Another Short Tutorial for LaTeX 2_ε

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Contents

1 Introduction

This is a short, easy, nontechnical introduction to LaTeX 2ε. It's a tutorial designed for students who do not have a lot of time, who do not need to become overnight experts in LaTeX 2ε, and prefer a shallow learning curve to a boot camp approach. After you have worked through it, you will be able to create professional documents, and have the ability to teach yourself how to extend your LaTeX 2ε skills — to become a LaTeX 2ε guru if you want to or need to.

What about LaTeX 2ε? First, it's *free* in the sense that you do not have to pay for it. Second, it's *easy*, given that you know how to use it. As always, there are trade-offs, and "easy" to an expert tends to be hard for a beginner, and *vice versa*. Third, it's *stable*, the first version released in 1985. Fourth, it's *well documented*, not surprising since its purpose is document preparation. Fifth, it's *professioal*, as you will soon come to see. I will touch on these points from time to time in this tutorial.

How does this introduction work? Each "lesson" consists of the introduction of a few commands, some text to copy, paste, and compile, and a couple of questions. Ech lesson should not take more than fifteen minutes to complete. It uses the "baby talk" principle — you imitate what you see and explore it by making slight changes. If you complete one lesson a day, within several weeks you will have a good foundation with LaTeX 2ε, and begin to create professional quality documents. You will also see how the things I wrote in the preceding paragraph are true.

2 Document Basics

A `tex` document consists of plain text, and special characters, commands, and environments. I will generally refer to special characters, commands, and enviormments with the word *commands*; you don't need to know the difference between them now, but you shortly will without being told. You *must* precede commands with a backslash (\) for the compiler to know that they are commands. This is easy to forget, so I will remind you the first couple of times.

What should I have? You should have a working LaTeX 2_ε program. If you do not have one, see Appendix A below. You will also need a text editor, and you will probably want to get an integrated editor, compiler, and printer. See Appendix B. You can also use the old fashioned command line, I cover this in Appendix C.

2.1 Basic document

- documentclass
- begin/end document
- plain text
- comments

A basic document begins with a document class, and has a preamble and contents. Type (or copy) the following, save it as a `.tex` document and compile it. The percent signs (%) are comments and do not have any effect on the document.

```
\documentclass{article}
    %this is the preamble
\begin{document}
    %this is the contents section
    It works! %plain text prints as it
\end{document}
```

Exercise: LaTeX 2_ε has a number of different document classes. Name four of them.

Exercise: A `documentclass` command can take optional arguments, like this: `documentclass[optional arguments]{document class}`.[1] Name two optional arguments.

[1] Don't forget to type a backslash before the command, like this: `\documentclass`

2.2 Basic title

- title
- author
- date
- maketitle

A basic document usually has a title and author information ib the preamble. Create and compile a second document like this:

```
\documentclass{article}
    \title{Title, Author, and Date}
    \author{Charles Carter}
    \date{July 4, 1776}
\begin{document}
    \maketitle{}
    This document has a title, author, and date.
\end{document}
```

Exercise: What happens if you use the command `today{}`[2] as the date parameter (replacing July 4, 1776)?

Exercise: What happens if you use the command `thanks{email address}`[3] after your name in the `author{}` command?

2.3 Basic sections

- section
- subsection
- subsubsection
- label

LaTeX 2_ε provides a number of useful section levels, including part and chapter. Two of the most useful are `section` and `subsection`. Create and compile the following document.

The `label{}` is used to create cross-references in documents. It's also very helpful in organizing your thoughts. The argument to `label{argument}` does not appear

[2] Remember, `\date{}`
[3] `\thanks{}`

in the document. I cover the `ref` and `pageref` commands below in subsection 4.1 on page 22. These are used to create references back to the label.

```
\documentclass{article}
    \title{Basic Sections}
    \author{Charles Carter}
    \date{\today{}}
\begin{document}
    \maketitle{}
    \section{Introduction}
    \label{Introduction}
    \section{Body}
    \label{Body}
    \section{Conclusion}
    \label{Conclusion}
\end{document}
```

Exercise: What do the commands `subsection{}` and `subsubsection{}` do?

Exercise: What does `section*{}` do? Note the asterisk (*) after `section`. You can also use this starred version for `subsections` and `subsubsections`.

2.4 Basic paragraphs

- paragraph
- subparagraph

We have reached the point where you need some real content. I will use the text of Abraham Lincoln's Gettysburg Address to illustrate paragraphs. Notice that ordinary paragraphs do not need a special commend – the "paragraph command" is simply two blank lines to create an empty new line between the paragraphs, as if they were double spaced. Create and compile the following document.

```
\documentclass{article}
    \title{Basic Paragraphs}
    \author{Charles Carter}
    \date{\today{}}
\begin{document}
    \maketitle{}
    \section{Introduction}
    \label{Introduction}
    \section{Body}
    \label{Body}

Four score and seven years ago our fathers brought forth on this
continent a new nation, conceived in liberty, and dedicated to
```

```
the proposition that all men are created equal.

Now we are engaged in a great civil war, testing whether that nation,
or any nation so conceived and so dedicated, can long endure. We
are met on a great battlefield of that war. We have come to dedicate
a portion of that field, as a final resting place for those who here
gave their lives that that nation might live. It is altogether fitting
and proper that we should do this.

But, in a larger sense, we can not dedicate, we can not consecrate,
we can not hallow this ground. The brave men, living and dead, who
struggled here, have consecrated it, far above our poor power to add
or detract. The world will little note, nor long remember what we say
here, but it can never forget what they did here. It is for us the
living, rather, to be dedicated here to the unfinished work which they
who fought here have thus far so nobly advanced. It is rather for us
to be here dedicated to the great task remaining before us, that from
these honored dead we take increased devotion to that cause for which
they gave the last full measure of devotion, that we here highly resolve
that these dead shall not have died in vain, that this nation, under
God, shall have a new birth of freedom, and that government of the people,
by the people, for the people, shall not perish from the earth.

    \section{Conclusion}
    \label{Conclusion}
\end{document}
```

Exercise: What happens if you include the `paragraph{}` or `subparagraph{}` commands before each paragraph?

Exercise: What happens if you include arguments with the `paragraph{argument}` or `subparagraph{argument}` commands?

2.5 Basic packages

- usepackage
- lipsum

Much of LaTeX 2_ε functionality is contained in external packages. To use this functionality, you include the command `usepackage{}` in the preamble. Of course, you first have to install the package on your computer, but the MiKTeX distribution does that automatically. The `lipsum` package generates generic text (in Latin, of course). The `lipsum{}` command generates text. Notice that you can control the number of paragraphs to include. Below, I hgave included paragraph 1 in the introduction, paragraphs 2 through 4 in the body, and paragraph 5 in the conclusion.

Notice the paragraph indentation. First paragraphs are *not* indented. Following paragraphs *are* indented. This is normal typographic practice.

```
\documentclass{article}
    \usepackage{lipsum}
    \title{Using Packages}
    \author{Charles Carter}
    \date{\today{}}
\begin{document}
    \maketitle{}
    \section{Introduction}
    \label{Introduction}
        \lipsum[1]{}
    \section{Body}
    \label{Body}
        \lipsum[2-4]{}
    \section{Conclusion}
    \label{Conclusion}
        \lipsum[5]{}
\end{document}
```

Exercise: What is CTAN, the Comprehensive TEX Archive Network? How many packages are currently on CTAN?

Exercise: What are the most popular LATEX 2_ε packages?

2.6 Basic contents

- tableofcontents

Creating a table of contents is easy. Just include the `tableofcontents{}` command. You may have to compile the document twice to ensure that the table of contents is generated properly.

```
\documentclass{article}
    \usepackage{lipsum}
    \title{Table of Contents}
    \author{Charles Carter}
    \date{\today{}}
\begin{document}
    \maketitle{}
    \tableofcontents{}
    \section{Introduction}
    \label{Introduction}
        \lipsum[1]{}
    \section{Body}
    \label{Body}
```

```
        \lipsum[2-4]{}
    \section{Conclusion}
    \label{Conclusion}
        \lipsum[5]{}
\end{document}
```

Exercise: The `section[argument]{Section Title}` command takes an optional argument. How does this argument affect the table of contents?

Exercise: What other kinds of content tables can LaTeX 2$_\varepsilon$ generate? To start with, look at figures and tables.

2.7 Basic decorations

- textit
- textsf
- texttt
- textbf
- textsc
- underline

In this section, you will fiddle with the appearance of text. To *create text in italics*, use `textit`. To create text in sans serif, use `textsf`. To `create text in monospace font`, use `texttt`. To **create text in boldface**, use `textbf`. To CREATE TEXT USING SMALL CAPS, use `textsc`. You should almost never underline text! If you choose to do so, use `underline`.

To *create text in italics*, use `textit`.

To create text in sans serif, use `textsf`.

To `create text in monospace font`, use `texttt`.

To **create text in boldface**, use `textbf`.

To CREATE TEXT USING SMALL CAPS, use `textsc`.

You should almost never underline text! If you choose to do so, use `underline`.

```
\documentclass{article}
    \title{Font Appearance}
    \author{Charles Carter}
```

```
    \date{\today{}}
\begin{document}
    \maketitle{}
    \section{Introduction}
    \label{Introduction}
    \section{Body}
    \label{Body}
        \paragraph{}In this section, you will fiddle with the appearance of text.
        \paragraph{}To \textit{create text in italics}, use \texttt{textit}.
        \paragraph{}To \textsf{create text in sans serif}, use \texttt{textsf}.
        \paragraph{}To \texttt{create text in monospace font}, use \texttt{texttt}.
        \paragraph{}To \textbf{create text in boldface}, use \texttt{textbf}.
        \paragraph{}To \textsc{create text using Small Caps}, use \texttt{textsc}.
        \paragraph{}\underline{You should almost never underline text}!
        If you choose to do so, use \texttt{underline}.
    \section{Conclusion}
    \label{Conclusion}
\end{document}
```

Exercise: As with much else in LaTeX 2$_\varepsilon$,there are multiple ways to italisize or bold-face text. Can you find other ways?

2.8 Basic fontsizes

- tiny
- scriptsize
- footnotesize
- small
- normalsize
- large
- Large
- LARGE
- huge
- Huge

LaTeX 2$_\varepsilon$ has several different ways to alter the size of the font. Perhaps the simplest way is to create a *size environment*. You do this by using one of the commands listed above, and this controls the size of all text until it is changed by another command. You would typically use this for sections of text that need to be made smaller, such as tables, block quotes, technical sections not germane to the main discussion, and similar.

This paragraph has a normalsize font size.

This paragraph has a tiny font size.

This paragraph has a scriptsize font size.

This paragraph has a footnotesize font size.

This paragraph has a small font size.

This paragraph has a normalsize font size.

This paragraph has a large font size.

This paragraph has a Large font size.

This paragraph has a LARGE font size.

This paragraph has a huge font size.

This paragraph has a Huge font size.

This paragraph has a normalsize font size.

```
\documentclass{article}
    \title{Font Sizes}
    \author{Charles Carter}
    \date{\today{}}
\begin{document}
    \maketitle{}
    \section{Introduction}
    \label{Introduction}
    \section{Body}
    \label{Body}
    \normalsize{}\paragraph{}This paragraph has a normalsize font size.
    \tiny{}\paragraph{}This paragraph has a tiny font size.
    \scriptsize{}\paragraph{}This paragraph has a scriptsize font size.
    \footnotesize{}\paragraph{}This paragraph has a footnotesize font size.
    \small{}\paragraph{}This paragraph has a small font size.
    \normalsize{}\paragraph{}This paragraph has a normalsize font size.
```

```
    \large{}\paragraph{}This paragraph has a large font size.
    \Large{}\paragraph{}This paragraph has a Large font size.
    \LARGE{}\paragraph{}This paragraph has a LARGE font size.
    \huge{}\paragraph{}This paragraph has a huge font size.
    \Huge{}\paragraph{}This paragraph has a Huge font size.
    \normalsize{}\paragraph{}This paragraph has a normalsize font size.
    \section{Conclusion}
    \label{Conclusion}
\end{document}
```

Exercise: The issues of font, font size, and font decoration, are difficult, complicated, and subject to internecene wars. You may want to postpone your exploration of these issues until you have created and compiled several hundred `.tex` documents. If you want, and have discretionary time available and nothing else to do, you may want to delve into the complex and divisive world of fonts, font sizes, and font decorations.

LaTeX 2ε is *Professional*

LaTeX 2ε is flexible to an extreme. You can customize every part of your document. However, its authors have spent much time and effort to ensure that it gives a professional appearance "out of the box." This short tutorial does not cover customization. After you have created and compiled several dozen `.tex` files, you will begin to see the need for customization.[4] Unless you have special requirements, such as page margins, paragraph spacing, and page page numbers, and you are happy with the appearance of your document, you do not need to think about customization.

[4]The first thing you may want to do is to change the page margins. An easy way to change page margins is to use the `geometry` package.

3 Math and Symbols

Both TEX and LATEX 2$_\varepsilon$ shine when it comes to math. In fact, Donald Knuth originally wrote TEX just so he could typeset math. In this section, we will dip our toes into math and symbols. This will not be difficult. If you have need for more advanced mathematics, you will know how to find what you need to render your equations.

3.1 Special characters

Most characters are not special. An a is just an a, a Z is just a Z, and a 7 is just a 7. Sometimes, this isn't the case — an & is not just an ampersand. LATEX 2$_\varepsilon$ has ten special characters. They are listed below.

\, %, {, }, $, ^ , _, ~ , #, &

You already lnow four of them. "\" indicates the beginning of a command, "%" indicates a comment, and the "{ - }" pair (usually) indicates the argument to a command. You will learn about three more in this section, "$", "_", and "^". It's worthwhile to stare at these charcters long enough to become familiar with them. When you document misbehaves, often these characters are the culprit.

Sometimes you will find characters that wish they were special, but are not. These include the cedilla (ç), the degree (°), and diphthongs (æ). All these are represented by LATEX 2$_\varepsilon$ commands, you will use the command for the character.

Exercise: Scott Pakin has published the booklet *The Comprehensiv LATEX Symbol List*. You can find this online in PDF format. Search for it and just look at it. It contains over 300 pages of symbols. You'll be amazed!

3.2 Inline math

- $
- plus or +
- - (dash or subtraction)
- times or ast
- frac or div
- sqrt
- ^ (caret or circumflex)
- _ (underscore)

This is an example of inline math. Use the dollar symbol ($) to set the math. Here is how it works. Addition: $4 + 5 = 9$. Subtraction: $4 - 5 = -1$. Multiplication:

$4 \times 5 = 20$. Multiplication: $4 * 5 = 20$. Division: $\frac{4}{5} = 0.8$. Division: $4 \div 5 = 0.8$. Square root: $\sqrt{2} = 1.41421$. Exponents: $2^8 = 256$. Subscripts: x_0, x_1, x_2.

```
\documentclass{article}
    \title{Inline Math}
    \author{Charles Carter}
    \date{\today{}}
\begin{document}
    \maketitle{}
This is an example of inline math. Use the dollar symbol (\$) to set the math.
Here is how it works.
    Addition: $4 + 5 = 9$.
    Subtraction: $4 - 5 = -1$.
    Multiplication: $4 \times 5 = 20$.
    Multiplication: $4 \ast 5 = 20$.
    Division: $\frac{4}{5} = 0.8$.
    Division: $4 \div 5 = 0.8$.
    Square root: $\sqrt{2} = 1.41421$.
    Exponents: $2^8 = 256$.
Subscripts: $x_0, x_1, x_2$
\end{document}
```

Exercise: You can find the *User's Guide for the* `amsmath` *Package* in PDF format online. Search for it and start reading through it.

3.3 Equations

- amsmath
- equation
- equation*

LaTeX 2$_\varepsilon$ provides the *equation* environment for writing block equations with the *amsmath* package. First, import the package with `usepackage{amsmath}`. Equations are numbered and can be referenced by means of their labels. The starred version omits the equation from the numbered equations. Here are some examples. Equation 1 is the formula for a straight line. Equation 2 is the formula for the slope of a straight line. The third, unnumbered equation is the formula for a straight line with multiple parameters.

$$y = \beta_0 + \beta_1 x_1 \tag{1}$$

$$m = \frac{y_1 - y_0}{x_1 - x_0} \tag{2}$$

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3$$

```
\documentclass{article}
\usepackage{amsmath}
```

```
    \title{Equations}
    \author{Charles Carter}
    \date{\today{}}
\begin{document}
    \maketitle{}
This is an example of equations.
\begin{equation}
\label{line}
y = \beta_0 + \beta_1 x_1
\end{equation}
\begin{equation}
\label{slope}
m = \frac{y_1 - y_0}{x_1 - x_0}
\end{equation}
\begin{equation*}
y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3
\end{equation*}
\end{document}
```

Exercise: Continue reading through the *User's Guide for the* `amsmath` *Package*.

3.4 Multiline equations

- align
- gather
- multline

How do I place several equations together in one equation environment, alighed on a particular character, such as an equal sign (=)? Use the *align* environment, with the ampersand (&) as the tab character, and end each line with two backslashs (\\).

$$y = \beta_0 + \beta_1 x_1 \tag{3}$$

$$slope = \frac{y_1 - y_0}{x_1 - x_0} \tag{4}$$

$$predictedvalue = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 \tag{5}$$

How to I center the equations? Use the *gather* environment, with no tab character but ending each line with two backslashes (\\).

$$y = \beta_0 + \beta_1 x_1 \tag{6}$$

$$slope = \frac{y_1 - y_0}{x_1 - x_0} \tag{7}$$

$$predictedvalue = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 \tag{8}$$

What if I have a very long equation that won't fit on one line? Use the *multiine* environment, breaking with two backslashes (\\)

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 + \beta_9 x_9 \quad (9)$$

```
\documentclass{article}
\usepackage{amsmath}
    \title{Multiline Equations}
    \author{Charles Carter}
    \date{\today{}}
\begin{document}
    \maketitle{}
This is an example of align.
\begin{align}
y& = \beta_0 + \beta_1 x_1\\
slope& = \frac{y_1 - y_0}{x_1 - x_0}\\
predictedvalue& = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3
\end{align}
This is an example of gather.
\begin{gather}
y = \beta_0 + \beta_1 x_1\\
slope = \frac{y_1 - y_0}{x_1 - x_0}\\
predictedvalue = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3
\end{gather}
This is an example of multline.
\begin{multline}
y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 +\\
\beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 +\\
\beta_7 x_7 + \beta_8 x_8 + \beta_9 x_9
\end{multline}
\end{document}
```

3.5 Higher math

- sums
- products
- limits
- derivatives
- integrals

Equation 10 states the shorthand for the sum of a series of integers 1 through n. Equation 11 states the shorthand for the product of a series of integeers 1 through

n. Equation 12 demonstrates the notation for limits. Equation 13 demonstrates the notation for derivatives. Equation 14 demonstrates the notation for integrals.

$$\sum_{i=1}^{i=n} i = 1 + 2 + 3 + \cdots + n \tag{10}$$

$$\prod_{i=1}^{i=n} i = 1 \times 2 \times 3 \times \cdots \times n \tag{11}$$

$$\lim_{x \to \infty} f(x) \tag{12}$$

$$\frac{d}{dx}\left[e^{\frac{x}{2}} sin(ax)\right] \tag{13}$$

$$\int_a^b x^2 dx \tag{14}$$

```
\documentclass{article}
    \title{Higher Math}
    \author{Charles Carter}
    \date{\today{}}
\begin{document}
    \maketitle{}
\begin{gather}
\sum_{i=1}^{i=n} i = 1 + 2 + 3 + \dotsm{} + n \\
\prod_{i=1}^{i=n} i = 1 \times 2 \times 3 \times \dotsm{} \times n \\
\lim_{x \to \infty} f(x) \label{higher:lim} \\
\frac{d}{dx} \left[ e^\frac{x}{2} sin(ax)\right] \\
\int_{a}^{b} x^2 dx
\end{gather}
\end{document}
```

Exercise: Continue reading through the *User's Guide for the* `amsmath` *Package.*

3.6 Matrices and vectors

3.7 Greek letters

Here are the Greek letters commonly used in mathematical and scientific applications. The LaTeX 2_ε commands for the Greek letters are in inline math mode, so you *must* surround the command by a pair of dollar signs (\$...\$). You must also use the `amsmath` package.

Alpha	Alpha	A	alpha	α
Beta	B	B	beta	β
Gamma	Gamma	Γ	gamma	γ
Delta	Delta	Δ	delta	δ
Epsilon	E	E	epsilon	ϵ
Zeta	Z	Z	zeta	ζ
Eta	H	H	eta	η
Theta	Theta	Θ	theta	θ
Iota	I	I	iota	$k\iota$
Kappa	K	K	kappa	κ
Lamba	Lambda	Λ	lambda	λ
Mu	M	M	mu	μ
Nu	N	N	nu	ν
Xi	Xi	Ξ	xi	ξ
Omicron	O	O	o	o
Pi	Pi	Π	pi	π
Rho	R	R	rho	ρ
Sigma	S	S	sigma	σ
Tau	T	T	tau	τ
Upsilon	Y	Y	upsilon	υ
Phi	Phi	Φ	phi	ϕ
Chi	X	X	chi	χ
Psi	Psi	Ψ	psi	ψ
Omega	Omega	Ω	omega	ω

```
\documentclass{article}
    \usepackage{amsmath}
    \title{Greek Letters}
    \author{Charles Carter}
    \date{\today{}}
\begin{document}
    \maketitle
        \begin{tabular}{|| l || l | l || l | l ||}
            \hline
            Alpha & Alpha & $A$      & alpha & $\alpha$ \\
            \hline
            Beta & B & $B$     & beta & $\beta$ \\
            \hline
            Gamma & Gamma & $\Gamma$     & gamma & $\gamma$ \\
            \hline
            Delta & Delta & $\Delta$     & delta & $\delta$ \\
            \hline
            Epsilon & E & $E$     & epsilon & $\epsilon$ \\
            \hline
            Zeta & Z & $Z$     & zeta & $\zeta$ \\
            \hline
            Eta & H  & $H$     & eta & $\eta$ \\
            \hline
            Theta & Theta & $\Theta$    & theta & $\theta$ \\
            \hline
            Iota & I & $I$     & iota & $k\iota$ \\
```

```
            \hline
            Kappa & K & $K$     &  kappa & $\kappa$ \\
            \hline
            Lamba & Lambda & $\Lambda$    & lambda & $\lambda$ \\
            \hline
            Mu  & M & $M$     & mu & $\mu$ \\
            \hline
            Nu & N & $N$     & nu & $\nu$ \\
            \hline
            Xi & Xi & $\Xi$     & xi & $\xi$ \\
            \hline
            Omicron & O & $O$    & o & $o$ \\
            \hline
            Pi & Pi & $\Pi$     & pi & $\pi$ \\
            \hline
            Rho & R & $R$    & rho & $\rho$ \\
            \hline
            Sigma & S & $S$    & sigma & $\sigma$ \\
            \hline
            Tau & T & $T$    & tau & $\tau$ \\
            \hline
            Upsilon & Y & $Y$    & upsilon & $\upsilon$ \\
            \hline
            Phi & Phi & $\Phi$     & phi & $\phi$ \\
            \hline
            Chi & X & $X$     & chi & $\chi$ \\
            \hline
            Psi & Psi & $\Psi$     & psi & $\psi$ \\
            \hline
            Omega & Omega & $\Omega$    & omega & $\omega$ \\
            \hline
        \end{tabular}
\end{document}
```

Exercise: Mathematics uses a large number of non-Latin characters. For example, search for the Hebrew character Aleph (ℵ) and the symbol for infinity (∞).

LaTeX 2$_\varepsilon$ is *Well Documented*

4 References

In scientific and research writing, one of the most critical aspects is references. Think about it: can you imagine a research paper without a single reference? These include footnotes, endnotes, marginal notes, and especially citations to sources. References have two components, a target and a source, or a label and a reference to that label. We have used labels before, but now we will expicitly consider them.

4.1 Footnotes

- footnote
- label
- ref
- pageref

To insert a footnote, just use the command footnote.[5] If you label the footnote, you can refer to the footnote by number and page in the text of the doucumemt. Please be sure to read footnote 5 on page 22.

```
\documentclass{article}
    \title{Footnotes and References}
    \author{Charles Carter}
    \date{\today{}}
\begin{document}
    \maketitle{}
    To insert a footnote, just use the command \text{footnote}.\footnote{\label{references:fn
    Don't forget to put the \textbackslash{} before the \texttt{footnote} command.} If you
    label the footnote, you can refer to the footnote by number and page in the text of the
    doucumemt. Please be sure to read footnote \ref{references:fn} on page
    \pageref{references:fn}.
\end{document}
```

Exercise: Read the LaTeX 2_ε documentation on footnotes.

4.2 Endnotes

- package endnotes
- endnote
- theendnotes
- addcontentsline

[5] Don't forget to put the \ before the `footnote` command.

Endnotes are a little more complicated than footnotes, but not much.[1] Here is an endnote.[2] In order to actually print the endnotes, use the `theendnotes` command. In order to create an entry for the endnotes in the table of contents, you must use the `addcontentsline`.[3] Please see endnote 3 on page 28 for the details.

```
\documentclass{article}
    \usepackage{endnotes}
    \title{Endnotes}
    \author{Charles Carter}
    \date{\today{}}
\begin{document}
    \maketitle{}
    \tableofcontents{}
    \section{Text}
    Endnotes are a little more complicated than footnotes, but not much.\endnote{The
    difference between footnotes and endnotes is that footnotes go at the foot of
    the page where they appear, whilc endnotes appear at the end of the document.}
    Here is an endnote.\endnote{This is an endnote.} In order to actually print
    the endnotes, use the \texttt{theendnotes} command. In order to create an
    entry for the endnotes in the table of contents, you must use the \texttt{addcontentsline
    \endnote{\label{references:en}The addcontentsline takes three parameters,
    where the line should be written, usually \textit{toc}, the formatting to be
    used, usually \textit{section}, and the name to be given to the entry, perhaps
    \textit{Endnotes}.} Please see endnote \ref{references:en} on page
    \pageref{references:en} for the details.
    \theendnotes{}
    \addcontentsline{toc}{section}{Endnotes}
\end{document}
```

Exercise: Find and read through the documentation of the Endnotes package.

4.3 Margin notes

- marginpar
- reversemarginpar
- normalmarginpar
- raggedright

Important point!

Marginal notes are really useful to call attention to very important points. They can also be useful in drafting documents to note future edits, insertions, or deletions. Use `marginpar` to create a marginal note. To delete marginal notes during the drafting process, just comment them out. The text remains as a reminder of the modifications in the document.

This is reversed text

To permanantly reverse the page sides. use `reversemarginpar`. To reverse the reverse page margins, use `normalmarginpar`. To change the paragraph alignment from the default justified text, use the command `raggedright` in a block.

This is in the correct margim

```
\documentclass{article}
    \title{Margin Notes}
    \author{Charles Carter}
    \date{\today{}}
\begin{document}
    \maketitle{}
        \marginpar{Important point!}
        Marginal notes are really useful to call attention to very important
        points.  They can also be useful in drafting documents to note
        future edits, insertions, or deletions. Use \texttt{marginpar}
        to create a marginal note. To delete marginal notes during the
        drafting process, just comment them out. The text remains as a
        reminder of the modifications in the document.
        {\raggedright\reversemarginpar{\marginpar{This is reversed text}}}
        To permanantly reverse the page sides. use \texttt{reversemarginpar}.
        To reverse the reverse page margins, use \texttt{normalmarginpar}.
        {\raggedright\normalmarginpar\marginpar{This is in the correct margim}}
\end{document}
```

Exercise: If you really need to create sophisticated marginal notes, you will need both the `geometry` and `marginnote` packages. The former is very useful, and you may need to use it in every paper. The latter is useful for marginal notes when you need something more than the default LaTeX 2_ε commands.

4.4 Bibliography

4.5 Citations

4.6 Indices

LaTeX 2$_\varepsilon$ is *Well Documented*

5 Lists

5.1 Unordered Lists

5.2 Dictionary Lists

5.3 Listings Package

5.4 Listings Version 1

5.5 Listings Version 2

6 Tables

7 Images

8 Conclusion

A Installing LaTeX 2ε

B Development Environments

C Command Line Execution

Notes

[1]The difference between footnotes and endnotes is that footnotes go at the foot of the page where they appear, whilc endnotes appear at the end of the document.

[2]This is an endnote.

[3]The addcontentsline takes three parameters, where the line should be written, usually *toc*, the formatting to be used, usually *section*, and the name to be given to the entry, perhaps *Endnotes*.