LaTeX 2ε 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 Deparment 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 LaTeX 2ε 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 copyright 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 `uosthesis` document class
minithesis	produce the `uosminithesis` document class
progress	produce the `uosprogress` document class
project	produce the `uosproject` document class
report	produce the `uosreport` document class
article	produce the `uosarticle` document class
gdp	produce the `uosgdp` document class
gdpsummary	produce the `uosgdpsummary` 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}
```

```
\DeclareOption{sotoncolour}{
\definecolor{sotonMarineBlue}{RGB}{1,67,89} % Soton marine blue (P 7469C)
  \definecolor{sotonGrey}{RGB}{153,153,166} % Soton grey (P 443C)
  \definecolor{sotonRed}{RGB}{171,18,16} % Soton Red (P 484C)
  \colorlet{linkBlue}{sotonMarineBlue}
  \colorlet{custGray}{sotonGrey}
  \colorlet{chapRed}{sotonRed}
}
\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.

```
\def\@checkoptions#1#2{
  \edef\@curroptions{\@ptionlist{\@currname.\@currext}}
  \@tempswafalse
  \@tfor\@this:=#2\do{
    \@expandtwoargs\in@{,\@this,}{,\@curroptions,}
    \ifin@ \@tempswatrue \@break@tfor \fi}
  \let\@this\@empty
  \if@tempswa \else \PassOptionsToClass{#1}{\baseclass}\fi
}
```

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

```
⟨*thesis | minithesis | progress | report | article | gdp | gdpsummary⟩
\@checkoptions{11pt}{{10pt}{11pt}{12pt}}
⟨/thesis | minithesis | progress | report | article | gdp | gdpsummary⟩
⟨*project⟩
\@checkoptions{12pt}{{10pt}{11pt}{12pt}}
⟨/project⟩
\PassOptionsToClass{a4paper}{\baseclass}
\ProcessOptions\relax
```

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

```
\LoadClass{\baseclass}
```

4.1 Banner

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

```
\newcommand\bhrule{\typeout{----------------------------------------------------------------------
\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.

```
⟨*thesis⟩
\def\today{\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
  \space \number\year}
⟨/thesis⟩
```

5 Document Layout

5.1 Font

```
%% \usepackage[T1]{fontspec}
%    Set font for copyright statement body text
\usepackage[defaultsans]{droidsans}
%    Set a particular style of font for the thesis. A font that has smallcaps
\usepackage{mathpazo}
%%\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.

```
\usepackage{setspace}
⟨thesis | minithesis | progress | project | report | gdp | gdpsummary⟩\onehalfspacing
⟨article⟩\singlespacing
\setlength{\parindent}{0pt}
\setlength{\parskip}{2.0ex plus0.5ex minus0.2ex}
```

5.3 Margins

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

```
\usepackage{vmargin}
⟨*thesis | minithesis | progress | project | report | gdp | gdpsummary⟩
\setmarginsrb           { 1.5in}  % left margin
                        { 0.6in}  % top margin
                        { 1.0in}  % right margin
                        { 0.8in}  % bottom margin
                        {  20pt}  % head height
                        {0.25in}  % head sep
                        {   9pt}  % foot height
                        { 0.3in}  % foot sep
⟨/thesis | minithesis | progress | project | report | gdp | gdpsummary⟩
⟨*article⟩
\setmarginsrb           { 0.8in}  % left margin
                        { 0.6in}  % top margin
                        { 0.8in}  % right margin
                        { 0.8in}  % bottom margin
                        {  20pt}  % head height
```

```
                        {0.25in}  % head sep
                        {   9pt}  % foot height
                        { 0.3in}  % foot sep
⟨/article⟩
```

5.4 Breaks

Control how pages and lines are broken.

```
\raggedbottom
\setlength{\topskip}{1\topskip \@plus 5\p@}
\doublehyphendemerits=10000       % No consecutive line hyphens.
\brokenpenalty=10000              % No broken words across columns/pages.
\widowpenalty=9999                % Almost no widows at bottom of page.
\clubpenalty=9999                 % Almost no orphans at top of page.
\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.

```
\usepackage{fancyhdr}
% Help from https://texblog.org/2007/11/07/headerfooter-in-latex-with-fancyhdr/#comment-4783
\fancyhead[LE]{\textrm\thepage}
\fancyhead[LO]{\fancyplain{}{\textsl{\rightmark}}}
\fancyhead[RE]{\fancyplain{}{\textsl{\leftmark}}}
\fancyhead[RO]{\textrm\thepage}
\chead{}\lfoot{}\rfoot{}\cfoot{}
\pagestyle{fancy}
\fancypagestyle{plain}{
  \fancyhf{}
  \fancyhead[OR]{\thepage}
  \renewcommand{\headrulewidth}{0pt}
}
```

`\chaptermark` `\sectionmark` `\subsectionmark`

Redefine `chaptermark` and `sectionmark` to set up the correct header name and produce a banner on the output making the location of messages simpler.

The \btypeout command is for console logging where chapters start \chapapp expands to "Chapter" or "Appendix"

```
⟨∗thesis | minithesis | progress | project | report | gdp⟩
\renewcommand{\chaptermark}[1]{\btypeout{\thechapter.\space #1}\markboth{\chaptername\ \thecha
\renewcommand{\sectionmark}[1]{\markright{\thesection.\hspace{1em}#1}}
\renewcommand{\subsectionmark}[1]{}
⟨/thesis | minithesis | progress | project | report | gdp⟩
⟨∗article⟩
\renewcommand{\sectionmark}[1]{\btypeout{\thesection\hspace{1em}}\markboth{}{\thesection.\hspa
\renewcommand{\subsectionmark}[1]{}
\renewcommand{\subsubsectionmark}[1]{}
⟨/article⟩
⟨gdpsummary⟩\markboth{GDP Summary Report}{GDP Summary Report}
```

`\cleardoublepage`

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

```
\def\cleardoublepage{\clearpage\if@twoside \ifodd\c@page\else
\hbox{}
\thispagestyle{empty}
\newpage
\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.

```
\def\cleartoeven{\clearpage\if@twoside \ifodd\c@page
\hbox{}
\thispagestyle{empty}
\newpage
\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.

```
%% -------------------- Figure/Table/Eq/Listing Stying --------------------
%% Set the styling for non text elements of the document
\usepackage{amsmath,amsfonts,amssymb,amscd,amsthm,xspace}
\theoremstyle{plain}
⟨*thesis | minithesis | progress | project | report | gdp⟩
\newtheorem{example}{Example}[chapter]
\newtheorem{theorem}{Theorem}[chapter]
⟨/thesis | minithesis | progress | project | report | gdp⟩
⟨*article | gdpsummary⟩
\newtheorem{example}{Example}[section]
\newtheorem{theorem}{Theorem}[section]
⟨/article | gdpsummary⟩
\newtheorem{corollary}[theorem]{Corollary}
\newtheorem{lemma}[theorem]{Lemma}
\newtheorem{proposition}[theorem]{Proposition}
\newtheorem{axiom}[theorem]{Axiom}
\theoremstyle{definition}
\newtheorem{definition}[theorem]{Definition}
\theoremstyle{remark}
\newtheorem{remark}[theorem]{Remark}
```

5.7 Captions

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

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

5.8 Float Placement

`\topfraction` `\textfraction`

Preventing figures from appearing on a page by themselves. LaTeX'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 LaTeX 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%.

```
\renewcommand{\topfraction}{0.85}
\renewcommand{\bottomfraction}{.85}
\renewcommand{\textfraction}{0.1}
\renewcommand{\dbltopfraction}{.85}
```

`\floatpagefraction`

This helps, but sometimes LaTeX 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. LaTeX 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%.

```
\renewcommand{\floatpagefraction}{0.75}
\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.

```
\setcounter{topnumber}{9}
\setcounter{bottomnumber}{9}
\setcounter{totalnumber}{20}
\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 pdfLaTeX 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`.

```
\usepackage{graphicx}
\usepackage{epstopdf}
```

5.10 Subfigures and subtables

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

```
\usepackage[]{subcaption}
\usepackage{booktabs}
\usepackage{rotating}
```

5.11 Listings

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

```
\usepackage{listings}
% %\usepackage{lstpatch}
\lstset{captionpos=b,
        frame=tb,
        basicstyle=\scriptsize\ttfamily,
        showstringspaces=false,
        keepspaces=true}
\lstdefinestyle{matlab} {
        language=Matlab,
        keywordstyle=\color{blue},
        commentstyle=\color[rgb]{0.13,0.55,0.13}\em,
        stringstyle=\color[rgb]{0.7,0,0} }
```

5.12 Hyperlinks

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

```
\usepackage[pdfpagemode={UseOutlines},bookmarks=true,bookmarksopen=true,
   bookmarksopenlevel=0,bookmarksnumbered=true,hypertexnames=false,
   colorlinks,linkcolor={linkBlue},citecolor={linkBlue},urlcolor={linkBlue},
   pdfstartview={FitV},unicode,breaklinks=true]{hyperref}
\pdfstringdefDisableCommands{
   \let\\\space
}
```

6 Internal Names

\supervisor
\examiner
\degree
\authors
\addresses
\university
\UNIVERSITY
\department
\DEPARTMENT
\group
\GROUP
\faculty
\FACULTY
\subject
\keywords

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.

The examiner and supervisor commands can be puralised so that it can print "Supervisors:". This is with an optional argument. [s] which will add and "s" to the word "Supervisor"

```
%% --------------------- Organisational Structure ----------------------
\newcommand*{\supervisor}[2][]{\def\supname{#2}\def\supplural{#1}}
\newcommand*{\examiner}[2][]{\def\examname{#2}\def\examplural{#1}}
\newcommand*{\degree}[1]{\def\degreename{#1}}
\newcommand*{\authors}[1]{\def\authornames{#1}}
\newcommand*{\qualifications}[1]{\def\quals{#1}}
\newcommand*{\addresses}[1]{\def\addressnames{#1}}
\newcommand*{\doi}[1]{\def\doicode{#1}}
\newcommand*{\volume}[2]{\def\volno{#1}\def\volof{#2}}
\newcommand*{\orcidid}[1]{\def\orcid{#1}}
\newcommand*{\university}[1]{\def\univname{#1}}
\newcommand*{\UNIVERSITY}[1]{\def\UNIVNAME{#1}}
\newcommand*{\department}[1]{\def\deptname{#1}}
\newcommand*{\DEPARTMENT}[1]{\def\DEPTNAME{#1}}
\newcommand*{\group}[1]{\def\groupname{#1}}
\newcommand*{\GROUP}[1]{\def\GROUPNAME{#1}}
```

```
\newcommand*{\faculty}[1]{\def\facname{#1}}
\newcommand*{\FACULTY}[1]{\def\FACNAME{#1}}
\newcommand*{\subject}[1]{\def\subjectname{#1}}
\newcommand*{\keywords}[1]{\def\keywordnames{#1}}
```

\supname
\examname
\degreename
\authornames
\univname
\UNIVNAME
\deptname
\DEPTNAME
\groupname
\GROUPNAME
\facname
\FACNAME
\subjectname
\keywordnames

The internal names of the elements are set to defaults appropriate to the Department of Electronics and Computer Science.

By running these commands at the top of your tex file it will overwrite the defaults.

```
%% -------------------- Organisational Structure ---------------------
\doi{}
\supervisor  {}
\examiner    {}
\degree      {}
\authors     {}
\qualifications{}
\orcidid{}
\volume{}{}
\university  {\texorpdfstring{\href{http://www.southampton.ac.uk}
                {University of Southampton}}
                {University of Southampton}}
\UNIVERSITY  {\MakeUppercase{\univname}}
\department  {School of Electronics and Computer Science}
\DEPARTMENT  {\MakeUppercase{\deptname}}
\group       {Cyber Physical Systems Group}
\GROUP       {\MakeUppercase{\groupname}}
\faculty     {Faculty of Engineering and Physical Science}
\FACULTY     {\MakeUppercase{\facname}}
\addresses   {}
\subject     {}
\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

```
⟨*thesis | minithesis | progress | project | report | gdp | gdpsummary⟩
%    Start by Adding meta data to the produced document
\usepackage{titling}
\AtBeginDocument{
  \hypersetup{pdftitle={\thetitle}}
  \hypersetup{pdfsubject={\subjectname}}
  \hypersetup{pdfauthor={\authornames}}
  \hypersetup{pdfkeywords={\keywordnames}}
}
```

```
%    Define the title page layout
\renewcommand\maketitle{
  \btypeout{Title Page}
  \thispagestyle{empty}
  \begin{titlepage}
    \let\footnotesize\small
    \let\footnoterule\relax
    \let \footnote \thanks
    \setcounter{footnote}{0}
    \null\vfil
    \vskip 60\p@
    \begin{center}
      \setlength{\parskip}{0pt}
      {\scshape\LARGE\textbf{\univname}\par}
      %% TODO: Change all the descriptions to italic like the Thesis one
⟨∗thesis | minithesis | progress | project | gdp | gdpsummary⟩
      \bigskip
      {\large \facname \par}
⟨/thesis | minithesis | progress | project | gdp | gdpsummary⟩
⟨∗thesis | minithesis | progress | project⟩
      {\large \deptname \par}
⟨/thesis | minithesis | progress | project⟩
      \vfill
⟨∗minithesis⟩
      {\large A mini-thesis submitted for transfer from}
      {\large MPhil to PhD \par}
⟨/minithesis⟩
⟨∗progress⟩
      {\large A progress report submitted for continuation}
      {\large towards a PhD \par}
⟨/progress⟩
⟨∗project⟩
      {\large A project report submitted for the}
      {\large award of \par \degreename \par}
⟨/project⟩
⟨∗gdp⟩
      {\large A group design project report submitted for}
      {\large the award of \par \degreename \par}
⟨/gdp⟩
⟨∗gdpsummary⟩
      {\large A group design project summary report submitted}
      {\large for the award of \par \degreename \par}
⟨/gdpsummary⟩
⟨∗minithesis | progress | project | gdp | gdpsummary⟩
      \vfill
      {\normalsize Supervisor\supplural: \supname \par}
      {\normalsize Examiner\examplural: \examname \par}
      \vfill
      \hspace{6mm}\parbox[t][51mm][s]{89mm}{
        \center
        \vfill
        {\large \bf \@title \par}
        \vfill
        {\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
```

```
  \global\let\@thanks\@empty
  \global\let\@author\@empty
  \global\let\@date\@empty
  \global\let\title\relax
  \global\let\author\relax
  \global\let\date\relax
  \global\let\and\relax
  \cleardoublepage
}
```
⟨/thesis | minithesis | progress | project | report | gdp | gdpsummary⟩
⟨∗article⟩
```
\if@titlepage
  \renewcommand\maketitle{
    \btypeout{Title Page}
    \markboth{\authornames}{\@title}
    \begin{titlepage}
    \thispagestyle{empty}
    \let\footnotesize\small
    \let\footnoterule\relax
    \let \footnote \thanks
    \null\vfil
    \vskip 60\p@
    \begin{center}
      {\LARGE \@title \par}
      \vskip 3em
      {\large \lineskip .75em
        \begin{tabular}[t]{c} \authornames \end{tabular}
      \par}
      \vskip 1em
      {\large \lineskip .5em
        \begin{tabular}[t]{c} \addressnames \end{tabular}
      \par}
      \vskip 1.5em
      {\large \@date \par}
      \if\keywordnames
      \else
        \quotation
        \vskip 1.5em
        {\noindent \normalsize
            \textbf{Keywords:}
            \textit{\keywordnames}
        \par}
        \endquotation
      \fi
    \end{center}
    \par
    \@thanks
    \vfil\null
    \end{titlepage}
    \setcounter{footnote}{0}
    \global\let\thanks\relax
    \global\let\maketitle\relax
    \global\let\@maketitle\relax
    \global\let\@thanks\@empty
```

```
    \global\let\@author\@empty
    \global\let\@date\@empty
    \global\let\title\relax
    \global\let\author\relax
    \global\let\date\relax
    \global\let\and\relax
  }
\else
  \renewcommand\maketitle{
    \btypeout{Title Page}
    \markboth{\authornames}{\@title}
    \thispagestyle{empty}
    \par
    \begingroup
      \renewcommand\thefootnote{\@fnsymbol\c@footnote}
      \def\@makefnmark{
        \rlap{\@textsuperscript{\normalfont\@thefnmark}}
      }
      \long\def\@makefntext##1{
        \parindent 1em\noindent \hb@xt@1.8em
        {\hss\@textsuperscript{\normalfont\@thefnmark}}##1
      }
      \if@twocolumn
        \ifnum \col@number=\@ne
          \@maketitle
        \else
          \twocolumn[\@maketitle]%
        \fi
      \else
        \newpage
        % Prevent figures from going at top of page.
        \global\@topnum\z@
        \@maketitle
      \fi
      \thispagestyle{plain}\@thanks
    \endgroup
    \setcounter{footnote}{0}%
    \global\let\thanks\relax
    \global\let\maketitle\relax
    \global\let\@maketitle\relax
    \global\let\@thanks\@empty
    \global\let\@author\@empty
    \global\let\@date\@empty
    \global\let\title\relax
    \global\let\author\relax
    \global\let\date\relax
    \global\let\and\relax
  }
  \def\@maketitle{
    \newpage
    \null
    \vskip 2em
    \begin{center}
      \let \footnote \thanks
```

```
      {\LARGE \@title \par}
      \vskip 1.5em
      {\large \lineskip .5em
        \begin{tabular}[t]{c} \authornames \end{tabular}
      \par}
      \vskip 0.7em
      {\large \lineskip .5em
        \begin{tabular}[t]{c} \addressnames \end{tabular}
      \par}
      \vskip 1em
      {\large \@date}
    \end{center}
    \par
    \vskip 1.5em
  }
\fi
⟨/article⟩
```

7.2 Abstract Page

`\abstract` Setup an appropriate abstract page.

```
⟨*thesis | minithesis | progress | project | report | gdp⟩
\newenvironment{abstract}
{
  \btypeout{Abstract Page}
  \thispagestyle{empty}
  \null\vfil
  \begin{center}
    \setlength{\parskip}{0pt}
    {\textsc\normalsize \univname \par}
    \bigskip
    {\underline{Abstract} \par}
    \bigskip
    {\textsc\normalsize \facname \par}
⟨*thesis | minithesis | progress | project | report⟩
    {\textsc\normalsize \deptname \par}
⟨/thesis | minithesis | progress | project | report⟩
    \bigskip
⟨*thesis⟩
    {\normalsize \underline{Doctor of Philosophy}\par}
⟨/thesis⟩
⟨*minithesis⟩
    {\normalsize \underline{A mini-thesis submitted for transfer from MPhil to PhD}\par}
⟨/minithesis⟩
⟨*progress⟩
    {\normalsize \underline{A progress report submitted for continuation towards a PhD}\par}
⟨/progress⟩
⟨*project⟩
    {\normalsize \underline{A project report submitted for the award of \degreename}\par}
⟨/project⟩
⟨*gdp⟩
    {\normalsize \underline{A group design project report submitted for the award of \degreena
⟨/gdp⟩
```

```
    \bigskip
    {\normalsize\bf \@title \par}
    \medskip
    {\normalsize by \authornames \par}
    \bigskip
  \end{center}
}
{
  \vfil\vfil\vfil\null
  \cleardoublepage
}
⟨/thesis | minithesis | progress | project | report | gdp⟩
⟨*article⟩
\if@titlepage
  \renewenvironment{abstract}{
      \titlepage
      \null\vfil
      \@beginparpenalty\@lowpenalty
      \begin{center}
        \bfseries \abstractname
        \@endparpenalty\@M
      \end{center}
      \begin{itshape}
      \noindent
  }
  {
      \par
      \end{itshape}
      \if\keywordnames
      \else
        \quote
        \vskip 1.5em
        {\noindent \normalsize
            \textbf{Keywords:}
            \textit{\keywordnames}
        \par}
        \endquote
      \fi
      \vfil\null\endtitlepage
  }
\else
  \renewenvironment{abstract}{
      \if@twocolumn
        \section*{\abstractname}
      \else
        \small
        \begin{center}
          {\bfseries \abstractname\vspace{-.5em}\vspace{\z@}}
        \end{center}
        \quote
      \fi
      \begin{itshape}
  }
  {
```

```
      \end{itshape}
      \if\keywordnames
      \else
        \vskip 1.5em
        {\noindent \normalsize
            \textbf{Keywords:}
            \textit{\keywordnames}
        \par}
      \fi
      \if@twocolumn\else\endquote\fi
  }
\fi
⟨/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 pdfLaTeX.

```
⟨*thesis | minithesis | progress | project | report | gdp | article⟩
\usepackage[nottoc]{tocbibind}          % Put the Lists, Glossary, Biblog and Idx in the conte
\addtocounter{secnumdepth}{1}
\setcounter{tocdepth}{6}
\newcounter{dummy}
\newcommand\addtotoc[1]{
\refstepcounter{dummy}
⟨*thesis | minithesis | progress | project | report | gdp⟩
\addcontentsline{toc}{chapter}{#1}}
⟨/thesis | minithesis | progress | project | report | gdp⟩
⟨*article⟩
\addcontentsline{toc}{section}{#1}}
⟨/article⟩
```

7.3.2 Table of Contents

`\tableofcontents` Adjust line and paragraph spacing.

```
\renewcommand\tableofcontents{
\hypersetup{linkcolor={black}}
\btypeout{Table of Contents}
\begin{spacing}{1}{
    \setlength{\parskip}{1pt}
    \if@twocolumn
      \@restonecoltrue\onecolumn
    \else
      \@restonecolfalse
    \fi
⟨*thesis | minithesis | progress | project | report | gdp⟩
```

```
    \chapter*{\contentsname
⟨/thesis | minithesis | progress | project | report | gdp⟩
⟨*article⟩
    \section*{\contentsname
⟨/article⟩
        \@mkboth{
           \MakeUppercase\contentsname}{\MakeUppercase\contentsname}}
    \@starttoc{toc}
    \if@restonecol\twocolumn\fi
⟨thesis | minithesis | progress | project | report | gdp⟩    \cleardoublepage
}\end{spacing}
}
```

7.3.3 List of Figures

`\listoffigures` Adjust line and paragraph spacing.

```
\renewcommand\listoffigures{
\addtotoc{\listfigurename}
\begin{spacing}{1}{
    \setlength{\parskip}{1pt}
    \if@twocolumn
      \@restonecoltrue\onecolumn
    \else
      \@restonecolfalse
    \fi
⟨*thesis | minithesis | progress | project | report | gdp⟩
    \chapter*{\listfigurename
⟨/thesis | minithesis | progress | project | report | gdp⟩
⟨*article⟩
    \section*{\listfigurename
⟨/article⟩
      \@mkboth{\MakeUppercase\listfigurename}
              {\MakeUppercase\listfigurename}}
    \@starttoc{lof}
    \if@restonecol\twocolumn\fi
⟨*thesis | minithesis | progress | project | report | gdp⟩
    \cleardoublepage
⟨/thesis | minithesis | progress | project | report | gdp⟩
}\end{spacing}
}
```

7.3.4 List of Tables

`\listoftables` Adjust line and paragraph spacing.

```
\renewcommand\listoftables{
\addtotoc{\listtablename}
\begin{spacing}{1}{
    \setlength{\parskip}{1pt}
    \if@twocolumn
      \@restonecoltrue\onecolumn
    \else
      \@restonecolfalse
    \fi
```

```
⟨*thesis | minithesis | progress | project | report | gdp⟩
    \chapter*{\listtablename
⟨/thesis | minithesis | progress | project | report | gdp⟩
⟨*article⟩
    \section*{\listtablename
⟨/article⟩
      \@mkboth{
          \MakeUppercase\listtablename}{\MakeUppercase\listtablename}}
    \@starttoc{lot}
    \if@restonecol\twocolumn\fi
⟨*thesis | minithesis | progress | project | report | gdp⟩
    \cleardoublepage
⟨/thesis | minithesis | progress | project | report | gdp⟩
}\end{spacing}
}
```

7.3.5 List of Symbols

\listsymbolname
\listofsymbols

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

```
⟨*thesis | minithesis | progress | report | article⟩
\newcommand\listsymbolname{Definitions and Abbreviations}
⟨/thesis | minithesis | progress | report | article⟩
⟨*project | gdp⟩
\newcommand\listsymbolname{List of Symbols}
⟨/project | gdp⟩
\usepackage{longtable}
\newcommand\listofsymbols[2]{
\btypeout{\listsymbolname}
\addtotoc{\listsymbolname}
⟨*thesis | minithesis | progress | project | report | gdp⟩
    \chapter*{\listsymbolname
⟨/thesis | minithesis | progress | project | report | gdp⟩
⟨*article⟩
    \section*{\listsymbolname
⟨/article⟩
      \@mkboth{
          \MakeUppercase\listsymbolname}{\MakeUppercase\listsymbolname}}
\begin{longtable}[c]{#1}#2\end{longtable}\par
⟨*thesis | minithesis | progress | project | report | gdp⟩
    \cleardoublepage
⟨/thesis | minithesis | progress | project | report | gdp⟩
}
⟨/thesis | minithesis | progress | project | report | gdp | article⟩
```

7.3.6 List of Additional Material

\addmaterialname
\listofaddmaterial
\addtolom

Provide a `listofaddmaterial` command to produce a list of additional material, the name can be changed with `\addmaterialname{NewName}`

Material can be added by using `\addcontentsline{lom}{chapter}{Material Name}`

```
\newcommand\addmaterialname{List of Additional Material}
\newcommand\listofaddmaterial{
\addtotoc{\addmaterialname}
\begin{spacing}{1}{
```

```
    \setlength{\parskip}{1pt}
    \if@twocolumn
      \@restonecoltrue\onecolumn
    \else
      \@restonecolfalse
    \fi
⟨*thesis | minithesis | progress | project | report | gdp⟩
    \chapter*{\addmaterialname
⟨/thesis | minithesis | progress | project | report | gdp⟩
⟨*article⟩
    \section*{\addmaterialname
⟨/article⟩
      \@mkboth{
          \MakeUppercase\addmaterialname}{\MakeUppercase\addmaterialname}}
    \@starttoc{lom}
    \if@restonecol\twocolumn\fi
⟨*thesis | minithesis | progress | project | report | gdp⟩
    \cleardoublepage
⟨/thesis | minithesis | progress | project | report | gdp⟩
}\end{spacing}
}
\newcommand\addtolom[1]{%
\addtocontents{lom}{\protect\contentsline{chapter}{\protect\numberline{}#1}{}{}}
}
```

7.4 Declaration of Authorship

`\authorshipdeclaration`

Taken from Modified Template by Lovell 9.3

TODO: Consider a separate dissertation class for non techinical?

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

```
⟨*thesis | minithesis | progress | report | article⟩
\usepackage{xifthen}
\newcommand\authorshipdeclaration[1]{
\btypeout{Declaration of Authorship}
\addtotoc{Declaration of Authorship}
\thispagestyle{plain}
\null\vfil
\vskip 60\p@
\begin{center}{\Large\bf Declaration of Authorship \par}\end{center}
I declare that this thesis and the work presented in it is my own and has
been generated by me as the result of my own original research.

I confirm that:

\begin{enumerate}
\item This work was done wholly or mainly while in candidature for a research degree at this
\item Where any part of this thesis has previously been submitted for a degree or any other qu
\item Where I have consulted the published work of others, this is always clearly attributed;
\item Where I have quoted from the work of others, the source is always given. With the excep
```

```
\item I have acknowledged all main sources of help;
\item Where the thesis is based on work done by myself jointly with others, I have made clear

\ifthenelse{\isempty{#1}}
{\item None of this work has been published before submission}
{\item Parts of this work have been published as: #1}
\end{enumerate}

\vspace{15.0mm}
\begin{minipage}[t]{0.7\textwidth}
  Signed:.....................................................................
\end{minipage}%
\begin{minipage}[t]{0.3\textwidth}
  Date:...................
\end{minipage}
\vfil\vfil\null
\cleardoublepage
}
```
⟨/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

```
⟨*thesis⟩
\usepackage[export]{adjustbox} % for Soton logo alignment
\newcommand\copyrightDeclaration[1]{

\btypeout{Copyright declaration}
\thispagestyle{plain}

\hspace{-1.5in}\hspace{2.5cm}\begin{minipage}{17cm}
\null\vfil
\includegraphics[width=6cm,right]{UoSLogo.png}

\vskip 60\p@
\begin{center}{\selectfont\huge
\textcolor{custGray}{University~of~Southampton~Research~Repository}\par}
\end{center}
\vspace{1cm}

{\fontfamily{fds}\selectfont

\noindent Copyright \textcopyright~ and Moral Rights for this thesis and, where
applicable, any accompanying data are retained by the author and/or other
copyright owners. A copy can be downloaded for personal non-commercial research
or study, without prior permission or charge. This thesis and the accompanying
data cannot be reproduced or quoted extensively from without first obtaining
permission in writing from the copyright holder/s. The content of the thesis
and accompanying research data (where applicable) must not be changed in any
way or sold commercially in any format or medium without the formal permission
of the copyright holder/s.

```

```
\vspace{0.5cm}

When referring to this thesis and any accompanying data, full bibliographic
details must be given, e.g.

\vspace{0.5cm}

Thesis: Author (Year of Submission) "Full thesis title", University of
Southampton, name of the University Faculty or School or Department,
PhD Thesis, pagination.

\vspace{0.5cm}

Data: Author (Year) Title. URI [dataset]}
\end{minipage}
\vfil\vfil\null
\cleardoublepage
}

\usepackage{lastpage} % counts the full number of pages

⟨/thesis⟩
```

7.6 Acknowledgements

`\acknowledgements` Thank someone!

```
\newcommand\acknowledgements[1]{
\btypeout{Acknowledgements}
\addtotoc{Acknowledgements}
⟨∗thesis | minithesis | progress | project | report | gdp⟩
\thispagestyle{plain}
\null\vfil
\vskip 60\p@
\begin{center}{\Large\bf Acknowledgements \par}\end{center}
{\normalsize #1}
\vfil\vfil\null
\cleardoublepage
⟨/thesis | minithesis | progress | project | report | gdp⟩
⟨∗article⟩
\section*{Acknowledgements}
{\normalsize #1}
⟨/article⟩
}
```

7.7 Dedicatory

`\dedicatory` Dedicate the document to someone!

```
\newcommand\dedicatory[1]{
\btypeout{Dedicatory}
⟨∗thesis | minithesis | progress | project | report | gdp⟩
\thispagestyle{plain}
\null\vfil
\vskip 60\p@
```

```
\begin{center}{\Large \sl #1}\end{center}
\vfil\null
\cleardoublepage
⟨/thesis | minithesis | progress | project | report | gdp⟩
}
```

8 Parts

\frontmatter
\mainmatter
\backmatter
\appendix

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

```
⟨*article⟩
\newcommand\frontmatter{ }
\newcommand\mainmatter{ }
\newcommand\bibname{References}
\newcommand\backmatter{}
⟨/article⟩
⟨*thesis | minithesis | progress | project | report | gdp⟩
\renewcommand\bibname{References}
\let\oldappendix\appendix % Put full appendix name in ToC
\renewcommand{\appendix}{%
  \oldappendix
  \let\oldacl@pp=\addcontentsline
  \def\addcontentsline##1##2##3{\oldacl@pp{##1}{##2}{\appendixname\space ##3}}
}
\let\oldbackmatter\backmatter
\def\backmatter{%
  \oldbackmatter
  \let\addcontentsline=\oldacl@pp
  }
⟨/thesis | minithesis | progress | project | report | gdp⟩

⟨/thesis | minithesis | progress | project | report | article | gdp | gdpsummary⟩
```

9 Example Documents

```
⟨*testthesis⟩
\documentclass[sotoncolour]{uosthesis}      % Use the Thesis Style with custom link colour
⟨/testthesis⟩
⟨*testminithesis⟩
\documentclass[sotoncolour]{uosminithesis}  % Use the minithesis Style with custom link colour
⟨/testminithesis⟩
⟨*testprogress⟩
\documentclass[sotoncolour]{uosprogress}    % Use the progress Style with custom link colour
⟨/testprogress⟩
⟨*testproject⟩
\documentclass[sotoncolour]{uosproject}     % Use the Project Style with custom link colour
⟨/testproject⟩
⟨*testreport⟩
\documentclass[sotoncolour]{uosreport}      % Use the Report Style with custom link colour
⟨/testreport⟩
```

```
⟨*testarticle⟩
\documentclass[sotoncolour]{uosarticle}     % Use the Article Style with custom link colour
⟨/testarticle⟩
⟨*testgdp⟩
\documentclass[sotoncolour]{uosgdp}         % Use the GDP Report Style with custom link colour
⟨/testgdp⟩
⟨*testgdpsummary⟩
\documentclass[sotoncolour]{uosgdpsummary}  % Use the GDP Summary Report Style with custom lin
⟨/testgdpsummary⟩
⟨*testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary⟩
\graphicspath{{../Figures/}}   % Location of your graphics files
\usepackage{natbib}            % Use Natbib style for the refs.
⟨*testthesis | testminithesis | testproject | testreport | testgdp⟩
\usepackage{bibentry}          % Use bibentry for prepublished works
\nobibliography*               % Use bibentry for prepublished works
\usepackage{attrib}            % Use the attrib package for quotations
⟨/testthesis | testminithesis | testproject | testreport | testgdp⟩
\hypersetup{colorlinks=true}   % Set to false for black/white printing
\input{Definitions}            % Include your abbreviations
%% ------------------------------------------------------------------
%% --------------------THESIS/DOC INFORMATION ---------------------
\department  {School of [Insert school]}
\DEPARTMENT  {\MakeUppercase{\deptname}}
\group       {[Group name]}
\GROUP       {\MakeUppercase{\groupname}}
\faculty     {Faculty of [Insert faculty]}
\FACULTY     {\MakeUppercase{\facname}}
\title      {An Investigation into \dots}
⟨*testthesis⟩
\authors    {Insert name, for example, Sarah Alison Watson} % Use of Soton Email unadvised, us
⟨/testthesis⟩
⟨*testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary⟩
\authors    {\texorpdfstring
             {\href{mailto:S.A.Watson@soton.ac.uk}{Name and email, for example, Sarah Alison W
             {Name and email, for example, Sarah Alison Watson}
            }
⟨/testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary⟩
\addresses  {\groupname\\\deptname\\\univname}
\date       {\today}
⟨*testminithesis | testprogress | testproject | testgdp | testgdpsummary⟩
% \supervisor[s] {Mr Beavis and Mrs S Supervisor}
\supervisor {Mr Beavis}
% \examiner[s] {Dr Butthead and Dr A.N. Other}
\examiner   {Dr Butthead}
⟨/testminithesis | testprogress | testproject | testgdp | testgdpsummary⟩
⟨*testproject⟩
\degree     {BEng Electronic Engineering}
⟨/testproject⟩
⟨*testgdp | testgdpsummary⟩
\degree     {Master of Engineering}
⟨/testgdp | testgdpsummary⟩
%% Optional Fields
⟨testthesis | testminithesis | testprogress⟩ \qualifications{MEng PhD}
⟨*testthesis⟩
```

```
\orcidid{0000-0002-1825-0097}
\doi{10.1002/0470841559.ch1}
\volume{n}{m} %Optional Volume Numbering Volume n of m
⟨/testthesis⟩
\subject    {}
\keywords   {}

\begin{document}
%% ------------------ FRONT MATTER ORGANISATION -------------------
⟨*testthesis⟩
\pagenumbering{gobble} % removes page number
\copyrightDeclaration{} % !!! Comment this line when printing the hardcopy !!!
\raggedright                  %% Set the style to Left justification, remove for fill justific
                              %% Must be done after copyrightDeclaration
⟨/testthesis⟩
\frontmatter
\maketitle
⟨/testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary⟩
⟨*testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp⟩
\begin{abstract}
This work is all about \dots
⟨*testthesis | testminithesis | testprogress⟩
There are broad instructions for this template entitled: How to use the University of Southamp

There is no prescribed font, you should use a font appropriate to your discipline.  See Produc
⟨/testthesis | testminithesis | testprogress⟩
\end{abstract}
⟨*testthesis | testminithesis | testprogress | testproject | testreport | testgdp⟩
\tableofcontents
\listoffigures
\listoftables
%% The List of listings does not, by default, appear in the ToC, so....
\addtotoc{Listings}
\lstlistoflistings
\listofaddmaterial
\addtolom{Material Name e.g Map}
\addtolom{Material Name e.g CD}
\addtolom{Test Material}
⟨*testthesis | testminithesis | testproject | testreport | testgdp⟩
%% ---------- AUTHORSHIP DECLARATION/ ACKNOW. / DEDICATORY ----------
%% Either include citations like below (as many as required spaced with commas or 'and').
%% \bibentry command must be used here with prepublished papers
% https://www.stefaanlippens.net/bibentry/
\authorshipdeclaration{\bibentry{Gunn:2001:pdflatex}, \bibentry{Lovell:2011:updated} and \bibe
%% Or state no citations like below
%% \authorshipdeclaration{}
%% -----------------------
\acknowledgements{Thanks to no one.}
\dedicatory{To \dots}
⟨/testthesis | testminithesis | testproject | testreport | testgdp⟩
%%Lightweight Definitions and Abbreviations see package:nomencl for alternative
%% Include if relevant to discipline
\listofsymbols{ll}{$w$ & The weight vector\\$\S$ & If relevant to discipline}
⟨/testthesis | testminithesis | testprogress | testproject | testreport | testgdp⟩
```

```
⟨/testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp⟩
⟨*testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary⟩
\mainmatter
%% ------------------ MAIN MATTER (CONTENT) --------------------
⟨/testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary⟩
⟨*testthesis | testminithesis | testprogress | testproject | testreport | testgdp⟩
\include{Introduction}
\include{Conclusions}
\begin{lstlisting}[caption=Without a title it doesn't appear in the table]
This is a test listing

It has several lines
That
say not much at all
\end{lstlisting}
\appendix
\include{AppendixA}
\backmatter
⟨*testthesis | testminithesis | testprogress⟩
\chapter{Glossary [if relevant]}
⟨/testthesis | testminithesis | testprogress⟩
\bibliographystyle{uos}
\bibliography{UOS}
⟨*testthesis | testminithesis | testprogress⟩
\chapter{Bibliography}
To use bibliography as well as the references section use the \texttt{multibbl} package.
\chapter{Index [if relevant]}
⟨/testthesis | testminithesis | testprogress⟩
⟨/testthesis | testminithesis | testprogress | testproject | testreport | testgdp⟩
⟨*testgdpsummary⟩
\section*{Introduction}
\section*{Objectives}
\section*{Resources}
\section*{Constraints}
\section*{Approaching the task}
\section*{Team Organisation}
\section*{Important Results}
\section*{Conclusions}
\section*{Recommendations}
⟨/testgdpsummary⟩
⟨*introduction⟩
\chapter{Introduction} \label{Chapter:Introduction}
⟨/introduction⟩
⟨*testarticle⟩
\section{Introduction} \label{Section:Introduction}
⟨/testarticle⟩
⟨*introduction | testarticle⟩
You probably found all the files from \cite{Gunn:2001:pdflatex}.
\tref{Table:tabex} illustrates the results of my work.
\begin{table}[!htb]
  \centering
  \begin{tabular}{cc}
  \toprule
  \textbf{Training Error} & \textbf{Testing Error}\\
```

```
  \midrule
  0 & $\infty$\\
  \bottomrule
  \end{tabular}
  \caption{The Results}
  \label{Table:tabex}
\end{table}

\fref{Figure:figex} shows why this is the case.
\begin{figure}[!htb]
  \centering
  \includegraphics[width=8cm]{figure}
  \caption{A colourful picture.}
  \label{Figure:figex}
\end{figure}

This page shows you a subfigure example in \fref{Figure:figsubex}.
\begin{figure}[!htb]
  \centering
  \subcaptionbox{The left caption}{
    \includegraphics[width=4.2cm]{figure}
    \label{Figure:figsubex:left}
  }
  \subcaptionbox{The right caption}{
    \includegraphics[width=4.2cm]{figure}
    \label{Figure:figsubex:right}
  }
  \caption{A doubly colourful picture.}
  \label{Figure:figsubex}
\end{figure}
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec rutrum sodales ligula, ac aliqu

\section{A Section of a chapter}
Nulla molestie velit sed dui ullamcorper viverra. Fusce placerat vulputate lacus eu consequat.

\subsection{Some quotes}

Nam egestas felis euismod erat tincidunt ornare. Nulla hendrerit tempor purus ac consequat. Al
\begin{quote}
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec rutrum sodales ligula, ac aliqu
\end{quote}

Pellentesque sodales lobortis feugiat. Vivamus volutpat mauris id odio aliquam maximus sed sit
\begin{quote}
The \verb|\attrib| macro attributes block elements, for example when citing
a reference after a block quotation.
\attrib{\cite{attribpackage}}
\end{quote}

Donec vitae massa nisi. Praesent sed sollicitudin urna. Suspendisse vitae cursus tortor. In eg
⟨/introduction | testarticle⟩
⟨*conclusions⟩
\chapter{Conclusions} \label{Chapter: Conclusions}
⟨/conclusions⟩
```

```
⟨*testarticle⟩
%% ------------------------------------------------------------------
\section{Conclusions} \label{Section: Conclusions}
⟨/testarticle⟩
⟨*conclusions | testarticle⟩
It works.
⟨/conclusions | testarticle⟩
⟨*testarticle⟩
\acknowledgements{Thanks to no one.}
\backmatter
\appendix
\bibliographystyle{uos}
\bibliography{UOS}
⟨/testarticle⟩
⟨*appendix | testarticle⟩
⟨*appendix⟩
\chapter{Stuff} \label{Chapter:Stuff}
⟨/appendix⟩
⟨*testarticle⟩
%% ------------------------------------------------------------------
\section{Stuff} \label{Section:Stuff}
⟨/testarticle⟩
The following gets in the way of the text....
⟨/appendix | testarticle⟩
⟨*testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary⟩
\end{document}
%% ------------------------------------------------------------------
⟨/testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary⟩
```

9.1 Example Figure

```
⟨*figure⟩
%%BoundingBox: 0 150 600 650
%%EndComments
0.0 setlinewidth
/length 0.1 def
/width 0.02 def
/hsvcircle {
gsave
    /h 0.0 def
    0 4 360 {
    pop
    gsave
    0.5 0.0 translate
    newpath
    0.0 0.0 moveto
    length 0.0 lineto
    length width lineto
    0.0 width lineto
    closepath
    h 1.0 1.0 sethsbcolor
    fill
    grestore
    /h h 4 360 div add def
    4 rotate
```

```
    } for
grestore
} def
0.0 setlinewidth
0.0 setgray
300 400 translate
500 500 scale
30 rotate
1.0 0.7 scale
-30 rotate
hsvcircle
0.8 0.8 scale
hsvcircle
0.8 0.8 scale
hsvcircle
0.8 0.8 scale
hsvcircle
0.8 0.8 scale
hsvcircle
0.8 0.8 scale
hsvcircle
0.8 0.8 scale
hsvcircle
showpage
```
⟨/figure⟩

9.2 Definitions File

⟨∗definitions⟩
```
\newcommand{\BibTeX}{{\rm B\kern-.05em{\sc i\kern-.025em b}\kern-.08em T\kern-.1667em\lower.7e

%% People
\newcounter{address}
\setcounter{address}{1}
\renewcommand{\theaddress}{\textsuperscript{\fnsymbol{address}}}
\newcommand{\address}[1]{\refstepcounter{address}\theaddress#1\\}
\newcommand{\Name}[3]{\texorpdfstring{\href{mailto:#3}{#2}#1}{#2}\xspace}
\newcommand{\SteveRGunn}[1]{\Name{#1}{Steve R. Gunn}{S.R.Gunn@ecs.soton.ac.uk}}

%% Dingbats
\newcommand{\tick}{\ding{51}}
\newcommand{\cross}{\ding{55}}

%% Calculus
\newcommand{\pd}[2]{\ensuremath{\frac{\partial #1}{\partial #2}}\xspace}
\newcommand{\fd}[2]{\ensuremath{\frac{d #1}{d #2}}\xspace}
\newcommand{\dint}{\ensuremath{\int\!\!\!\int}\xspace}
\newcommand{\tint}{\ensuremath{\int\!\!\!\int\!\!\!\int}\xspace}

%% Math Sets
\newcommand{\Q}[1]{\ensuremath{\mathbb{#1}}\xspace}
\newcommand{\R}{\Q{R}}

%% Matrix, Vector
\newcommand{\V}[1]{\ensuremath{\boldsymbol{#1}}\xspace}
```

```
\newcommand{\M}[1]{\ensuremath{\boldsymbol{#1}}\xspace}
\newcommand{\0}{\V{0}}
\newcommand{\1}{\V{1}}
\newcommand{\I}{\M{I}}

%% Math Functions
\newcommand{\F}[1]{\ensuremath{\mathrm{#1}}\xspace}
\newcommand{\sgn}{\F{sgn}}
\newcommand{\tr}{\F{trace}}
\newcommand{\diag}{\F{diag}}

%% Math Names
\newcommand{\N}[1]{\ensuremath{\mathit{#1}}\xspace}

%% Data
\newcommand{\mc}[1]{\ensuremath{\mathcal{#1}}\xspace}
\newcommand{\Hyp}{\mc{H}}
\newcommand{\D}{\mc{D}}

%% Kernel
\newcommand{\K}{\M{K}}
\newcommand{\eins}{\texorpdfstring{\ensuremath{\epsilon}}{\textepsilon}-insensitive\xspace}
\newcommand{\e}{\ensuremath{\epsilon}\xspace}
\newcommand{\Bxi}{\ensuremath{\boldsymbol{\xi}}\xspace}
\newcommand{\Kanova}{\ensuremath{\mathit{K_{ANOVA}}}\xspace}
\newcommand{\Kspline}{\ensuremath{\mathit{K_{spline}}}\xspace}

%% Bayesian
\newcommand{\MP}{\ensuremath{\mathit{{\scriptscriptstyle \hspace{-1.5pt}M\hspace{-1.5pt}P}}}\x
\newcommand{\ML}{\ensuremath{\mathit{{\scriptscriptstyle \hspace{-1.5pt}M\hspace{-1.5pt}L}}}\x
\newcommand{\Qw}{\ensuremath{Q_{\w}(\w)}\xspace}
\newcommand{\Qa}{\ensuremath{Q_{\Ba}(\Ba)}\xspace}
\newcommand{\Qb}{\ensuremath{Q_{\beta}(\beta)}\xspace}
\newcommand{\wMPab}{\ensuremath{\w_{\MP|\bar {\Ba},\bar \beta}}\xspace}
\newcommand{\wMP}{\ensuremath{\w_{\MP}}\xspace}
\newcommand{\yMP}{\ensuremath{y_{\MP}}\xspace}
\newcommand{\BaMP}{\ensuremath{\Ba_{\hspace{1pt}\MP}}\xspace}
\newcommand{\aMP}{\ensuremath{\alpha_{\hspace{1pt}\MP}}\xspace}
\newcommand{\bMP}{\ensuremath{\beta_{\hspace{1pt}\MP}}\xspace}
\newcommand{\Sab}{\ensuremath{\M{\Sigma}_{\bar \Ba,\bar \beta}}\xspace}
\newcommand{\Ba}{\ensuremath{\boldsymbol{\alpha}}\xspace}
\newcommand{\Bb}{\ensuremath{\boldsymbol{\beta}}\xspace}
\newcommand{\Bm}{\ensuremath{\boldsymbol{\mu}}\xspace}
\newcommand{\BL}{\ensuremath{\boldsymbol{\Lambda}}\xspace}
\newcommand{\BPhi}{\ensuremath{\boldsymbol{\Phi}}\xspace}
\newcommand{\SMP}{\ensuremath{\M{\Sigma}_{\MP}}\xspace}

\newcommand{\Pa}{\ensuremath{P(\alpha|\mathcal{H})}\xspace}
\newcommand{\Pb}{\ensuremath{P(\beta|\mathcal{H})}\xspace}
\newcommand{\Pab}{\ensuremath{P(\alpha,\beta|\mathcal{H})}\xspace}
\newcommand{\Pw}{\ensuremath{P(\w|\mathcal{H})}\xspace}
\newcommand{\PD}{\ensuremath{P(\D|\mathcal{H})}\xspace}
\newcommand{\PwIa}{\ensuremath{P(\w|\alpha,\mathcal{H})}\xspace}
\newcommand{\PDIwb}{\ensuremath{P(\D|\w,\beta,\mathcal{H})}\xspace}
```

```
\newcommand{\PDwab}{\ensuremath{P(\D,\w,\alpha,\beta|\mathcal{H})}\xspace}
\newcommand{\PDIw}{\ensuremath{P(\D|\w,\mathcal{H})}\xspace}
\newcommand{\PwID}{\ensuremath{P(\w|\D,\mathcal{H})}\xspace}
\newcommand{\PwabID}{\ensuremath{P(\w,\alpha,\beta|\D,\mathcal{H})}\xspace}

\newcommand{\PanH}{\ensuremath{P(\alpha)}\xspace}
\newcommand{\PbnH}{\ensuremath{P(\beta)}\xspace}
\newcommand{\PabnH}{\ensuremath{P(\alpha,\beta)}\xspace}
\newcommand{\PwnH}{\ensuremath{P(\w)}\xspace}
\newcommand{\PDnH}{\ensuremath{P(\D)}\xspace}
\newcommand{\PwIanH}{\ensuremath{P(\w|\alpha)}\xspace}
\newcommand{\PDIwbnH}{\ensuremath{P(\D|\w,\beta)}\xspace}
\newcommand{\PDwabnH}{\ensuremath{P(\D,\w,\Ba,\beta)}\xspace}
\newcommand{\PDIwnH}{\ensuremath{P(\D|\w)}\xspace}
\newcommand{\PwIDnH}{\ensuremath{P(\w|\D)}\xspace}
\newcommand{\PwabIDnH}{\ensuremath{P(\w,\alpha,\beta|\D)}\xspace}

\newcommand{\PDwBab}{\ensuremath{P(\D,\w,\Ba,\beta|\mathcal{H})}\xspace}
\newcommand{\PwIBa}{\ensuremath{P(\w|\Ba,\mathcal{H})}\xspace}
\newcommand{\PBab}{\ensuremath{P(\Ba,\beta|\mathcal{H})}\xspace}
\newcommand{\PwBabID}{\ensuremath{P(\w,\Ba,\beta|\D,\mathcal{H})}\xspace}

\newcommand{\PBanH}{\ensuremath{P(\Ba)}\xspace}
\newcommand{\PwIBanH}{\ensuremath{P(\w|\Ba)}\xspace}

%% Snakes
\newcommand{\Esnake}{\ensuremath{\mathit{E_{snake}}}\xspace}
\newcommand{\Eimage}{\ensuremath{\mathit{E_{image}}}\xspace}
\newcommand{\Econt}{\ensuremath{\mathit{E_{cont}}}\xspace}
\newcommand{\Ecurv}{\ensuremath{\mathit{E_{curv}}}\xspace}
\newcommand{\Eint}{\ensuremath{\mathit{E_{int}}}\xspace}
\newcommand{\Eext}{\ensuremath{\mathit{E_{ext}}}\xspace}
\newcommand{\Eterm}{\ensuremath{\mathit{E_{term}}}\xspace}
\newcommand{\Eline}{\ensuremath{\mathit{E_{line}}}\xspace}
\newcommand{\Eedge}{\ensuremath{\mathit{E_{edge}}}\xspace}
\newcommand{\Econ}{\ensuremath{\mathit{E_{con}}}\xspace}
\newcommand{\Eangle}{\ensuremath{\mathit{E_{angle}}}\xspace}
\newcommand{\Elshape}{\ensuremath{\mathit{E_{lshape}}}\xspace}
\newcommand{\Eedgedir}{\ensuremath{\mathit{E_{edgedir}}}\xspace}
\newcommand{\Emodel}{\ensuremath{\mathit{E_{model}}}\xspace}
\newcommand{\wte}{\ensuremath{\mathit{w_{term}}}\xspace}
\newcommand{\wli}{\ensuremath{\mathit{w_{line}}}\xspace}
\newcommand{\wed}{\ensuremath{\mathit{w_{edge}}}\xspace}
\newcommand{\wco}{\ensuremath{\mathit{w_{con}}}\xspace}


%% Environments
\newcounter{alg}
\newenvironment{algorithm}[1]
{
    \stepcounter{alg}
    \begin{table}[htb]
    \centering
    \begin{tabular}[t]{ll}
```

```
    \hline&\\
    \multicolumn{2}{l}{\bf Algorithm \arabic{alg}: #1}\\&\\
} {
    &\\
    \hline
    \end{tabular}
    \end{table}
}
```
⟨/definitions⟩

9.3 References File

⟨∗references⟩
```
@MISC{Gunn:2001:pdflatex,
  author =       {S.R. Gunn},
  title =        {PDFLaTeX Instructions},
  year =         {2001},
  url =          {http://www.ecs.soton.ac.uk/~srg/softwaretools/document/}
}
@MISC{Lovell:2011:updated,
  author =       {C. J. Lovell},
  title =        {Updated templates},
  year =         {2011}
}
@MISC{Gunn:2011:updated2,
  author =       {S.R. Gunn and C. J. Lovell},
  title =        {Updated templates reference 2},
  year =         {2011}
}
@MISC{attribpackage,
  author =       {Matt Swift},
  title =        {The attrib LaTeX package
attribution of block elements (Frankenstein's hat)},
  year =         {1999},
  url =          {http://cs.brown.edu/about/system/managed/latex/doc/attrib.pdf}
}

```
⟨/references⟩

9.4 Bibliography Style File

⟨∗bst⟩
```
%% File: 'uos.bst'
%% A modification of 'plainnat.bst' for use with natbib package
%%
%% Copyright 1993-1999 Patrick W Daly
%% Max-Planck-Institut f\"ur Aeronomie
%% Max-Planck-Str. 2
%% D-37191 Katlenburg-Lindau
%% Germany
%% E-mail: daly@linmpi.mpg.de
%%
%% This program can be redistributed and/or modified under the terms
%% of the LaTeX Project Public License Distributed from CTAN
%% archives in directory macros/latex/base/lppl.txt; either
%% version 1 of the License, or any later version.
```

```
%%
%% Includes field URL for Internet addresses
%%
ENTRY
  { address
    author
    booktitle
    chapter
    edition
    editor
    howpublished
    institution
    isbn
    issn
    journal
    key
    month
    note
    number
    organization
    pages
    publisher
    school
    series
    title
    type
    url
    volume
    year
  }
  {}
  { label extra.label sort.label short.list }

INTEGERS { output.state before.all mid.sentence after.sentence after.block }

FUNCTION {init.state.consts}
{ #0 'before.all :=
  #1 'mid.sentence :=
  #2 'after.sentence :=
  #3 'after.block :=
}

STRINGS { s t }

FUNCTION {output.nonnull}
{ 's :=
  output.state mid.sentence =
    { ", " * write$ }
    { output.state after.block =
        { add.period$ write$
          newline$
          "\newblock " write$
        }
        { output.state before.all =
```

```
            'write$
            { add.period$ " " * write$ }
          if$
        }
      if$
      mid.sentence 'output.state :=
    }
  if$
  s
}

FUNCTION {output}
{ duplicate$ empty$
    'pop$
    'output.nonnull
  if$
}

FUNCTION {output.check}
{ 't :=
  duplicate$ empty$
    { pop$ "empty " t * " in " * cite$ * warning$ }
    'output.nonnull
  if$
}

FUNCTION {fin.entry}
{ add.period$
  write$
  newline$
}

FUNCTION {new.block}
{ output.state before.all =
    'skip$
    { after.block 'output.state := }
  if$
}

FUNCTION {new.sentence}
{ output.state after.block =
    'skip$
    { output.state before.all =
        'skip$
        { after.sentence 'output.state := }
      if$
    }
  if$
}

FUNCTION {not}
{   { #0 }
    { #1 }
  if$
```

```
}

FUNCTION {and}
{   'skip$
    { pop$ #0 }
  if$
}

FUNCTION {or}
{   { pop$ #1 }
    'skip$
  if$
}

FUNCTION {new.block.checka}
{ empty$
    'skip$
    'new.block
  if$
}

FUNCTION {new.block.checkb}
{ empty$
  swap$ empty$
  and
    'skip$
    'new.block
  if$
}

FUNCTION {new.sentence.checka}
{ empty$
    'skip$
    'new.sentence
  if$
}

FUNCTION {new.sentence.checkb}
{ empty$
  swap$ empty$
  and
    'skip$
    'new.sentence
  if$
}

FUNCTION {field.or.null}
{ duplicate$ empty$
    { pop$ "" }
    'skip$
  if$
}

FUNCTION {emphasize}
```

```
{ duplicate$ empty$
    { pop$ "" }
    { "{\em " swap$ * "}" * }
  if$
}

INTEGERS { nameptr namesleft numnames }

FUNCTION {format.names}
{ 's :=
  #1 'nameptr :=
  s num.names$ 'numnames :=
  numnames 'namesleft :=
    { namesleft #0 > }
    { s nameptr "{ff~}{vv~}{ll}{, jj}" format.name$ 't :=
      nameptr #1 >
        { namesleft #1 >
            { ", " * t * }
            { numnames #2 >
                { "," * }
                'skip$
              if$
              t "others" =
                { " et~al." * }
                { " and " * t * }
              if$
            }
          if$
        }
        't
      if$
      nameptr #1 + 'nameptr :=
      namesleft #1 - 'namesleft :=
    }
  while$
}

FUNCTION {format.key}
{ empty$
    { key field.or.null }
    { "" }
  if$
}

FUNCTION {format.authors}
{ author empty$
    { "" }
    { author format.names }
  if$
}

FUNCTION {format.editors}
{ editor empty$
    { "" }
```

```
    { editor format.names
      editor num.names$ #1 >
        { ", editors" * }
        { ", editor" * }
      if$
    }
  if$
}

FUNCTION {format.isbn}
{ isbn empty$
    { "" }
    { new.block "ISBN " isbn * }
  if$
}

FUNCTION {format.issn}
{ issn empty$
    { "" }
    { new.block "ISSN " issn * }
  if$
}

%FUNCTION {format.url}
%{ url empty$
%    { "" }
%    { new.block "URL \url{" url * "}" * }
%  if$
%}
%
%FUNCTION {format.title}
%{ title empty$
%    { "" }
%    { title "t" change.case$ }
%  if$
%}
FUNCTION {format.url}
{ ""
}

FUNCTION {format.title}
{ title empty$
    { "" }
    { url empty$
        { title "t" change.case$ }
        { "\href{" url * "}{" * title "t" change.case$ * "}" * }
      if$
    }
    if$
}


FUNCTION {format.full.names}
{'s :=
```

```
  #1 'nameptr :=
  s num.names$ 'numnames :=
  numnames 'namesleft :=
    { namesleft #0 > }
    { s nameptr
      "{vv~}{ll}" format.name$ 't :=
      nameptr #1 >
        {
          namesleft #1 >
            { ", " * t * }
            {
              numnames #2 >
                { "," * }
                'skip$
              if$
              t "others" =
                { " et~al." * }
                { " and " * t * }
              if$
            }
          if$
        }
        't
      if$
      nameptr #1 + 'nameptr :=
      namesleft #1 - 'namesleft :=
    }
  while$
}

FUNCTION {author.editor.full}
{ author empty$
    { editor empty$
        { "" }
        { editor format.full.names }
      if$
    }
    { author format.full.names }
  if$
}

FUNCTION {author.full}
{ author empty$
    { "" }
    { author format.full.names }
  if$
}

FUNCTION {editor.full}
{ editor empty$
    { "" }
    { editor format.full.names }
  if$
}
```

```
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" }
```

```
            { "Number" }
          if$
          number tie.or.space.connect
          series empty$
            { "there's a number but no series in " cite$ * warning$ }
            { " in " * series * }
          if$
        }
      if$
    }
    { "" }
  if$
}

FUNCTION {format.edition}
{ edition empty$
    { "" }
    { output.state mid.sentence =
        { edition "l" change.case$ " edition" * }
        { edition "t" change.case$ " edition" * }
      if$
    }
  if$
}

INTEGERS { multiresult }

FUNCTION {multi.page.check}
{ 't :=
  #0 'multiresult :=
    { multiresult not
      t empty$ not
      and
    }
    { t #1 #1 substring$
      duplicate$ "-" =
      swap$ duplicate$ "," =
      swap$ "+" =
      or or
        { #1 'multiresult := }
        { t #2 global.max$ substring$ 't := }
      if$
    }
  while$
  multiresult
}

FUNCTION {format.pages}
{ pages empty$
    { "" }
    { pages multi.page.check
        { "pages" pages n.dashify tie.or.space.connect }
        { "page" pages tie.or.space.connect }
      if$
```

```
    }
  if$
}

FUNCTION {format.vol.num.pages}
{ volume field.or.null
  number empty$
    'skip$
    { "\penalty0 (" number * ")" * *
      volume empty$
        { "there's a number but no volume in " cite$ * warning$ }
        'skip$
      if$
    }
  if$
  pages empty$
    'skip$
    { duplicate$ empty$
        { pop$ format.pages }
        { ":\penalty0 " * pages n.dashify * }
      if$
    }
  if$
}

FUNCTION {format.chapter.pages}
{ chapter empty$
    'format.pages
    { type empty$
        { "chapter" }
        { type "l" change.case$ }
      if$
      chapter tie.or.space.connect
      pages empty$
        'skip$
        { ", " * format.pages * }
      if$
    }
  if$
}

FUNCTION {format.in.ed.booktitle}
{ booktitle empty$
    { "" }
    { editor empty$
        { "In " booktitle emphasize * }
        { "In " format.editors * ", " * booktitle emphasize * }
      if$
    }
  if$
}

FUNCTION {empty.misc.check}
{ author empty$ title empty$ howpublished empty$
```

```
  month empty$ year empty$ note empty$
  and and and and and
  key empty$ not and
    { "all relevant fields are empty in " cite$ * warning$ }
    'skip$
  if$
}

FUNCTION {format.thesis.type}
{ type empty$
    'skip$
    { pop$
      type "t" change.case$
    }
  if$
}

FUNCTION {format.tr.number}
{ type empty$
    { "Technical Report" }
    'type
  if$
  number empty$
    { "t" change.case$ }
    { number tie.or.space.connect }
  if$
}

FUNCTION {format.article.crossref}
{ key empty$
    { journal empty$
        { "need key or journal for " cite$ * " to crossref " * crossref *
          warning$
          ""
        }
        { "In {\em " journal * "\/}" * }
      if$
    }
    { "In " key * }
  if$
  " \citep{" * crossref * "}" *
}

FUNCTION {format.book.crossref}
{ volume empty$
    { "empty volume in " cite$ * "'s crossref of " * crossref * warning$
      "In "
    }
    { "Volume" volume tie.or.space.connect
      " of " *
    }
  if$
  editor empty$
  editor field.or.null author field.or.null =
```

```
  or
    { key empty$
        { series empty$
            { "need editor, key, or series for " cite$ * " to crossref " *
              crossref * warning$
              "" *
            }
            { "{\em " * series * "\/}" * }
          if$
        }
        { key * }
      if$
    }
    'skip$
  if$
  ", \citet{" * crossref * "}" *
}

FUNCTION {format.incoll.inproc.crossref}
{ editor empty$
  editor field.or.null author field.or.null =
  or
    { key empty$
        { booktitle empty$
            { "need editor, key, or booktitle for " cite$ * " to crossref " *
              crossref * warning$
              ""
            }
            { "In {\em " booktitle * "\/}" * }
          if$
        }
        { "In " key * }
      if$
    }
    { "In " }
  if$
  " \citet{" * crossref * "}" *
}

FUNCTION {article}
{ output.bibitem
  format.authors "author" output.check
  author format.key output
  new.block
  format.title "title" output.check
  new.block
  crossref missing$
    { journal emphasize "journal" output.check
      format.vol.num.pages output
      format.date "year" output.check
    }
    { format.article.crossref output.nonnull
      format.pages output
    }
```

```
  if$
  format.issn output
  format.url output
  new.block
  note output
  fin.entry
}

FUNCTION {book}
{ output.bibitem
  author empty$
    { format.editors "author and editor" output.check
      editor format.key output
    }
    { format.authors output.nonnull
      crossref missing$
        { "author and editor" editor either.or.check }
        'skip$
      if$
    }
  if$
  new.block
  format.btitle "title" output.check
  crossref missing$
    { format.bvolume output
      new.block
      format.number.series output
      new.sentence
      publisher "publisher" output.check
      address output
    }
    { new.block
      format.book.crossref output.nonnull
    }
  if$
  format.edition output
  format.date "year" output.check
  format.isbn output
  format.url output
  new.block
  note output
  fin.entry
}

FUNCTION {booklet}
{ output.bibitem
  format.authors output
  author format.key output
  new.block
  format.title "title" output.check
  howpublished address new.block.checkb
  howpublished output
  address output
  format.date output
```

```
  format.isbn output
  format.url output
  new.block
  note output
  fin.entry
}

FUNCTION {inbook}
{ output.bibitem
  author empty$
    { format.editors "author and editor" output.check
      editor format.key output
    }
    { format.authors output.nonnull
      crossref missing$
        { "author and editor" editor either.or.check }
        'skip$
      if$
    }
  if$
  new.block
  format.btitle "title" output.check
  crossref missing$
    { format.bvolume output
      format.chapter.pages "chapter and pages" output.check
      new.block
      format.number.series output
      new.sentence
      publisher "publisher" output.check
      address output
    }
    { format.chapter.pages "chapter and pages" output.check
      new.block
      format.book.crossref output.nonnull
    }
  if$
  format.edition output
  format.date "year" output.check
  format.isbn output
  format.url output
  new.block
  note output
  fin.entry
}

FUNCTION {incollection}
{ output.bibitem
  format.authors "author" output.check
  author format.key output
  new.block
  format.title "title" output.check
  new.block
  crossref missing$
    { format.in.ed.booktitle "booktitle" output.check
```

```
      format.bvolume output
      format.number.series output
      format.chapter.pages output
      new.sentence
      publisher "publisher" output.check
      address output
      format.edition output
      format.date "year" output.check
    }
    { format.incoll.inproc.crossref output.nonnull
      format.chapter.pages output
    }
  if$
  format.isbn output
  format.url output
  new.block
  note output
  fin.entry
}

FUNCTION {inproceedings}
{ output.bibitem
  format.authors "author" output.check
  author format.key output
  new.block
  format.title "title" output.check
  new.block
  crossref missing$
    { format.in.ed.booktitle "booktitle" output.check
      format.bvolume output
      format.number.series output
      format.pages output
      address empty$
        { organization publisher new.sentence.checkb
          organization output
          publisher output
          format.date "year" output.check
        }
        { address output.nonnull
          format.date "year" output.check
          new.sentence
          organization output
          publisher output
        }
      if$
    }
    { format.incoll.inproc.crossref output.nonnull
      format.pages output
    }
  if$
  format.isbn output
  format.url output
  new.block
  note output
```

```
  fin.entry
}

FUNCTION {conference} { inproceedings }

FUNCTION {manual}
{ output.bibitem
  format.authors output
  author format.key output
  new.block
  format.btitle "title" output.check
  organization address new.block.checkb
  organization output
  address output
  format.edition output
  format.date output
  format.url output
  new.block
  note output
  fin.entry
}

FUNCTION {mastersthesis}
{ output.bibitem
  format.authors "author" output.check
  author format.key output
  new.block
  format.title "title" output.check
  new.block
  "Master's thesis" format.thesis.type output.nonnull
  school "school" output.check
  address output
  format.date "year" output.check
  format.url output
  new.block
  note output
  fin.entry
}

FUNCTION {misc}
{ output.bibitem
  format.authors output
  author format.key output
  title howpublished new.block.checkb
  format.title output
  howpublished new.block.checka
  howpublished output
  format.date output
  format.issn output
  format.url output
  new.block
  note output
  fin.entry
  empty.misc.check
```

```
}

FUNCTION {phdthesis}
{ output.bibitem
  format.authors "author" output.check
  author format.key output
  new.block
  format.btitle "title" output.check
  new.block
  "PhD thesis" format.thesis.type output.nonnull
  school "school" output.check
  address output
  format.date "year" output.check
  format.url output
  new.block
  note output
  fin.entry
}

FUNCTION {proceedings}
{ output.bibitem
  format.editors output
  editor format.key output
  new.block
  format.btitle "title" output.check
  format.bvolume output
  format.number.series output
  address output
  format.date "year" output.check
  new.sentence
  organization output
  publisher output
  format.isbn output
  format.url output
  new.block
  note output
  fin.entry
}

FUNCTION {techreport}
{ output.bibitem
  format.authors "author" output.check
  author format.key output
  new.block
  format.title "title" output.check
  new.block
  format.tr.number output.nonnull
  institution "institution" output.check
  address output
  format.date "year" output.check
  format.url output
  new.block
  note output
  fin.entry
```

```
}

FUNCTION {unpublished}
{ output.bibitem
  format.authors "author" output.check
  author format.key output
  new.block
  format.title "title" output.check
  format.url output
  new.block
  note "note" output.check
  format.date output
  fin.entry
}

FUNCTION {default.type} { misc }


MACRO {jan} {"January"}

MACRO {feb} {"February"}

MACRO {mar} {"March"}

MACRO {apr} {"April"}

MACRO {may} {"May"}

MACRO {jun} {"June"}

MACRO {jul} {"July"}

MACRO {aug} {"August"}

MACRO {sep} {"September"}

MACRO {oct} {"October"}

MACRO {nov} {"November"}

MACRO {dec} {"December"}



MACRO {acmcs} {"ACM Computing Surveys"}

MACRO {acta} {"Acta Informatica"}

MACRO {cacm} {"Communications of the ACM"}

MACRO {ibmjrd} {"IBM Journal of Research and Development"}

MACRO {ibmsj} {"IBM Systems Journal"}

```

```
MACRO {ieeese} {"IEEE Transactions on Software Engineering"}

MACRO {ieeetc} {"IEEE Transactions on Computers"}

MACRO {ieeetcad}
 {"IEEE Transactions on Computer-Aided Design of Integrated Circuits"}

MACRO {ipl} {"Information Processing Letters"}

MACRO {jacm} {"Journal of the ACM"}

MACRO {jcss} {"Journal of Computer and System Sciences"}

MACRO {scp} {"Science of Computer Programming"}

MACRO {sicomp} {"SIAM Journal on Computing"}

MACRO {tocs} {"ACM Transactions on Computer Systems"}

MACRO {tods} {"ACM Transactions on Database Systems"}

MACRO {tog} {"ACM Transactions on Graphics"}

MACRO {toms} {"ACM Transactions on Mathematical Software"}

MACRO {toois} {"ACM Transactions on Office Information Systems"}

MACRO {toplas} {"ACM Transactions on Programming Languages and Systems"}

MACRO {tcs} {"Theoretical Computer Science"}


READ

FUNCTION {sortify}
{ purify$
  "l" change.case$
}

INTEGERS { len }

FUNCTION {chop.word}
{ 's :=
  'len :=
  s #1 len substring$ =
    { s len #1 + global.max$ substring$ }
    's
  if$
}

FUNCTION {format.lab.names}
{ 's :=
  s #1 "{vv~}{ll}" format.name$
  s num.names$ duplicate$
```

```
  #2 >
    { pop$ " et~al." * }
    { #2 <
        'skip$
        { s #2 "{ff }{vv }{ll}{ jj}" format.name$ "others" =
            { " et~al." * }
            { " and " * s #2 "{vv~}{ll}" format.name$ * }
          if$
        }
      if$
    }
  if$
}

FUNCTION {author.key.label}
{ author empty$
    { key empty$
        { cite$ #1 #3 substring$ }
        'key
      if$
    }
    { author format.lab.names }
  if$
}

FUNCTION {author.editor.key.label}
{ author empty$
    { editor empty$
        { key empty$
            { cite$ #1 #3 substring$ }
            'key
          if$
        }
        { editor format.lab.names }
      if$
    }
    { author format.lab.names }
  if$
}

FUNCTION {author.key.organization.label}
{ author empty$
    { key empty$
        { organization empty$
            { cite$ #1 #3 substring$ }
            { "The " #4 organization chop.word #3 text.prefix$ }
          if$
        }
        'key
      if$
    }
    { author format.lab.names }
  if$
}
```

```
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 :=
```

```
    { namesleft #0 > }
    { nameptr #1 >
        { "   " * }
        'skip$
      if$
      s nameptr "{vv{ } }{ll{ }}{  ff{ }}{  jj{ }}" format.name$ 't :=
      nameptr numnames = t "others" = and
        { "et al" * }
        { t sortify * }
      if$
      nameptr #1 + 'nameptr :=
      namesleft #1 - 'namesleft :=
    }
  while$
}

FUNCTION {sort.format.title}
{ 't :=
  "A " #2
    "An " #3
      "The " #4 t chop.word
    chop.word
  chop.word
  sortify
  #1 global.max$ substring$
}

FUNCTION {author.sort}
{ author empty$
    { key empty$
        { "to sort, need author or key in " cite$ * warning$
          ""
        }
        { key sortify }
      if$
    }
    { author sort.format.names }
  if$
}

FUNCTION {author.editor.sort}
{ author empty$
    { editor empty$
        { key empty$
            { "to sort, need author, editor, or key in " cite$ * warning$
              ""
            }
            { key sortify }
          if$
        }
        { editor sort.format.names }
      if$
    }
    { author sort.format.names }
```

```
  if$
}

FUNCTION {author.organization.sort}
{ author empty$
    { organization empty$
        { key empty$
            { "to sort, need author, organization, or key in " cite$ * warning$
              ""
            }
            { key sortify }
          if$
        }
        { "The " #4 organization chop.word sortify }
      if$
    }
    { author sort.format.names }
  if$
}

FUNCTION {editor.organization.sort}
{ editor empty$
    { organization empty$
        { key empty$
            { "to sort, need editor, organization, or key in " cite$ * warning$
              ""
            }
            { key sortify }
          if$
        }
        { "The " #4 organization chop.word sortify }
      if$
    }
    { editor sort.format.names }
  if$
}

FUNCTION {presort}
{ calc.label
  label sortify
  "    "
  *
  type$ "book" =
  type$ "inbook" =
  or
    'author.editor.sort
    { type$ "proceedings" =
        'editor.organization.sort
        { type$ "manual" =
            'author.organization.sort
            'author.sort
          if$
        }
      if$
```

```
    }
  if$
  "    "
  *
  year field.or.null sortify
  *
  "    "
  *
  title field.or.null
  sort.format.title
  *
  #1 entry.max$ substring$
  'sort.label :=
  sort.label *
  #1 entry.max$ substring$
  'sort.key$ :=
}

ITERATE {presort}

SORT

STRINGS { longest.label last.label next.extra }

INTEGERS { longest.label.width last.extra.num number.label }

FUNCTION {initialize.longest.label}
{ "" 'longest.label :=
  #0 int.to.chr$ 'last.label :=
  "" 'next.extra :=
  #0 'longest.label.width :=
  #0 'last.extra.num :=
  #0 'number.label :=
}

FUNCTION {forward.pass}
{ last.label label =
    { last.extra.num #1 + 'last.extra.num :=
      last.extra.num int.to.chr$ 'extra.label :=
    }
    { "a" chr.to.int$ 'last.extra.num :=
      "" 'extra.label :=
      label 'last.label :=
    }
  if$
  number.label #1 + 'number.label :=
}

FUNCTION {reverse.pass}
{ next.extra "b" =
    { "a" 'extra.label := }
    'skip$
  if$
  extra.label 'next.extra :=
```

```
  extra.label
  duplicate$ empty$
    'skip$
    { "{\natexlab{" swap$ * "}}" * }
  if$
  'extra.label :=
  label extra.label * 'label :=
}

EXECUTE {initialize.longest.label}

ITERATE {forward.pass}

REVERSE {reverse.pass}

FUNCTION {bib.sort.order}
{ sort.label  'sort.key$ :=
}

ITERATE {bib.sort.order}

SORT

FUNCTION {begin.bib}
{   preamble$ empty$
    'skip$
    { preamble$ write$ newline$ }
  if$
  "\begin{thebibliography}{" number.label int.to.str$ * "}" *
  write$ newline$
  "\expandafter\ifx\csname natexlab\endcsname\relax\def\natexlab#1{#1}\fi"
  write$ newline$
  "\expandafter\ifx\csname url\endcsname\relax" write$ newline$
  "  \def\url#1{{\tt #1}}\fi" write$ newline$
}

EXECUTE {begin.bib}

EXECUTE {init.state.consts}

ITERATE {call.type$}

FUNCTION {end.bib}
{ newline$
  "\end{thebibliography}" write$ newline$
}

EXECUTE {end.bib}
```
⟨/bst⟩

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