Writing M. Tech Dissertations in LaTeX 2ε

A Dissertation Submitted to the University of Hyderabad
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in
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by

Chakravarthy Bhagvati
86MCMT06

School of Computer and Information Sciences
University of Hyderabad
Gachibowli, Hyderabad - 500 046
Telangana, India

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CERTIFICATE

This is to certify that the dissertation titled, "**Writing M. Tech Dissertations in LaTeX 2$_\epsilon$**" submitted by **Chakravarthy Bhagvati**, bearing Regd. No. **86MCMT06**, in partial fulfillment of the requirements for the award of Master of Technology in Computer Science is a bonafide work carried out by him under my supervision and guidance.

The dissertation has not been submitted previously in part or in full to this or any other University or Institution for the award of any degree or diploma.

Prof. S.U.Pervisor
Project Supervisor
School of Computer and
Infomration Sciences
University of Hyderabad.

Prof. D.E. Anscis
Dean
School of Computer and
Information Sciences
University of Hyderabad.

DECLARATION

I, **Chakravarthy Bhagvati**, hereby declare that this dissertation titled, "**Writing M. Tech Dissertations in LaTeX2ε**", submitted by me under the guidance and supervision of Prof. S.U.Pervisor is a bonafide work which is also free from plagiarism. I also declare that it has not been submitted previously in part or in full to this University or other University or Institution for the award of any degree or diploma. I hereby agree that my dissertation can be deposited in Shodganga/INFLIBNET.

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Date:

Name: Chakravarthy Bhagvati
Regd. No. 86MCMT06

//Countersigned//

Signature of the Supervisor(s):

(Prof. S.U.Pervisor)

Acknowledgments

Abstract

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Chapter 1

Introduction to the LaTeX Philosophy

This document is a brief tutorial for getting started with LaTeX for writing M. Tech dissertations here in the university. It covers the essential aspects for writing the dissertations and is by no means exhaustive.

LaTeX (or more precisely, LaTeX 2_ε) is a professional typesetting package for producing high-quality documents especially of a technical nature. Today, almost all the documents and books published by major publishing houses such as Elsevier, Pearson, Academic Press, etc. are typeset in LaTeX. Somewhat interestingly, Thiruvananthapuram (Trivandrum) in Kerala has become a hub for LaTeX where several publishing houses have set up shop to have various publications typeset in LaTeX.

Publishing any document has two phases: a writing phase and a publishing phase. In the writing phase, an author produces the *content* such as a technical report, a thesis or a dissertation. The writing phase thus deals with the *logical* aspects of writing, i.e., the titles, headings and sub-headings, graphics, equations, etc. In the publishing phase, a given content is *converted into print*. The key objective is to ensure that the printed end-product is pleasing to the eye while allowing easy identification of the different logical aspects. Expertise in understanding the appearances of fonts and their relationships, white spaces, the usage of different styles and sizes, placement of the different logical objects and many more esoteric aspects such as kerning, serifs, etc. are required in this phase. The main point to recognise is that the expertise required for these two phases is almost disjoint and neither an author nor a publisher has the necessary skills to produce a document.

A typesetting package, unlike a typcial desktop publishing package (DTP) such as

MS-WORD, recognises these two separate phases. A document processing package does not really distinguish between the two phases and the author also becomes the publisher. *That* precisely is the problem in using such packages to produce professional documents. LaTeX recognises this problem and keeps the two phases separate. The author writes the *content* with directions to the publisher on its logical aspects such as titles, headings, chapters, emphases, equations, etc. These activities are done by a set of *commands* that markup the source text with logical entities. The publisher aspect is achieved by *running* the LaTeX command after the source file containing the content is fully written with the necessary markups. Running the command, in turn, renders these directions according the rules of publishing (i.e., *typesetting*) and produces a beautiful document in either a *device-independent* (DVI) or more commonly *PDF*.

Chapter 2

Structure of a LaTeX 2ε Document

All LaTeX 2ε documents contain two parts: the preamble and the contents. In turn, the preamble contains *commands* to the printer and they are inserted using a '\' (see examples below). The typical format of a command is

`\<command name>[optional args]<{arg1,arg2,…}>`

Preamble (and therefore the document) begins with a `\documentclass` command. Its optional arguments specify many attributes such as the page size and text font size. An example is shown below in Section 3.1. The required argument specifies the type of the document which can be one of `article, report, book` or `letter`. Some of the things specified in the preamble are: margins, page numbering styles, interline spacing, fonts, etc. Any text without the \ is treated as regular content and sent as is to the printer.

The contents begin, thus ending the preamble section, with a

`\begin{document}`

command. In a completely expected manner, the contents (and therefore the document) end with an

`\end{document}`

command. The contents section contains the actual text for printing.

The entire process of producing documents with LaTeX 2ε is illustrated with M. Tech Dissertation as an example.

Chapter 3

M. Tech Dissertation

An M. Tech dissertation consists of four main parts:

1. *Front Matter* containing the title, certificate and declaration

2. *Forward Section* containing the abstract, acknowledgments, table of contents, lists of figures and tables and any other sections such as terminology, etc.

3. *Main Matter* containing the actual contents

4. *References* or *Bibliography*

The Front Matter is fixed in format and the content is also largely common to all dissertations. The variable matter consists of the student details, title, school/department and the year of submission.

The Forward section, strangely enough, can only be created after the rest of the document! A large part of it, tables of contents, tables and figures, and terminology can be automatically created by LaTeX 2_ε. We will see this in Section 3.3.

The Main Matter section is written by the author. The major commands needed here are for marking up the text for emphasis or for some other purpose. A second set of commands are needed for inserting graphical objects and tables. The last set of commands are needed for specifying mathematical equations and derivations. These are all explained in Sections 3.2–3.5.

References and Bibliography along with cross-referencing can be automatically generated by LaTeX 2_ε and you are better off doing just that! LaTeX 2_ε maintains all the

references far better than you can and it makes no mistakes. Section 3.5 tells you how to generate references and create a bibliography.

3.1 Dissertation Preamble

Any LaTeX 2$_\varepsilon$ document begins with the preamble and the documentclass command. For an M. Tech dissertation, the document type is **book** and the page layout is **A4 size, portrait orientation, single column and double sided text in 12pt font**. This is specified as

```
\documentclass[12pt,a4paper,twoside]{book}
```

The others are the default for a `book`.

The next thing to do is tell LaTeX 2$_\varepsilon$ that this is an M. Tech dissertation by typing

```
\usepackage{mtdissertation}
```

It provides commands for generating the dissertation-specific objects easily. Some of the dissertation specific parameters are the margins, line spacing, facilities for including figures, tables, mathematics, algorithms, etc. Normally, we need to specify each of them in the preamble, but the package `mtdissertation` takes care of many of them. We need a left margin of 1.5 inches and the other three of 1 inch each. M. Tech theses also need 1.5 line spacing. Both these are specified from the `mtdissertation` package. We do not need to do anything.

Most M. Tech dissertations contains figures, drawings, images and such graphical objects. To allow such objects to be specified, we need the following in the preamble.

```
\usepackage{graphicx}
```

Many Computer Science dissertations also contain *algorithms* and these can be formatted beautifully using the `algorithmic` package. The `algorithmic` package is used with another package called `algorithm2e`. Both of them are specified in the preamble (see Figure3.1). They are specified as

```
\usepackage{algorithm2e}
```

followed by

```
\usepackage{algorithmic}
```

`\mtdissertation` package provides special commands to make the Front Matter

section (See Section 3.3) easy to produce. Use the following to provide the necessary information about the student, thesis and supervisor.

- Title of the thesis as `\title{<title of the thesis>}`
- Name of the student as `\author{<name of the student>}`
- Student's Roll Number as `\rollnum{<Roll No>}`
- Stream (i.e., Computer Science, Artificial Intelligence, Information Technology) as `\subject{<stream>}`
- Supervisor name as `\supervisor{<Name of the Supervisor>}`
- Head/Dean name as `\dean{<Name of Head/Dean>}`

There are other directives that may be in the preamble such as those that allow switching between *portrait* and *landscape* modes, fancy tables and others. You can see examples and tutorials by searching the Internet.

Finally, all that we have talked about are summarised in Figure 3.1.

```
\documentclass[12pt,a4paper,twoside]{book}
\usepackage{mtdissertation}
\usepackage{graphicx}
\usepackage[ruled,vlined]{algorithm2e}
\usepackage{algorithmic}
\title{<Title of the dissertation>}
\author{<Name of the student>}
\rollnum{<Roll Number of the student>}
\subject{<Stream>}
\supervisor{<Name of the supervisor>}
\dean{<Name of the Head/Dean>}
```

Figure 3.1: A typical dissertation preamble

3.2 Dissertation Contents

Everything in M. Tech dissertation becomes the contents part of a LaTeX 2_ε document. So, it begins with `\begin{document}` command. Front Matter, Forward Section, Main Matter and References come one after the other. Finally, the document ends with `\end{document}` command.

3.3 Front Matter and Forward Section

The Front Matter and Forward Sections are relatively easy as they are in a fixed format and contain the following:

1. title page with the university logo
2. certificate by the supervisor and the head/dean
3. declaration by the student
4. dedication, if any, and acknowledgments
5. abstract
6. table of contents
7. list of figures
8. list of tables

Use `\mtdfrontmatter` to generate the title page, certificate and declaration. Information provided in the preamble about the author, title and others is automatically used in generating these pages.

Write the *Acknowledgments* and *Abstract* sections using the information in Section 3.4.

Generate the *Table of Contents* and other lists by using
`\mtdcontents`
command. With this, we are done with the *Front Matter and Forward* sections.

3.4 Main Matter

This is the text containing description of the work done by the student. It typically consists of several chapters beginning with *Introduction* and ending with *Conclusions*. The main commands and guidelines needed for writing the contents are listed below. These same commands and instructions may also be used to write *Acknowledgments* and *Abstract* sections. **Only make sure that you write these sections** *before* **using `\mtdcontents` command.**

Type the text that you want. There are only two rules to remember about such plain text. The first, the space between words is determined by LaTeX 2_ε. You can type words with one or more spaces between them but the actual spacing in the output has no link to the spaces you put in your text. For example, `this work` is the same as `this work` in the output. The second, leaving a blank line between sentences is taken as a paragraph break. Again, one or more blank lines do not matter. They will be taken as a *single* paragraph break.

The following commands are common for marking up text.

- Chapter titles are given by `\chapter{<Name of the chapter>}`

- Each chapter can have many sections (`\section{<Name of the Section>}`), sub-sections (`\subsection{<Name of the Subsection>}`) and even sub-sub-sections. They will be formatted automatically. Examples may be seen within this document itself.

- **Boldface text** is produced by `\textbf{<text>}` while *italicised text* is produced by `\emph{<text>}` where *emph* stands for *emphasis*. For special occasions, you can even use SMALL CAPITALS with `\textsc{<text>}`.

Three types of lists are also available. The first is an *ordered* list with numbered items given by

```
\begin{enumerate}
\item   Item 1
\item   Item 2
     ...
\item   Item N
\end{enumerate}
```

1. Item 1
2. Item 2

   …

N. Item N

The output is shown on the right side.

An *unordered* list is produced the same way but "enumerate" is changed to *itemize*. A '•' is used in place of numbers to give a *bulleted* list. The third kind of list is *description*. In this, each item is listed with a specified word in boldface. For example,

```
\begin{description}
\item[Helicopter shot]   A shot
   popularised by M.S.Dhoni
   that \ldots
\item[Dilscoop]   A crazy shot
  ``invented'' by Dilshan \ldots

     \ldots
\item[Doosra]   A ball from an
   off-spin bowler that \ldots
\end{description}
```

Helicopter shot A shot popularised by M.S.Dhoni that …

Dilscoop A crazy shot "invented" by Dilshan …

…

Doosra A ball from an off-spin bowler that …

The output is shown on the right side. Note that the word to be described is given in square brackets with the `\item` command inside the `\begin{description}` and `\end{description}` region. Such regions enclosed by `\begin{}` – `\end{}` pairs are called *environments* in LaTeX 2_ε.

3.4.1 Equations and Mathematics

The real power and beauty of LaTeX 2_ε lies its ability to format mathematical expressions. You need to refer to manuals for writing mathematics and this section gives only the outline.

There are three types of equations.

In-line: These expressions are a part of the running text such as, "let us consider a second degree polynomial $ax^2 + bx + c$." Such equations are typed as `$ax^2+bx+c$`. Any expression that starts with a `$` and ends with another `$` is formatted as a mathematical expression.

Equations: The second type of an expression is a more complex equation that should appear on a line by itself. This is achieved using either `\begin{equation}` and `\end{equation}` or `\[` and `\]`. The former automatically gives a numbered equation while the latter does not number it. For example,

`\begin{equation}ax^2+bx+c=0\end{equation}` produces

$$ax^2 + bx + c = 0 \tag{3.1}$$

In a similar vein, typing `\[ax^2+bx+c=0\]` produces

$$ax^2 + bx + c = 0$$

Note that the only difference is that the equation is not numbered in this case. The equation is numbered automatically according to the chapter number in the first case.

Multiline Equations: Sometimes, there is a need to type in a series of equations. This is done by using `eqnarray`.

```
\begin{eqnarray}
    4x^2 + 13x - 48 & = & 0   \\
    \Rightarrow 4x^2 + 16x - 3x - 48 & = & 0   \\
    \Rightarrow 4x (x - 3) + 16 (x - 3) & = & 0   \\
    \Rightarrow (4x + 16)(x - 3) & = & 0
\end{eqnarray}
```

The above produces the following output.

$$\begin{aligned} 4x^2 + 13x - 12 &= 0 && (3.2)\\ \Rightarrow 4x^2 + 16x - 3x - 12 &= 0 && (3.3)\\ \Rightarrow 4x(x + 4) - 3(x + 4) &= 0 && (3.4)\\ \Rightarrow (4x - 3)(x + 4) &= 0 && (3.5) \end{aligned}$$

The '&'s are used to tell LaTeX 2_ε where to align the equations. All the text before the & is treated as a *column*, the text before the next & as the second column and the rest after the second & as the third and last column. The \\ is used for ending an equation. Note how each of the equations is numbered automatically.

If you do not want the numbering, use

`\begin{eqnarray*}`

and

`\end{eqnarray*}`

"*" is *universally used to turn off numbering*. It can be used with `\section` and `\subsection`, `\equation` and any other command that generates automatic numbering.

> Enhanced and very high quality mathematics can be obtained with other packages such as `amsmath, amssymb` and others. Also, many believe that `eqnarray` is not very good for typesetting multiline equations.
> **Please read the full LaTeX 2ε manuals or the online tutorials for a full treatment of mathematics.**

3.4.2 Figures, Tables and Algorithms

The last major contents of the main matter are *figures* and *tables*. Figures and Tables are automatically numbered the same way that equations are. Figures are used to insert graphical objects such as drawings and photographs. Algorithms are a bit more complicated and will be shown at the end of the section.

```
\begin{figure}[thb]
\includegraphics[width=7cm]{figure1.eps}
\caption{Helicopter Shot in action!}
\end{figure}
```

The above piece of code shows how a figure is inserted into a LaTeX 2ε document. There are several important things to note about putting in figures.

- LaTeX 2ε generally allows only *Encapsulated PostScript* format i.e. files with `.eps` extension. These usually are of a very high quality compared to other formats such as JPEG, BMP or PNG. Almost all Linux graphics packages export pictures in EPS format.

  For high quality figures, use only EPS in your dissertation!

- The text in `\caption` is formatted according to the document type and numbered as **Figure 1, Figure 2**, etc.

- The placement of the figure in the document is controlled by LaTeX 2_ε and sometimes it is so stubborn that it borders on the pig-headed! The figure is *not* placed in the text as it is located in the source file. It is placed at a location that LaTeX 2_ε thinks is the optimal place. The writer is allowed to suggest a location using the *letters 't', 'h' and 'b' in square brackets after the* `\begin{figure}` command. They indicate 'top', 'here' and 'bottom' respectively. Normally, the figure is placed either at the top or the bottom of a page but can be placed at any location using the 'h' option. Again, 'h' option is only a *request* to LaTeX 2_ε and it can move the figure to a location that it thinks is better!

The same description works for *tables* too except that they use
`\begin{table}`
and
`\end{table}`
commands. When a caption is written, it is numbered separately from figures as **Table 1, Table 2**, etc.

Algorithms are more complicated and are provided by many LaTeX packages. The one discussed here is from the `algorithmic` package (remember that you put in `\usepackage{algori` in the preamble). An example is shown and you can use the Internet to know further.

```
\begin{algorithm}[hbt]
\caption{$MIDS(X = (X^\bullet, X^\times), Y^\bullet)$}
\begin{algorithmic}[]
\STATE $Y^\bullet := \phi$
\FOR {$B \in \mathcal{B}$}
\STATE $Z_B := \epsilon_B^\bullet(X^\times)$
\FOR {$v \in Z_B$}
\IF {$B_v \not\subset X$}
\STATE \textbf{continue}
\ENDIF
\STATE $Y^\bullet := Y^\bullet \cup v$
```

```
\STATE $\alpha_{B_v}(X^\times) = \delta^\times_{B_v}
              \circ \epsilon^\bullet_{B_v}$
\STATE $\beta_{B_v}(X) = (\delta^\bullet
              \circ \alpha_{B_v}(X), \Delta
              \circ \alpha_{B_v}(X)
)$
\STATE $X = \psi_{B_v}(X) = (X \setminus
              \beta_{B_v}(X) = (X^\bullet
              \setminus \delta^\bullet \circ
              \alpha_{B_v}(X), X^\times \setminus
              \Delta \circ \alpha_{B_v}(X))$
\STATE $Z_B := Z_B \cap X^\bullet$
\ENDFOR
\ENDFOR
\end{algorithmic}
\end{algorithm}
```

It produces the output shown in Algorithm 1.

Algorithm 1: $MIDS(X = (X^\bullet, X^\times), Y^\bullet)$

$Y^\bullet := \phi$
for $B \in \mathcal{B}$ **do**
  $Z_B := \epsilon^\bullet_B(X^\times)$
  for $v \in Z_B$ **do**
    if $B_v \not\subset X$ **then**
      continue
    end if
    $Y^\bullet := Y^\bullet \cup v$
    $\alpha_{B_v}(X^\times) = \delta^\times_{B_v} \circ \epsilon^\bullet_{B_v}$
    $\beta_{B_v}(X) = (\delta^\bullet \circ \alpha_{B_v}(X), \Delta \circ \alpha_{B_v}(X))$
    $X = \psi_{B_v}(X) = (X \setminus \beta_{B_v}(X) = (X^\bullet \setminus \delta^\bullet t \circ \alpha_{B_v}(X), X^\times \setminus \Delta \circ \alpha_{B_v}(X))$
    $Z_B := Z_B \cap X^\bullet$
  end for
end for

3.4.3 Organising your Document

There is no need to create a giant and possibly unmanageable text file containing all the chapters, sections, figures, bibliography, the kitchen sink, the floor tiles, etc. LaTeX 2ε allows you to split the input across many separate files and combine them to produce the full document. A common way to organise the files is to have a separate file for each chapter such as `chapter1.tex, chapter2.tex, ...chapterN.tex`. The entire preamble, the

`\begin{document}`

and the

`\end{document}`

commands can be put in a main file, say we call it `dissertation.tex`. You can use

`\input{filename}`

command to ask LaTeX 2ε to read in the matter from the file name given as the argument. Thus, the entire dissertation may be kept in one main file, `dissertation.tex` and several contents files, `chapters`.tex.

The file `dissertation.tex` may now contain:

…
PREAMBLE
`\begin{document}`
FRONT MATTER AND FORWARD SECTIONS
`\input{chapter1}`
`\input{chapter2}`
…
`\input{chapterN}`
`\end{document}`

Notice that the extension `.tex` is not necessary within the `\input` command.

3.5 Cross References and Citations

One of the biggest problems in writing large documents is the need to maintain references to various items in the text. For example, you may want to refer to the section

on Front Matter here and give its section number or page number to the reader. For example, we may wish to write

"The contents of the Front Matter (see Section 3.3) are on Page 8."

The obvious (and *incorrect*) way is to type in the numbers painstakingly. There are two great problems with such an approach: if text is added or deleted, the numbers may change and, there may be several references to the same object and we have to make changes at a number of places. LaTeX 2_ε provides a much better solution. The output above is actually produced by the following text in the source file.

```
``The contents of the Front Matter (see Section
\ref{sect:front}) are on Page \pageref{sect:front}.''
```

Note the commands `\ref` and `\pageref`. The former automatically generates a Chapter, Section, Subsection, Equation, Table or a Figure number while the latter produces a page number. The arguments to both these commands is a *key*. The key is the link for cross-linking in LaTeX 2_ε. First, a key is defined for the element that will be referred using the `\label` command. `\label` command is used *at the page or the element to which a reference will be made by* `\ref` and `\pageref` commands. In the above example, the key `{sect:front}` is defined by the command
`\label{sect:front}`
immediately after the `\section{Front Matter}` command as shown below:

```
\section{Front Matter and Forward Section}
\label{sect:front}
The Front Matter and Forward Section is relatively easy
as it is in a ...
```

This causes the key `\sect:front` to be associated with the corresponding section and page numbers. It can be referenced anywhere, either before or after, in the document using `\ref` and `\pageref` commands and will be resolved correctly each time.

Finally, let us deal with referring to *citations*, i.e., references to published articles, journals, books, etc. by others. There are two parts to *citing* others' work. The first is the *reference* in the text. For example,

> Many methods exists for solving such problems[1]. One of the most famous is the *foobar* algorithm proposed by F. Bar and S. N. Afu[2].

Note how the references are typeset in square brackets with numbers. This is achieved by the `\cite{<ref-key>}` command. The above text is produced by

```
Many methods exists for solving such problems\cite{r1}.
One of the most famous is the \emph{foobar} algorithm
proposed by F. Bar and S. N. Afu\cite{r2}.
```

`r1` and `r2` are the *key*s and play the same role as in cross-referencing with the `\label` command.

The second part of citations is the *Bibliography* chapter at the end of the dissertation. Once the entire dissertation is written (that is, all the chapters are done), use `thebibliography` environment. This is like the `description` environment described earlier. For the two references given above,

```
\begin{thebibliography}{00}
\bibitem{r1}
W. E. R. Everything.
"A Comparison of the Algorithms of Everything",
\emph{Int. J. of Algorithmic Computing},
Vol. 45(7), 2012.

\bibitem{r2}
F. Bar and S. N. Afu.
"The FooBar Algorithm: A New Paradigm in Problem Solving",
\emph{ACM J. of Communications},
Vol. 235 (12), 2009.
\end{thebibliography}
```

Note the `{00}` after `\begin{thebibliography}` command. This indicates that the number of references is less than 100.

Using the `key` argument of `\bibitem` command, the references are automatically cross-linked by LaTeX 2_ε to the corresponding `\cite` commands. You can see the Bibliography chapter in this document if you need an example.

LaTeX 2$_\varepsilon$ provides very powerful features for Bibliography and what is presented here is only the tiniest fraction. You should search the Internet for more information, especially about the different bibliographic styles and *bibtex*.

Once you are done with bibliography, you can type
`\end{document}`
command, save the file and prepare to *generate the document* for printing.

Just to summarise all that is said, look at Figure 3.2 for what a LaTeX 2$_\varepsilon$ M. Tech Dissertation source could be.

```
\documentclass[12pt,a4paper,twoside]{book}
\usepackage{mtdissertation}
\usepackage{graphicx}
\usepackage[ruled,vlined]{algorithm2e}
\usepackage{algorithmic}
\title{<Title of the dissertation>}
\author{<Name of the student>}
\rollnum{<Roll Number of the student>}
\subject{<Stream>}
\supervisor{<Name of the supervisor>}
\dean{<Name of the Head/Dean>}
%%%%%%%%%%%%%%%%%%%%%%%%
\begin{document}
\mtdfrontmatter
\include{acknowledgment}
\include{abstract}
\mtdcontents

\include{chapter1}
\include{chapter2}
\include{chapter3}
  ...
\begin{thebibliography}{00}
\bibitem{one}
  ...
\bibitem{two}
  ...
\end{thebibliography}
\end{document}
```

Figure 3.2: The Structure of a LaTeX 2$_\varepsilon$ Source File for M. Tech Dissertations

3.6 Recommended LaTeX 2ε Resources

Please refer to the following for gaining greater knowledge of LaTeX 2ε and friends.

LaTeX 2ε Tutorial Online Tutorials for LaTeX 2ε: Indian TeX Users Group, URL http://www.tug.org.in/tutorials.html

LaTeX Tutorial in PDF LaTeX Tutorials — A Primer — TUG, URL https://www.tug.org/twg/mactex/tutorials/ltxprimer-1.0.pdf

LaTeX 2ε Cheat Sheet URL http://www.stdout.org/ winston/latex/latexsheet.pdf

TeX Users Group URL http://www.tug.org

The Ultimate Source Comprehensive TeX Archive Network, URL http://www.ctan.org

Chapter 4

Generating Documents

The authoring is done using all the information provided in the previous sections. The second part of the document generation is *publishing* or *printing*. This is done as follows in a Linux system from a terminal.

1. Open a terminal and change into the directory containing the saved LaTeX 2$_\varepsilon$ source file. It should be something like `foo.tex`

2. Type
   `xelatex foo.tex`
   to generate output in PDF.

   If there are errors, correct them in the `foo.tex` file (isn't this like compiling and running your programs?!)

   You may have to run the latex command twice (and, in unusual circumstances, thrice) to resolve all the cross-references and citations.

There should be file `foo.pdf` if all is well and you are ready to print or run to the supervisor for comments!

Bibliography

[1] W. E. R. Everything. "A Comparison of the Algorithms of Everything", *Int. J. of Algorithmic Computing*, Vol. 45(7), 2012.

[2] F. Bar and S. N. Afu. "The FooBar Algorithm: A New Paradigm in Problem Solving", *ACM J. of Communications*, Vol. 235 (12), 2009.