A Tufte-Style Book*

The Tufte-LaTeX Developers

First printing,

Dedicated to those who appreciate LaTeX and the work of and .

Introduction

This sample book discusses the design of Edward Tufte's books[**?**, **?**, **?**, **?**] and the use of the and document classes.

The Design of Tufte's Books

of a book are usually divided into three major sections: the front matter (also called preliminary matter or prelim), the main matter (the core text of the book), and the back matter (or end matter).

of a book refers to all of the material that comes before the main text. The following table shows a list of material that appears in the front matter of , , , and along with its page number. Page numbers that appear in parentheses refer to folios that do not have a printed page number (but they are still counted in the page number sequence).

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*Thanks to Edward R. Tufte for his inspiration.

(l)2-5 Page content			
Blank half title page			
Frontispiece			
Full title page			
Copyright page			
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The design of the front matter in Tufte's books varies slightly from the traditional design of front matter. First, the pages in front matter are traditionally numbered with lowercase roman numerals (, i, ii, iii, iv, . . .). Second, the front matter page numbering sequence is usually separate from the main matter page numbering. That is, the page numbers restart at 1 when the main matter begins. In contrast, Tufte has enumerated his pages with arabic numerals that share the same page counting sequence as the main matter.

There are also some variations in design across Tufte's four books. The page opposite the full title page (labeled "frontispiece" in the above table) has different content in each of the books. In , this page is blank; in and , this page holds a frontispiece; and in , this page contains three epigraphs.

The dedication appears on page 6 in (opposite the introduction), and is placed on its own spread in the other books. In , an epigraph shares the spread with the opening page of the introduction.

None of the page numbers (folios) of the front matter are expressed except in , where the folios start to appear on the dedication page.

of each of the books varies slightly in design. In all the books, the author's name appears at the top of the page, the title it set just above the center line, and the publisher is printed along the bottom margin. Some of the differences are outlined in the following table.

Feature				
Author				
Typeface	serif	serif	serif	sans serif
Style	italics	italics	italics	upright, caps
Size	24 pt	20 pt	20 pt	20 pt
Title				
Typeface	serif	serif	serif	sans serif
Style	upright	italics	upright	upright, caps
Size	36 pt	48 pt	48 pt	36 pt
Subtitle				
Typeface			serif	

Feature				
Style			upright	
Size			20 pt	
Edition				
Typeface	sans serif			
Style	upright, caps			
Size	14 pt			
Publisher				
Typeface	serif	serif	serif	sans serif
Style	italics	italics	italics	upright, caps
Size	14 pt	14 pt	14 pt	14 pt

in Tufte's books give us our first glimpse of the structure of the main matter. is split into two parts, each containing some number of chapters. His other three books only contain chapters—they're not broken into parts.

Typefaces

Tufte's books primarily use two typefaces: Bembo and Gill Sans. Bembo is used for the headings and body text, while Gill Sans is used for the title page and opening epigraphs in .

Since neither Bembo nor Gill Sans are available in default LaTeX installations, the document classes default to using Palatino and Helvetica, respectively. In addition, the Bera Mono typeface is used for `monospaced` type.

The following font sizes are defined by the classes:

Table 3: A list of LaTeX font sizes as defined by the document classes.

LaTeX size	Font size	Leading	Used for
`\tiny`	5	6	sidenote numbers
`\scriptsize`	7	8	
`\footnotesize`	8	10	sidenotes, captions
`\small`	9	12	quote, quotation, and verse environments
`\normalsize`	10	14	body text
`\large`	11	15	B-heads
`\Large`	12	16	A-heads, TOC entries, author, date
`\LARGE`	14	18	handout title
`\huge`	20	30	chapter heads
`\Huge`	24	36	part titles

Headings

Tufte's books include the following heading levels: parts, chapters, sections, subsections, and paragraphs. Not defined by default are: sub-subsections and subparagraphs.

Table 4: Heading styles used in .

Heading	Style	Size
Part	roman	
Chapter	italic	
Section	italic	
Subsection	italic	
Paragraph	italic	10/14

Paragraph

Paragraph headings (as shown here) are introduced by italicized text and separated from the main paragraph by a bit of space.

Environments

The following characteristics define the various environments:

Table 5: Environment styles used in .

Environment	Font size	Notes
Body text		
Block quote		Block indent (left and right) by
Sidenotes		Sidenote number is set inline, followed by word space
Captions		

On the Use of the `tufte-book` Document Class

The document classes define a style similar to the style Edward Tufte uses in his books and handouts. Tufte's style is known for its extensive use of sidenotes, tight integration of graphics with text, and well-set typography. This document aims to be at once a demonstration of the features of the document classes and a style guide to their use.

Page Layout

Headings

This style provides A- and B-heads (that is, `\section` and `\subsection`), demonstrated above.

If you need more than two levels of section headings, you'll have to define them yourself at the moment; there are no pre-defined styles for anything below a `\subsection`. As Bringhurst points out in *The Elements of Typographic Style*,[**?**] you should "use as many levels of headings as you need: no more, and no fewer."

The classes will emit an error if you try to use `\subsubsection` and smaller headings.

,[**?**] Tufte starts each section with a bit of vertical space, a non-indented paragraph, and sets the first few words of the sentence in SMALL CAPS. To accomplish this using this style, use the command:

{In his later books}, Tufte starts...

Sidenotes

One of the most prominent and distinctive features of this style is the extensive use of sidenotes. There is a wide margin to provide ample room for sidenotes and small figures. Any s will automatically be converted to sidenotes.[1] If you'd like to place ancillary information in the margin without the sidenote mark (the superscript number), you can use the command.

The specification of the command is:

[][]{}

Both the and arguments are optional. If you provide a argument, then that number will be used as the sidenote number. It will change of the number of the current sidenote only and will not affect the numbering sequence of subsequent sidenotes.

Sometimes a sidenote may run over the top of other text or graphics in the margin space. If this happens, you can adjust the vertical position of the sidenote by providing a dimension in the argument. Some examples of valid dimensions are:

1.0in 2.54cm 6`\baselineskip`

If the dimension is positive it will push the sidenote down the page; if the dimension is negative, it will move the sidenote up the page.

[1] This is a sidenote that was entered using the `\footnote` command.

While both the and arguments are optional, they must be provided in order. To adjust the vertical position of the sidenote while leaving the sidenote number alone, use the following syntax:

[][]{}

The empty brackets tell the `\sidenote` command to use the default sidenote number.

If you *only* want to change the sidenote number, however, you may completely omit the argument:

[]{}

The command has a similar argument:

[]{}

References

References are placed alongside their citations as sidenotes, as well. This can be accomplished using the normal command.

The complete list of references may also be printed automatically by using the command. (See the end of this document for an example.) If you do not want to print a bibliography at the end of your document, use the command in its place.

To enter multiple citations at one location,[**?**, **?**] you can provide a list of keys separated by commas and the same optional vertical offset argument: `\cite{Tufte2006,Tufte1990}`.

[]{}

Figures and Tables

Images and graphics play an integral role in Tufte's work. In addition to the standard and environments, this style provides special figure and table environments for full-width floats.

Full page–width figures and tables may be placed in or environments. To place figures or tables in the margin, use the or environments as follows (see figure [fig:marginfig]):

image

\begin{marginfigure}
\includegraphics{helix}
\caption{This is a margin figure.}
\label{fig:marginfig}

\end{marginfigure}

The and environments accept an optional parameter that adjusts the vertical position of the figure or table. See the “” section above for examples. The specifications are:

\begin{marginfigure}[]
...
\end{marginfigure}

\begin{margintable}[]
...
\end{margintable}

Figure [fig:fullfig] is an example of the environment and figure [fig:textfig] is an example of the normal environment.

image

Hilbert curves of various degrees n. Notice that this figure only takes up the main textblock width.

As with sidenotes and marginnotes, a caption may sometimes require vertical adjustment. The command now takes a second optional argument that enables you to do this by providing a dimension . You may specify the caption in any one of the following forms:

{}
[]{}
[][]{}
[][]{}

A positive will push the caption down the page. The short caption, if provided, is what appears in the list of figures/tables, otherwise the “long” caption appears there. Note that although the arguments and are both optional, they must be provided in order. Thus, to specify an without specifying a , you must include the first set of empty brackets `[]`, which tell to use the default “long” caption. As an example, the caption to figure [fig:textfig] above was given in the form

[Hilbert curves...][6pt]{Hilbert curves...}

Table [tab:normaltab] shows table created with the package. Notice the lack of vertical rules—they serve only to clutter the table’s data.

Table 6: Here are the dimensions of the various margins used in the Tufte-handout class.

Margin	Length
Paper width	
Paper height	
Textblock width	
Textblock/sidenote gutter	
Sidenote width	

LaTeX will generate an error message:[err:too-many-floats]

Error: Too many unprocessed floats

LaTeX tries to place floats in the best position on the page. Until it's finished composing the page, however, it won't know where those positions are. If you have a lot of floats on a page (including sidenotes, margin notes, figures, tables, etc.), LaTeX may run out of "slots" to keep track of them and will generate the above error.

LaTeX initially allocates 18 slots for storing floats. To work around this limitation, the document classes provide a command that will reserve more slots.

The first time is called, it allocates an additional 34 slots. The second time is called, it allocates another 26 slots.

The command may only be used two times. Calling it a third time will generate an error message. (This is because we can't safely allocate many more floats or LaTeX will run out of memory.)

If, after using the command twice, you continue to get the `Too many unprocessed floats` error, there are a couple things you can do.

The command will immediately process all the floats before typesetting more material. Since will start a new paragraph, you should place this command at the beginning or end of a paragraph.

The command will also process the floats before continuing, but instead of starting a new paragraph, it will start a new page.

You can also try moving your floats around a bit: move a figure or table to the next page or reduce the number of sidenotes. (Each sidenote actually uses *two* slots.)

After the floats have placed, LaTeX will mark those slots as unused so they are available for the next page to be composed.

Captions

You may notice that the captions are sometimes misaligned. Due to the way LaTeX's float mechanism works, we can't know for sure where it decided to put a float. Therefore, the document classes provide commands to override the caption position.

Vertical alignment

To override the vertical alignment, use the command inside the float environment. For example:

```
\begin{figure}[btp]
\includegraphics{sinewave}
\caption{This is an example of a sine wave.}
\label{fig:sinewave}


\end{figure}
```

The syntax of the command is:

```
{}
```

where can be either `b` for bottom-aligned captions, or `t` for top-aligned captions.

Horizontal alignment

To override the horizontal alignment, use either the or the command inside of the float environment. For example:

```
\begin{figure}[btp]
\includegraphics{sinewave}
\caption{This is an example of a sine wave.}
\label{fig:sinewave}


\end{figure}
```

The command causes the algorithm to assume the float has been placed on a verso page—that is, a page on the left side of a two-page spread. Conversely, the command causes the algorithm to assume the float has been placed on a recto page—that is, a page on the right side of a two-page spread.

Full-width text blocks

In addition to the new float types, there is a environment that stretches across the main text block and the sidenotes area.

```
\begin{fullwidth}
Lorem ipsum dolor sit amet...
\end{fullwidth}
```

Typography

Typefaces

If the Palatino, , and `Bera Mono` typefaces are installed, this style will use them automatically. Otherwise, we'll fall back on the Computer Modern typefaces.

Letterspacing

This document class includes two new commands and some improvements on existing commands for letterspacing.

When setting strings of or , the letterspacing—that is, the spacing between the letters—should be increased slightly.[**?**] The command has proper letterspacing for strings of , and the command has letterspacing for . These commands will also automatically convert the case of the text to upper- or lowercase, respectively.

The command has also been redefined to include letterspacing. The case of the argument is left as is, however. This allows one to use both uppercase and lowercase letters: The Initial Letters Of The Words In This Sentence Are Capitalized.

Document Class Options

The class is based on the LaTeX document class. Therefore, you can pass any of the typical book options. There are a few options that are specific to the document class, however.

The option will set the paper size to instead of the default letter size.

The option will set the sidenotes and title block in a typeface instead of the default roman.

The option will modify the running heads so that the page number is printed on the outside edge (as opposed to always printing the page number on the right-side edge in mode).

The option typesets the sidenotes on the outside edge of the page. This is how books are traditionally printed, but is contrary to Tufte's book design which sets the sidenotes on the right side of the page. This option implicitly sets the option.

The option sets all the text fully justified (flush left and right). The default is to set the text ragged right. The body text of Tufte's books are set ragged right. This prevents needless hyphenation and makes it easier to read the text in the slightly narrower column.

The option loads the package which is used with to typeset bi-directional text. Since the package needs to be loaded before the sidenotes and cite commands are defined, it can't be loaded in the document preamble.

The option causes the classes to output debug information to the log file which is useful in troubleshooting bugs. It will also cause the graphics to be replaced by outlines.

The option prevents the classes from automatically loading the Palatino and Helvetica typefaces. You should use this option if you wish to load your own fonts. If you're using , this option is implied (, the Palatino and Helvetica fonts aren't loaded if you use).

The option inhibits the letterspacing code. The classes try to load the appropriate letterspacing package (either pdfTeX's package or the package). If you're using with , however, you should configure your own letterspacing.

The option causes to generate a title block instead of a title page. The class defaults to a title page and the class defaults to the title block. There is an analogous option that forces to generate a full title page instead of the title block.

The option suppresses 's custom table of contents (TOC) design. The current TOC design only shows unnumbered chapter titles; it doesn't show sections or subsections. The option will revert to LaTeX's TOC design.

The option prevents the package from being loaded. The default is to load the package and use the and contents as metadata for the generated PDF.

Customizing

The document classes are designed to closely emulate Tufte's book design by default. However, each document is different and you may encounter situations where the default settings are insufficient. This chapter explores many of the ways you can adjust the document classes to better fit your needs.

File Hooks

If you create many documents using the classes, it's easier to store your customizations in a separate file instead of copying them into the preamble of each document. The classes provide three file hooks: , , and .

If this file exists, it will be loaded by all of the document classes just prior to any document-class-specific code. If your customizations or code should be included in both the book and handout classes, use this file hook.

If this file exists, it will be loaded after all of the common and book-specific code has been read. If your customizations apply only to the book class, use this file hook.

If this file exists, it will be loaded after all of the common and handout-specific code has been read. If your customizations apply only to the handout class, use this file hook.

Numbered Section Headings

While Tufte dispenses with numbered headings in his books, if you require them, they can be enabled by changing the value of the counter. From the table below, select the heading level at which numbering should stop and set the counter to that value. For example, if you want parts and chapters numbered, but don't want numbering for sections or subsections, use the command:

{secnumdepth}{0}

The default for the document classes is −1.

Table 7: Heading levels used with the `secnumdepth` counter.

Heading level	Value
Part (in)	−1
Part (in)	0
Chapter (only in)	0
Section	1
Subsection	2
Subsubsection	3
Paragraph	4
Subparagraph	5

Changing the Paper Size

The classes currently only provide three paper sizes: A4, B5, and US letter. To specify a different paper size (and/or margins), use the command in the preamble of your document (or one of the file hooks). The full documentation of the command may be found in the package documentation.[**?**]

Customizing Marginal Material

Marginal material includes sidenotes, citations, margin notes, and captions. Normally, the justification of the marginal material follows the justification of the body text. If you specify the document class option, all of the margin material will be fully justified as well. If you don't specify the option, then the marginal material will be set ragged right.

You can set the justification of the marginal material separately from the body text using the following document class options: , , , , and . Each option refers to its obviously corresponding marginal material type. The option simultaneously sets the justification on all four marginal material types.

Each of the document class options takes one of five justification types:

Fully justifies the text (sets it flush left and right).

Sets the text ragged left, regardless of which page it falls on.

Sets the text ragged right, regardless of which page it falls on.

Sets the text ragged left if it falls on the left-hand (verso) page of the spread and otherwise sets it ragged right. This is useful in conjunction with the document class option.

If the document class option was specified, then set the text fully justified; otherwise the text is set ragged right. This is the default justification option if one is not explicitly specified.

For example,

[symmetric,justified,marginals=raggedouter]{tufte-book}

will set the body text of the document to be fully justified and all of the margin material (sidenotes, margin notes, captions, and citations) to be flush against the body text with ragged outer edges.

of the marginal material may also be modified using the following commands:

{}
{}
{}
{}

The sets the font and style for sidenotes, the for captions, the for margin notes, and the for citations. The can contain font size changes (e.g., , , etc.), font style changes (e.g., , , , etc.), color changes (e.g., `{blue}`), and many other adjustments.

If, for example, you wanted the captions to be set in italic sans serif, you could use:

{}

Compatibility Issues

When switching an existing document from one document class to a document class, a few changes to the document may have to be made.

Converting from to

The following class options are unsupported: , , , , , , , , , and .

The following headings are not supported: and .

Converting from to

The following class options are unsupported: , , , , , , , , , and .

The following headings are not supported: and .

Troubleshooting and Support

Website

The website for the packages is located at http://code.google.com/p/tufte-latex/. On our website, you'll find links to our repository, mailing lists, bug tracker, and documentation.

Mailing Lists

There are two mailing lists for the project:

Discussion list

The `tufte-latex` discussion list is for asking questions, getting assistance with problems, and help with troubleshooting. Release announcements are also posted to this list. You can subscribe to the `tufte-latex` discussion list at http://groups.google.com/group/tufte-latex.

Commits list

The `tufte-latex-commits` list is a read-only mailing list. A message is sent to the list any time the code has been updated. If you'd like to keep up with the latest code developments, you may subscribe to this list. You can subscribe to the `tufte-latex-commits` mailing list at http://groups.google.com/group/tufte-latex-commits.

Getting Help

If you've encountered a problem with one of the document classes, have a question, or would like to report a bug, please send an email to our mailing list or visit our website.

To help us troubleshoot the problem more quickly, please try to compile your document using the class option and send the generated `.log` file to the mailing list with a brief description of the problem.

Errors, Warnings, and Informational Messages

The following is a list of all of the errors, warnings, and other messages generated by the classes and a brief description of their meanings.

Package Dependencies

The following is a list of packages that the document classes rely upon. Packages marked with an asterisk are optional.

2

- xifthen
- ifpdf*
- ifxetex*
- hyperref
- geometry

- ragged2e
- chngpage *or* changepage
- paralist
- textcase
- soul*
- letterspace*
- setspace
- natbib *and* bibentry
- optparams
- placeins
- mathpazo*
- helvet*
- fontenc
- beramono*
- fancyhdr
- xcolor
- textcomp
- titlesec
- titletoc