
1202 \newcommand{\Kanova}{\ensuremath{\mathit{K}_{\text{ANOVA}}}\xspace}
1203 \newcommand{\Kspline}{\ensuremath{\mathit{K}_{\text{spline}}}\xspace}
1204
1205 %% Bayesian
1206 \newcommand{\MP}{\ensuremath{\mathit{\scriptscriptstyle \hspace{-1.5pt}M\hspace{-1.5pt}P}}\xspace}
1207 \newcommand{\ML}{\ensuremath{\mathit{\scriptscriptstyle \hspace{-1.5pt}M\hspace{-1.5pt}L}}\xspace}
1208 \newcommand{\Qw}{\ensuremath{Q_{\w}(\w)}\xspace}
1209 \newcommand{\Qa}{\ensuremath{Q_{\Ba}(\Ba)}\xspace}
1210 \newcommand{\Qb}{\ensuremath{Q_{\beta}(\beta)}\xspace}
1211 \newcommand{\wMPab}{\ensuremath{w_{\MP|\bar{\Ba},\bar{\beta}}}\xspace}
1212 \newcommand{\wMP}{\ensuremath{w_{\MP}}\xspace}
1213 \newcommand{\yMP}{\ensuremath{y_{\MP}}\xspace}
1214 \newcommand{\BaMP}{\ensuremath{\Ba_{\hspace{1pt}\MP}}\xspace}
1215 \newcommand{\aMP}{\ensuremath{\alpha_{\hspace{1pt}\MP}}\xspace}
1216 \newcommand{\bMP}{\ensuremath{\beta_{\hspace{1pt}\MP}}\xspace}
1217 \newcommand{\Sab}{\ensuremath{M_{\Sigma}_{\bar{\Ba},\bar{\beta}}}\xspace}
1218 \newcommand{\Ba}{\ensuremath{\boldsymbol{\alpha}}\xspace}
1219 \newcommand{\Bb}{\ensuremath{\boldsymbol{\beta}}\xspace}
1220 \newcommand{\Bm}{\ensuremath{\boldsymbol{\mu}}\xspace}
1221 \newcommand{\BL}{\ensuremath{\boldsymbol{\Lambda}}\xspace}
1222 \newcommand{\BPhi}{\ensuremath{\boldsymbol{\Phi}}\xspace}
1223 \newcommand{\SMP}{\ensuremath{M_{\Sigma}_{\MP}}\xspace}
1224
1225 \newcommand{\Pa}{\ensuremath{P(\alpha|\mathcal{H})}\xspace}
1226 \newcommand{\Pb}{\ensuremath{P(\beta|\mathcal{H})}\xspace}
1227 \newcommand{\Pab}{\ensuremath{P(\alpha,\beta|\mathcal{H})}\xspace}
1228 \newcommand{\Pw}{\ensuremath{P(\w|\mathcal{H})}\xspace}
1229 \newcommand{\PD}{\ensuremath{P(\D|\mathcal{H})}\xspace}
1230 \newcommand{\PwIa}{\ensuremath{P(\w|\alpha,\mathcal{H})}\xspace}
1231 \newcommand{\PDIwb}{\ensuremath{P(\D|\w,\beta,\mathcal{H})}\xspace}

```

```

1232 \newcommand{\PDwab}{\ensuremath{P(\!D,\!w,\!\alpha,\!\beta|\!\mathcal{H})}\!}\xspace}
1233 \newcommand{\PDIw}{\ensuremath{P(\!D|\!w,\!\mathcal{H})}\!}\xspace}
1234 \newcommand{\PwID}{\ensuremath{P(\!w|\!D,\!\mathcal{H})}\!}\xspace}
1235 \newcommand{\PwabID}{\ensuremath{P(\!w,\!\alpha,\!\beta|\!D,\!\mathcal{H})}\!}\xspace}
1236
1237 \newcommand{\PanH}{\ensuremath{P(\!\alpha)\!}\!}\xspace}
1238 \newcommand{\PbnH}{\ensuremath{P(\!\beta)\!}\!}\xspace}
1239 \newcommand{\PabnH}{\ensuremath{P(\!\alpha,\!\beta)\!}\!}\xspace}
1240 \newcommand{\PwnH}{\ensuremath{P(\!w)\!}\!}\xspace}
1241 \newcommand{\PDnH}{\ensuremath{P(\!D)\!}\!}\xspace}
1242 \newcommand{\PwIaH}{\ensuremath{P(\!w|\!\alpha)\!}\!}\xspace}
1243 \newcommand{\PDIwbH}{\ensuremath{P(\!D|\!w,\!\beta)\!}\!}\xspace}
1244 \newcommand{\PDwabnH}{\ensuremath{P(\!D,\!w,\!\beta,\!\alpha)\!}\!}\xspace}
1245 \newcommand{\PDIwnH}{\ensuremath{P(\!D|\!w)\!}\!}\xspace}
1246 \newcommand{\PwIDnH}{\ensuremath{P(\!w|\!D)\!}\!}\xspace}
1247 \newcommand{\PwabIDnH}{\ensuremath{P(\!w,\!\alpha,\!\beta|\!D)\!}\!}\xspace}
1248
1249 \newcommand{\PDwBab}{\ensuremath{P(\!D,\!w,\!\beta,\!\alpha|\!\mathcal{H})}\!}\xspace}
1250 \newcommand{\PwIBa}{\ensuremath{P(\!w|\!\beta,\!\mathcal{H})}\!}\xspace}
1251 \newcommand{\PBab}{\ensuremath{P(\!\beta,\!\alpha|\!\mathcal{H})}\!}\xspace}
1252 \newcommand{\PwBabID}{\ensuremath{P(\!w,\!\beta,\!\alpha|\!D,\!\mathcal{H})}\!}\xspace}
1253
1254 \newcommand{\PBanH}{\ensuremath{P(\!\beta)\!}\!}\xspace}
1255 \newcommand{\PwIBanH}{\ensuremath{P(\!w|\!\beta)\!}\!}\xspace}
1256
1257 %% Snakes
1258 \newcommand{\Esnake}{\ensuremath{\mathit{E}_{\text{snake}}}\!}\xspace}
1259 \newcommand{\Eimage}{\ensuremath{\mathit{E}_{\text{image}}}\!}\xspace}
1260 \newcommand{\Econt}{\ensuremath{\mathit{E}_{\text{cont}}}\!}\xspace}
1261 \newcommand{\Ecurv}{\ensuremath{\mathit{E}_{\text{curv}}}\!}\xspace}
1262 \newcommand{\Eint}{\ensuremath{\mathit{E}_{\text{int}}}\!}\xspace}
1263 \newcommand{\Eext}{\ensuremath{\mathit{E}_{\text{ext}}}\!}\xspace}
1264 \newcommand{\Eterm}{\ensuremath{\mathit{E}_{\text{term}}}\!}\xspace}
1265 \newcommand{\Eline}{\ensuremath{\mathit{E}_{\text{line}}}\!}\xspace}
1266 \newcommand{\Edge}{\ensuremath{\mathit{E}_{\text{edge}}}\!}\xspace}
1267 \newcommand{\Econ}{\ensuremath{\mathit{E}_{\text{con}}}\!}\xspace}
1268 \newcommand{\Eangle}{\ensuremath{\mathit{E}_{\text{angle}}}\!}\xspace}
1269 \newcommand{\Elshape}{\ensuremath{\mathit{E}_{\text{lshape}}}\!}\xspace}
1270 \newcommand{\Eedgedir}{\ensuremath{\mathit{E}_{\text{edgedir}}}\!}\xspace}
1271 \newcommand{\Emodel}{\ensuremath{\mathit{E}_{\text{model}}}\!}\xspace}
1272 \newcommand{\wte}{\ensuremath{\mathit{w}_{\text{term}}}\!}\xspace}
1273 \newcommand{\wli}{\ensuremath{\mathit{w}_{\text{line}}}\!}\xspace}
1274 \newcommand{\wed}{\ensuremath{\mathit{w}_{\text{edge}}}\!}\xspace}
1275 \newcommand{\wco}{\ensuremath{\mathit{w}_{\text{con}}}\!}\xspace}
1276
1277
1278 %% Environments
1279 \newcounter{alg}
1280 \newenvironment{algorithm}[1]
1281 {
1282   \stepcounter{alg}
1283   \begin{table}[htb]
1284     \centering
1285     \begin{tabular}[t]{l}

```

```

1286 \hline&\\
1287 \multicolumn{2}{l}{\bf Algorithm \arabic{alg}: #1}\&\\
1288 } {
1289 &\\
1290 \hline
1291 \end{tabular}
1292 \end{table}
1293 }
1294 \</definitions>

```

### 9.3 References File

```

1295 \<{*references}
1296 @MISC{Gunn:2001:pdflatex,
1297   author =      {S.R. Gunn},
1298   title =       {PDFLaTeX Instructions},
1299   year =        {2001},
1300   url =         {http://www.ecs.soton.ac.uk/~srg/softwaretools/document/}
1301 }
1302 @MISC{Lovell:2011:updated,
1303   author =      {C. J. Lovell},
1304   title =       {Updated templates},
1305   year =        {2011}
1306 }
1307 @MISC{Gunn:2011:updated2,
1308   author =      {S.R. Gunn and C. J. Lovell},
1309   title =       {Updated templates reference 2},
1310   year =        {2011}
1311 }
1312 @MISC{attribpackage,
1313   author =      {Matt Swift},
1314   title =       {The attrib LaTeX package
1315 attribution of block elements (Frankenstein's hat)},
1316   year =        {1999},
1317   url =         {http://cs.brown.edu/about/system/managed/latex/doc/attrib.pdf}
1318 }
1319
1320 \</references>

```

### 9.4 Bibliography Style File

```

1321 \<{*bst}
1322 %% File: 'uos.bst'
1323 %% A modification of 'plainnat.bst' for use with natbib package
1324 %%
1325 %% Copyright 1993-1999 Patrick W Daly
1326 %% Max-Planck-Institut f\"ur Aeronomie
1327 %% Max-Planck-Str. 2
1328 %% D-37191 Katlenburg-Lindau
1329 %% Germany
1330 %% E-mail: daly@linmpi.mpg.de
1331 %%
1332 %% This program can be redistributed and/or modified under the terms
1333 %% of the LaTeX Project Public License Distributed from CTAN
1334 %% archives in directory macros/latex/base/lppl.txt; either
1335 %% version 1 of the License, or any later version.

```

```

1336 %%
1337 %% Includes field URL for Internet addresses
1338 %%
1339 ENTRY
1340 { address
1341     author
1342     booktitle
1343     chapter
1344     edition
1345     editor
1346     howpublished
1347     institution
1348     isbn
1349     issn
1350     journal
1351     key
1352     month
1353     note
1354     number
1355     organization
1356     pages
1357     publisher
1358     school
1359     series
1360     title
1361     type
1362     url
1363     volume
1364     year
1365 }
1366 {}
1367 { label extra.label sort.label short.list }
1368
1369 INTEGERS { output.state before.all mid.sentence after.sentence after.block }
1370
1371 FUNCTION {init.state.consts}
1372 { #0 'before.all :=
1373   #1 'mid.sentence :=
1374   #2 'after.sentence :=
1375   #3 'after.block :=
1376 }
1377
1378 STRINGS { s t }
1379
1380 FUNCTION {output.nonnull}
1381 { 's :=
1382   output.state mid.sentence =
1383     { ", " * write$ }
1384     { output.state after.block =
1385       { add.period$ write$
1386         newline$
1387         "\newblock " write$
1388       }
1389       { output.state before.all =

```



```

1390         'write$
1391         { add.period$ " " * write$ }
1392     if$
1393     }
1394     if$
1395     mid.sentence 'output.state :=
1396     }
1397 if$
1398 s
1399 }
1400
1401 FUNCTION {output}
1402 { duplicate$ empty$
1403     'pop$
1404     'output.nonnull
1405     if$
1406 }
1407
1408 FUNCTION {output.check}
1409 { 't :=
1410     duplicate$ empty$
1411     { pop$ "empty " t * " in " * cite$ * warning$ }
1412     'output.nonnull
1413     if$
1414 }
1415
1416 FUNCTION {fin.entry}
1417 { add.period$
1418     write$
1419     newline$
1420 }
1421
1422 FUNCTION {new.block}
1423 { output.state before.all =
1424     'skip$
1425     { after.block 'output.state := }
1426     if$
1427 }
1428
1429 FUNCTION {new.sentence}
1430 { output.state after.block =
1431     'skip$
1432     { output.state before.all =
1433         'skip$
1434         { after.sentence 'output.state := }
1435         if$
1436     }
1437     if$
1438 }
1439
1440 FUNCTION {not}
1441 { { #0 }
1442     { #1 }
1443     if$

```

```

1444 }
1445
1446 FUNCTION {and}
1447 {   'skip$
1448     { pop$ #0 }
1449   if$
1450 }
1451
1452 FUNCTION {or}
1453 {   { pop$ #1 }
1454     'skip$
1455   if$
1456 }
1457
1458 FUNCTION {new.block.checka}
1459 { empty$
1460   'skip$
1461   'new.block
1462   if$
1463 }
1464
1465 FUNCTION {new.block.checkb}
1466 { empty$
1467   swap$ empty$
1468   and
1469   'skip$
1470   'new.block
1471   if$
1472 }
1473
1474 FUNCTION {new.sentence.checka}
1475 { empty$
1476   'skip$
1477   'new.sentence
1478   if$
1479 }
1480
1481 FUNCTION {new.sentence.checkb}
1482 { empty$
1483   swap$ empty$
1484   and
1485   'skip$
1486   'new.sentence
1487   if$
1488 }
1489
1490 FUNCTION {field.or.null}
1491 { duplicate$ empty$
1492   { pop$ "" }
1493   'skip$
1494   if$
1495 }
1496
1497 FUNCTION {emphasize}

```

```

1498 { duplicate$ empty$
1499     { pop$ "" }
1500     { "{\em " swap$ * "}" * }
1501     if$
1502 }
1503
1504 INTEGERS { nameptr namesleft numnames }
1505
1506 FUNCTION {format.names}
1507 { 's :=
1508   #1 'nameptr :=
1509   s num.names$ 'numnames :=
1510   numnames 'namesleft :=
1511   { namesleft #0 > }
1512   { s nameptr "{ff~}{vv~}{ll}{, jj}" format.name$ 't :=
1513     nameptr #1 >
1514     { namesleft #1 >
1515       { ", " * t * }
1516       { numnames #2 >
1517         { ", " * }
1518         'skip$
1519         if$
1520         t "others" =
1521           { " et~al." * }
1522           { " and " * t * }
1523         if$
1524       }
1525       if$
1526     }
1527     't
1528     if$
1529     nameptr #1 + 'nameptr :=
1530     namesleft #1 - 'namesleft :=
1531   }
1532   while$
1533 }
1534
1535 FUNCTION {format.key}
1536 { empty$
1537   { key field.or.null }
1538   { "" }
1539   if$
1540 }
1541
1542 FUNCTION {format.authors}
1543 { author empty$
1544   { "" }
1545   { author format.names }
1546   if$
1547 }
1548
1549 FUNCTION {format.editors}
1550 { editor empty$
1551   { "" }

```

```

1552     { editor format.names
1553         editor num.names$ #1 >
1554         { ", editors" * }
1555         { ", editor" * }
1556         if$
1557     }
1558 if$
1559 }
1560
1561 FUNCTION {format.isbn}
1562 { isbn empty$
1563     { "" }
1564     { new.block "ISBN " isbn * }
1565     if$
1566 }
1567
1568 FUNCTION {format.issn}
1569 { issn empty$
1570     { "" }
1571     { new.block "ISSN " issn * }
1572     if$
1573 }
1574
1575 %FUNCTION {format.url}
1576 %{ url empty$
1577 %     { "" }
1578 %     { new.block "URL \url{" url * "}" * }
1579 % if$
1580 %}
1581 %
1582 %FUNCTION {format.title}
1583 %{ title empty$
1584 %     { "" }
1585 %     { title "t" change.case$ }
1586 % if$
1587 %}
1588 FUNCTION {format.url}
1589 { ""
1590 }
1591
1592 FUNCTION {format.title}
1593 { title empty$
1594     { "" }
1595     { url empty$
1596         { title "t" change.case$ }
1597         { "\href{" url * "}" * title "t" change.case$ * "}" * }
1598         if$
1599     }
1600     if$
1601 }
1602
1603
1604 FUNCTION {format.full.names}
1605 { 's :=

```

```

1606 #1 'nameptr :=
1607 s num.names$ 'numnames :=
1608 numnames 'namesleft :=
1609 { namesleft #0 > }
1610 { s nameptr
1611   "{vv~}{ll}" format.name$ 't :=
1612   nameptr #1 >
1613   {
1614     namesleft #1 >
1615     { ", " * t * }
1616     {
1617       numnames #2 >
1618       { ", " * }
1619       'skip$
1620       if$
1621       t "others" =
1622       { " et~al." * }
1623       { " and " * t * }
1624       if$
1625     }
1626     if$
1627   }
1628   't
1629   if$
1630   nameptr #1 + 'nameptr :=
1631   namesleft #1 - 'namesleft :=
1632 }
1633 while$
1634 }
1635
1636 FUNCTION {author.editor.full}
1637 { author empty$
1638   { editor empty$
1639     { "" }
1640     { editor format.full.names }
1641     if$
1642   }
1643   { author format.full.names }
1644   if$
1645 }
1646
1647 FUNCTION {author.full}
1648 { author empty$
1649   { "" }
1650   { author format.full.names }
1651   if$
1652 }
1653
1654 FUNCTION {editor.full}
1655 { editor empty$
1656   { "" }
1657   { editor format.full.names }
1658   if$
1659 }

```

```

1660
1661 FUNCTION {make.full.names}
1662 { type$ "book" =
1663   type$ "inbook" =
1664   or
1665     'author.editor.full
1666     { type$ "proceedings" =
1667       'editor.full
1668       'author.full
1669       if$
1670     }
1671   if$
1672 }
1673
1674 FUNCTION {output.bibitem}
1675 { newline$
1676   "\bibitem[" write$
1677   label write$
1678   ")" make.full.names duplicate$ short.list =
1679     { pop$ }
1680     { * }
1681     if$
1682     "]" * write$
1683     cite$ write$
1684     "]" write$
1685     newline$
1686     ""
1687     before.all 'output.state :=
1688 }
1689
1690 FUNCTION {n.dashify}
1691 { 't :=
1692   ""
1693   { t empty$ not }
1694   { t #1 #1 substring$ "-" =
1695     { t #1 #2 substring$ "--" = not
1696       { "--" *
1697         t #2 global.max$ substring$ 't :=
1698       }
1699       { { t #1 #1 substring$ "-" = }
1700         { "-" *
1701           t #2 global.max$ substring$ 't :=
1702         }
1703       while$
1704     }
1705     if$
1706   }
1707   { t #1 #1 substring$ *
1708     t #2 global.max$ substring$ 't :=
1709   }
1710   if$
1711 }
1712 while$
1713 }

```

```

1714
1715 FUNCTION {format.date}
1716 { year duplicate$ empty$
1717   { "empty year in " cite$ * warning$
1718     pop$ "" }
1719   'skip$
1720   if$
1721   month empty$
1722     'skip$
1723     { month
1724       " " * swap$ *
1725     }
1726   if$
1727   extra.label *
1728 }
1729
1730 FUNCTION {format.btitle}
1731 { title emphasize
1732 }
1733
1734 FUNCTION {tie.or.space.connect}
1735 { duplicate$ text.length$ #3 <
1736   { "~" }
1737   { " " }
1738   if$
1739   swap$ * *
1740 }
1741
1742 FUNCTION {either.or.check}
1743 { empty$
1744   'pop$
1745   { "can't use both " swap$ * " fields in " * cite$ * warning$ }
1746   if$
1747 }
1748
1749 FUNCTION {format.bvolume}
1750 { volume empty$
1751   { "" }
1752   { "volume" volume tie.or.space.connect
1753     series empty$
1754     'skip$
1755     { " of " * series emphasize * }
1756     if$
1757     "volume and number" number either.or.check
1758   }
1759   if$
1760 }
1761
1762 FUNCTION {format.number.series}
1763 { volume empty$
1764   { number empty$
1765     { series field.or.null }
1766     { output.state mid.sentence =
1767       { "number" }

```

```

1768         { "Number" }
1769         if$
1770         number tie.or.space.connect
1771         series empty$
1772         { "there's a number but no series in " cite$ * warning$ }
1773         { " in " * series * }
1774         if$
1775     }
1776     if$
1777 }
1778 { "" }
1779 if$
1780 }
1781
1782 FUNCTION {format.edition}
1783 { edition empty$
1784     { "" }
1785     { output.state mid.sentence =
1786         { edition "l" change.case$ " edition" * }
1787         { edition "t" change.case$ " edition" * }
1788         if$
1789     }
1790     if$
1791 }
1792
1793 INTEGERS { multiresult }
1794
1795 FUNCTION {multi.page.check}
1796 { 't :=
1797     #0 'multiresult :=
1798     { multiresult not
1799         t empty$ not
1800         and
1801     }
1802     { t #1 #1 substring$
1803         duplicate$ "-" =
1804         swap$ duplicate$ "," =
1805         swap$ "+" =
1806         or or
1807         { #1 'multiresult := }
1808         { t #2 global.max$ substring$ 't := }
1809         if$
1810     }
1811     while$
1812     multiresult
1813 }
1814
1815 FUNCTION {format.pages}
1816 { pages empty$
1817     { "" }
1818     { pages multi.page.check
1819         { "pages" pages n.dashify tie.or.space.connect }
1820         { "page" pages tie.or.space.connect }
1821         if$

```



```

1822     }
1823     if$
1824 }
1825
1826 FUNCTION {format.vol.num.pages}
1827 { volume field.or.null
1828   number empty$
1829   'skip$
1830   { "\penalty0 (" number * ")" * *
1831     volume empty$
1832     { "there's a number but no volume in " cite$ * warning$ }
1833     'skip$
1834     if$
1835   }
1836   if$
1837   pages empty$
1838   'skip$
1839   { duplicate$ empty$
1840     { pop$ format.pages }
1841     { ":\penalty0 " * pages n.dashify * }
1842     if$
1843   }
1844   if$
1845 }
1846
1847 FUNCTION {format.chapter.pages}
1848 { chapter empty$
1849   'format.pages
1850   { type empty$
1851     { "chapter" }
1852     { type "1" change.case$ }
1853     if$
1854     chapter tie.or.space.connect
1855     pages empty$
1856     'skip$
1857     { ", " * format.pages * }
1858     if$
1859   }
1860   if$
1861 }
1862
1863 FUNCTION {format.in.ed.booktitle}
1864 { booktitle empty$
1865   { "" }
1866   { editor empty$
1867     { "In " booktitle emphasize * }
1868     { "In " format.editors * ", " * booktitle emphasize * }
1869     if$
1870   }
1871   if$
1872 }
1873
1874 FUNCTION {empty.misc.check}
1875 { author empty$ title empty$ howpublished empty$

```

```

1876 month empty$ year empty$ note empty$
1877 and and and and and
1878 key empty$ not and
1879 { "all relevant fields are empty in " cite$ * warning$ }
1880 'skip$
1881 if$
1882 }
1883
1884 FUNCTION {format.thesis.type}
1885 { type empty$
1886   'skip$
1887   { pop$
1888     type "t" change.case$
1889   }
1890   if$
1891 }
1892
1893 FUNCTION {format.tr.number}
1894 { type empty$
1895   { "Technical Report" }
1896   'type
1897   if$
1898   number empty$
1899   { "t" change.case$ }
1900   { number tie.or.space.connect }
1901   if$
1902 }
1903
1904 FUNCTION {format.article.crossref}
1905 { key empty$
1906   { journal empty$
1907     { "need key or journal for " cite$ * " to crossref " * crossref *
1908       warning$
1909       ""
1910     }
1911     { "In {\em " journal * "\/}" * }
1912     if$
1913   }
1914   { "In " key * }
1915   if$
1916   " \citep{" * crossref * "}" *
1917 }
1918
1919 FUNCTION {format.book.crossref}
1920 { volume empty$
1921   { "empty volume in " cite$ * "'s crossref of " * crossref * warning$
1922     "In "
1923   }
1924   { "Volume" volume tie.or.space.connect
1925     " of " *
1926   }
1927   if$
1928   editor empty$
1929   editor field.or.null author field.or.null =

```

```

1930 or
1931 { key empty$
1932   { series empty$
1933     { "need editor, key, or series for " cite$ * " to crossref " *
1934       crossref * warning$
1935       "" *
1936     }
1937     { "{\em " * series * "\/}" * }
1938   if$
1939   }
1940   { key * }
1941   if$
1942   }
1943   'skip$
1944   if$
1945   ", \citet{" * crossref * "}" *
1946 }
1947
1948 FUNCTION {format.incoll.inproc.crossref}
1949 { editor empty$
1950   editor field.or.null author field.or.null =
1951   or
1952   { key empty$
1953     { booktitle empty$
1954       { "need editor, key, or booktitle for " cite$ * " to crossref " *
1955         crossref * warning$
1956         ""
1957       }
1958       { "In {\em " booktitle * "\/}" * }
1959     if$
1960     }
1961     { "In " key * }
1962     if$
1963     }
1964     { "In " }
1965     if$
1966     " \citet{" * crossref * "}" *
1967 }
1968
1969 FUNCTION {article}
1970 { output.bibitem
1971   format.authors "author" output.check
1972   author format.key output
1973   new.block
1974   format.title "title" output.check
1975   new.block
1976   crossref missing$
1977   { journal emphasize "journal" output.check
1978     format.vol.num.pages output
1979     format.date "year" output.check
1980   }
1981   { format.article.crossref output.nonnull
1982     format.pages output
1983   }

```

```

1984 if$
1985 format.issn output
1986 format.url output
1987 new.block
1988 note output
1989 fin.entry
1990 }
1991
1992 FUNCTION {book}
1993 { output.bibitem
1994   author empty$
1995     { format.editors "author and editor" output.check
1996       editor format.key output
1997     }
1998     { format.authors output.nonnull
1999       crossref missing$
2000         { "author and editor" editor either.or.check }
2001         'skip$
2002       if$
2003     }
2004   if$
2005   new.block
2006   format.btitle "title" output.check
2007   crossref missing$
2008     { format.bvolume output
2009       new.block
2010       format.number.series output
2011       new.sentence
2012       publisher "publisher" output.check
2013       address output
2014     }
2015     { new.block
2016       format.book.crossref output.nonnull
2017     }
2018   if$
2019   format.edition output
2020   format.date "year" output.check
2021   format.isbn output
2022   format.url output
2023   new.block
2024   note output
2025   fin.entry
2026 }
2027
2028 FUNCTION {booklet}
2029 { output.bibitem
2030   format.authors output
2031   author format.key output
2032   new.block
2033   format.title "title" output.check
2034   howpublished address new.block.checkb
2035   howpublished output
2036   address output
2037   format.date output

```

```

2038 format.isbn output
2039 format.url output
2040 new.block
2041 note output
2042 fin.entry
2043 }
2044
2045 FUNCTION {inbook}
2046 { output.bibitem
2047   author empty$
2048     { format.editors "author and editor" output.check
2049       editor format.key output
2050     }
2051     { format.authors output.nonnull
2052       crossref missing$
2053         { "author and editor" editor either.or.check }
2054         'skip$
2055       if$
2056     }
2057   if$
2058   new.block
2059   format.btitle "title" output.check
2060   crossref missing$
2061     { format.bvolume output
2062       format.chapter.pages "chapter and pages" output.check
2063       new.block
2064       format.number.series output
2065       new.sentence
2066       publisher "publisher" output.check
2067       address output
2068     }
2069     { format.chapter.pages "chapter and pages" output.check
2070       new.block
2071       format.book.crossref output.nonnull
2072     }
2073   if$
2074   format.edition output
2075   format.date "year" output.check
2076   format.isbn output
2077   format.url output
2078   new.block
2079   note output
2080   fin.entry
2081 }
2082
2083 FUNCTION {incollection}
2084 { output.bibitem
2085   format.authors "author" output.check
2086   author format.key output
2087   new.block
2088   format.title "title" output.check
2089   new.block
2090   crossref missing$
2091     { format.in.ed.booktitle "booktitle" output.check

```

```

2092     format.bvolume output
2093     format.number.series output
2094     format.chapter.pages output
2095     new.sentence
2096     publisher "publisher" output.check
2097     address output
2098     format.edition output
2099     format.date "year" output.check
2100 }
2101 { format.incoll.inproc.crossref output.nonnull
2102     format.chapter.pages output
2103 }
2104 if$
2105     format.isbn output
2106     format.url output
2107     new.block
2108     note output
2109     fin.entry
2110 }
2111
2112 FUNCTION {inproceedings}
2113 { output.bibitem
2114     format.authors "author" output.check
2115     author format.key output
2116     new.block
2117     format.title "title" output.check
2118     new.block
2119     crossref missing$
2120     { format.in.ed.booktitle "booktitle" output.check
2121         format.bvolume output
2122         format.number.series output
2123         format.pages output
2124         address empty$
2125         { organization publisher new.sentence.checkb
2126             organization output
2127             publisher output
2128             format.date "year" output.check
2129         }
2130         { address output.nonnull
2131             format.date "year" output.check
2132             new.sentence
2133             organization output
2134             publisher output
2135         }
2136     } if$
2137 }
2138 { format.incoll.inproc.crossref output.nonnull
2139     format.pages output
2140 }
2141 if$
2142     format.isbn output
2143     format.url output
2144     new.block
2145     note output

```

```

2146   fin.entry
2147 }
2148
2149 FUNCTION {conference} { inproceedings }
2150
2151 FUNCTION {manual}
2152 { output.bibitem
2153   format.authors output
2154   author format.key output
2155   new.block
2156   format.btitle "title" output.check
2157   organization address new.block.checkb
2158   organization output
2159   address output
2160   format.edition output
2161   format.date output
2162   format.url output
2163   new.block
2164   note output
2165   fin.entry
2166 }
2167
2168 FUNCTION {mastersthesis}
2169 { output.bibitem
2170   format.authors "author" output.check
2171   author format.key output
2172   new.block
2173   format.title "title" output.check
2174   new.block
2175   "Master's thesis" format.thesis.type output.nonnull
2176   school "school" output.check
2177   address output
2178   format.date "year" output.check
2179   format.url output
2180   new.block
2181   note output
2182   fin.entry
2183 }
2184
2185 FUNCTION {misc}
2186 { output.bibitem
2187   format.authors output
2188   author format.key output
2189   title howpublished new.block.checkb
2190   format.title output
2191   howpublished new.block.checka
2192   howpublished output
2193   format.date output
2194   format.issn output
2195   format.url output
2196   new.block
2197   note output
2198   fin.entry
2199   empty.misc.check

```

```

2200 }
2201
2202 FUNCTION {phdthesis}
2203 { output.bibitem
2204   format.authors "author" output.check
2205   author format.key output
2206   new.block
2207   format.btitle "title" output.check
2208   new.block
2209   "PhD thesis" format.thesis.type output.nonnull
2210   school "school" output.check
2211   address output
2212   format.date "year" output.check
2213   format.url output
2214   new.block
2215   note output
2216   fin.entry
2217 }
2218
2219 FUNCTION {proceedings}
2220 { output.bibitem
2221   format.editors output
2222   editor format.key output
2223   new.block
2224   format.btitle "title" output.check
2225   format.bvolume output
2226   format.number.series output
2227   address output
2228   format.date "year" output.check
2229   new.sentence
2230   organization output
2231   publisher output
2232   format.isbn output
2233   format.url output
2234   new.block
2235   note output
2236   fin.entry
2237 }
2238
2239 FUNCTION {techreport}
2240 { output.bibitem
2241   format.authors "author" output.check
2242   author format.key output
2243   new.block
2244   format.title "title" output.check
2245   new.block
2246   format.tr.number output.nonnull
2247   institution "institution" output.check
2248   address output
2249   format.date "year" output.check
2250   format.url output
2251   new.block
2252   note output
2253   fin.entry

```



```

2254 }
2255
2256 FUNCTION {unpublished}
2257 { output.bibitem
2258   format.authors "author" output.check
2259   author format.key output
2260   new.block
2261   format.title "title" output.check
2262   format.url output
2263   new.block
2264   note "note" output.check
2265   format.date output
2266   fin.entry
2267 }
2268
2269 FUNCTION {default.type} { misc }
2270
2271
2272 MACRO {jan} {"January"}
2273
2274 MACRO {feb} {"February"}
2275
2276 MACRO {mar} {"March"}
2277
2278 MACRO {apr} {"April"}
2279
2280 MACRO {may} {"May"}
2281
2282 MACRO {jun} {"June"}
2283
2284 MACRO {jul} {"July"}
2285
2286 MACRO {aug} {"August"}
2287
2288 MACRO {sep} {"September"}
2289
2290 MACRO {oct} {"October"}
2291
2292 MACRO {nov} {"November"}
2293
2294 MACRO {dec} {"December"}
2295
2296
2297
2298 MACRO {acmcs} {"ACM Computing Surveys"}
2299
2300 MACRO {acta} {"Acta Informatica"}
2301
2302 MACRO {cacm} {"Communications of the ACM"}
2303
2304 MACRO {ibmjrd} {"IBM Journal of Research and Development"}
2305
2306 MACRO {ibmsj} {"IBM Systems Journal"}
2307

```

```

2308 MACRO {ieeese} {"IEEE Transactions on Software Engineering"}
2309
2310 MACRO {ieeetc} {"IEEE Transactions on Computers"}
2311
2312 MACRO {ieeetcad}
2313 {"IEEE Transactions on Computer-Aided Design of Integrated Circuits"}
2314
2315 MACRO {ipl} {"Information Processing Letters"}
2316
2317 MACRO {jacm} {"Journal of the ACM"}
2318
2319 MACRO {jcass} {"Journal of Computer and System Sciences"}
2320
2321 MACRO {scp} {"Science of Computer Programming"}
2322
2323 MACRO {sicomp} {"SIAM Journal on Computing"}
2324
2325 MACRO {tocs} {"ACM Transactions on Computer Systems"}
2326
2327 MACRO {tods} {"ACM Transactions on Database Systems"}
2328
2329 MACRO {tog} {"ACM Transactions on Graphics"}
2330
2331 MACRO {toms} {"ACM Transactions on Mathematical Software"}
2332
2333 MACRO {toois} {"ACM Transactions on Office Information Systems"}
2334
2335 MACRO {toplas} {"ACM Transactions on Programming Languages and Systems"}
2336
2337 MACRO {tcs} {"Theoretical Computer Science"}
2338
2339
2340 READ
2341
2342 FUNCTION {sortify}
2343 {
2344   's :=
2345   "l" change.case$
2346 }
2347
2348
2349 FUNCTION {chop.word}
2350 {
2351   's :=
2352   'len :=
2353   s #1 len substring$ =
2354   { s len #1 + global.max$ substring$ }
2355   's
2356   if$
2357 }
2358
2359 FUNCTION {format.lab.names}
2360 {
2361   's :=
2362   s #1 "{vv~}{ll}" format.name$
2363   s num.names$ duplicate$

```

```

2362 #2 >
2363 { pop$ " et~al." * }
2364 { #2 <
2365   'skip$
2366   { s #2 "{ff }{vv }{ll}{ jj}" format.name$ "others" =
2367     { " et~al." * }
2368     { " and " * s #2 "{vv~}{ll}" format.name$ * }
2369   if$
2370   }
2371   if$
2372   }
2373 if$
2374 }
2375
2376 FUNCTION {author.key.label}
2377 { author empty$
2378   { key empty$
2379     { cite$ #1 #3 substring$ }
2380     'key
2381     if$
2382   }
2383   { author format.lab.names }
2384   if$
2385 }
2386
2387 FUNCTION {author.editor.key.label}
2388 { author empty$
2389   { editor empty$
2390     { key empty$
2391       { cite$ #1 #3 substring$ }
2392       'key
2393       if$
2394     }
2395     { editor format.lab.names }
2396     if$
2397   }
2398   { author format.lab.names }
2399   if$
2400 }
2401
2402 FUNCTION {author.key.organization.label}
2403 { author empty$
2404   { key empty$
2405     { organization empty$
2406       { cite$ #1 #3 substring$ }
2407       { "The " #4 organization chop.word #3 text.prefix$ }
2408       if$
2409     }
2410     'key
2411     if$
2412   }
2413   { author format.lab.names }
2414   if$
2415 }

```

```

2416
2417 FUNCTION {editor.key.organization.label}
2418 { editor empty$
2419   { key empty$
2420     { organization empty$
2421       { cite$ #1 #3 substring$ }
2422       { "The " #4 organization chop.word #3 text.prefix$ }
2423       if$
2424     }
2425     'key
2426     if$
2427   }
2428   { editor format.lab.names }
2429   if$
2430 }
2431
2432 FUNCTION {calc.short.authors}
2433 { type$ "book" =
2434   type$ "inbook" =
2435   or
2436   'author.editor.key.label
2437   { type$ "proceedings" =
2438     'editor.key.organization.label
2439     { type$ "manual" =
2440       'author.key.organization.label
2441       'author.key.label
2442       if$
2443     }
2444     if$
2445   }
2446   if$
2447   'short.list :=
2448 }
2449
2450 FUNCTION {calc.label}
2451 { calc.short.authors
2452   short.list
2453   "("
2454   *
2455   year duplicate$ empty$
2456   short.list key field.or.null = or
2457   { pop$ "" }
2458   'skip$
2459   if$
2460   *
2461   'label :=
2462 }
2463
2464 FUNCTION {sort.format.names}
2465 { 's :=
2466   #1 'nameptr :=
2467   ""
2468   s num.names$ 'numnames :=
2469   numnames 'namesleft :=

```

```

2470 { namesleft #0 > }
2471 { nameptr #1 >
2472   { " " * }
2473   'skip$
2474   if$
2475   s nameptr "{vv{ } }{ll{ }}{ ff{ }}{ jj{ }}" format.name$ 't :=
2476   nameptr numnames = t "others" = and
2477   { "et al" * }
2478   { t sortify * }
2479   if$
2480   nameptr #1 + 'nameptr :=
2481   namesleft #1 - 'namesleft :=
2482 }
2483 while$
2484 }
2485
2486 FUNCTION {sort.format.title}
2487 { 't :=
2488   "A " #2
2489   "An " #3
2490   "The " #4 t chop.word
2491   chop.word
2492   chop.word
2493   sortify
2494   #1 global.max$ substring$
2495 }
2496
2497 FUNCTION {author.sort}
2498 { author empty$
2499   { key empty$
2500     { "to sort, need author or key in " cite$ * warning$
2501       ""
2502     }
2503     { key sortify }
2504     if$
2505   }
2506   { author sort.format.names }
2507   if$
2508 }
2509
2510 FUNCTION {author.editor.sort}
2511 { author empty$
2512   { editor empty$
2513     { key empty$
2514       { "to sort, need author, editor, or key in " cite$ * warning$
2515         ""
2516       }
2517       { key sortify }
2518       if$
2519     }
2520     { editor sort.format.names }
2521     if$
2522   }
2523   { author sort.format.names }

```

```

2524 if$
2525 }
2526
2527 FUNCTION {author.organization.sort}
2528 { author empty$
2529   { organization empty$
2530     { key empty$
2531       { "to sort, need author, organization, or key in " cite$ * warning$
2532         ""
2533       }
2534       { key sortify }
2535     if$
2536   }
2537   { "The " #4 organization chop.word sortify }
2538   if$
2539 }
2540 { author sort.format.names }
2541 if$
2542 }
2543
2544 FUNCTION {editor.organization.sort}
2545 { editor empty$
2546   { organization empty$
2547     { key empty$
2548       { "to sort, need editor, organization, or key in " cite$ * warning$
2549         ""
2550       }
2551       { key sortify }
2552     if$
2553   }
2554   { "The " #4 organization chop.word sortify }
2555   if$
2556 }
2557 { editor sort.format.names }
2558 if$
2559 }
2560
2561 FUNCTION {presort}
2562 { calc.label
2563   label sortify
2564   " "
2565   *
2566   type$ "book" =
2567   type$ "inbook" =
2568   or
2569   'author.editor.sort
2570   { type$ "proceedings" =
2571     'editor.organization.sort
2572     { type$ "manual" =
2573       'author.organization.sort
2574       'author.sort
2575     if$
2576   }
2577   if$

```

```

2578     }
2579     if$
2580     "      "
2581     *
2582     year field.or.null sortify
2583     *
2584     "      "
2585     *
2586     title field.or.null
2587     sort.format.title
2588     *
2589     #1 entry.max$ substring$
2590     'sort.label :=
2591     sort.label *
2592     #1 entry.max$ substring$
2593     'sort.key$ :=
2594 }
2595
2596 ITERATE {presort}
2597
2598 SORT
2599
2600 STRINGS { longest.label last.label next.extra }
2601
2602 INTEGERS { longest.label.width last.extra.num number.label }
2603
2604 FUNCTION {initialize.longest.label}
2605 { "" 'longest.label :=
2606   #0 int.to.chr$ 'last.label :=
2607   "" 'next.extra :=
2608   #0 'longest.label.width :=
2609   #0 'last.extra.num :=
2610   #0 'number.label :=
2611 }
2612
2613 FUNCTION {forward.pass}
2614 { last.label label =
2615   { last.extra.num #1 + 'last.extra.num :=
2616     last.extra.num int.to.chr$ 'extra.label :=
2617   }
2618   { "a" chr.to.int$ 'last.extra.num :=
2619     "" 'extra.label :=
2620     label 'last.label :=
2621   }
2622   if$
2623   number.label #1 + 'number.label :=
2624 }
2625
2626 FUNCTION {reverse.pass}
2627 { next.extra "b" =
2628   { "a" 'extra.label := }
2629   'skip$
2630   if$
2631   extra.label 'next.extra :=

```

```

2632 extra.label
2633 duplicate$ empty$
2634 'skip$
2635 { "{\natexlab{" swap$ * "}}" * }
2636 if$
2637 'extra.label :=
2638 label extra.label * 'label :=
2639 }
2640
2641 EXECUTE {initialize.longest.label}
2642
2643 ITERATE {forward.pass}
2644
2645 REVERSE {reverse.pass}
2646
2647 FUNCTION {bib.sort.order}
2648 { sort.label 'sort.key$ :=
2649 }
2650
2651 ITERATE {bib.sort.order}
2652
2653 SORT
2654
2655 FUNCTION {begin.bib}
2656 { preamble$ empty$
2657 'skip$
2658 { preamble$ write$ newline$ }
2659 if$
2660 "\begin{thebibliography}" number.label int.to.str$ * "}" *
2661 write$ newline$
2662 "\expandafter\ifx\csname natexlab\endcsname\relax\def\natexlab#1{#1}\fi"
2663 write$ newline$
2664 "\expandafter\ifx\csname url\endcsname\relax" write$ newline$
2665 " \def\url#1{{\tt #1}}\fi" write$ newline$
2666 }
2667
2668 EXECUTE {begin.bib}
2669
2670 EXECUTE {init.state.consts}
2671
2672 ITERATE {call.type$}
2673
2674 FUNCTION {end.bib}
2675 { newline$
2676 "\end{thebibliography}" write$ newline$
2677 }
2678
2679 EXECUTE {end.bib}
2680 </bst>

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