

” **tutorial.do.txt** ”

Missing: FIGURE, MOVIE, environments

TITLE: Doconce: Document Once, Include Anywhere

AUTHOR: Hans Petter Langtangen at Simula Research Laboratory and University of Oslo

DATE: today

- * When writing a note, report, manual, etc., do you find it difficult to choose the typesetting format? That is, to choose between plain (email-like) text, wiki, Word/OpenOffice, LaTeX, HTML, reStructuredText, Sphinx, XML, etc. Would it be convenient to start with some very simple text-like format that easily converts to the formats listed above, and then at some later stage eventually go with a particular format?
- * Do you need to write documents in varying formats but find it difficult to remember all the typesetting details of various formats like "LaTeX": "<http://refcards.com/docs/silvermanj/amslatex/LaTeXRefCard.v2.0.pdf>", "HTML": "<http://www.htmlcodetutorial.com/>", "reStructuredText": "<http://docutils.sourceforge.net/docs/ref/rst/restructuredtext.html>", "Sphinx": "<http://sphinx.pocoo.org/contents.html>", and "wiki": "<http://code.google.com/p/support/wiki/WikiSyntax>"? Would it be convenient to generate the typesetting details of a particular format from a very simple text-like format with minimal tagging?
- * Do you have the same information scattered around in different documents in different typesetting formats? Would it be a good idea to write things once, in one format, stored in one place, and include it anywhere?

If any of these questions are of interest, you should keep on reading.

==== What Does Doconce Look Like? =====

Doconce text looks like ordinary text, but there are some almost invisible text constructions that allow you to control the formatting. Here are some examples.

- * Bullet lists arise from lines starting with `*`.
- * **Emphasized words** are surrounded by `*`.
- * Words in boldface are surrounded by underscores.
- * Words from computer code are enclosed in back quotes and then typeset `verbatim` (in a monospace font).
- * Section headings are recognized by equality (`=`) signs before and after the title, and the number of `=` signs indicates the level of the section: 7 for main section, 5 for subsection, and 3 for subsubsection.
- * Paragraph headings are recognized by a double underscore before and after the heading.
- * The abstract of a document starts with **Abstract** as paragraph heading, and all text up to the next heading makes up the abstract,

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- * Blocks of computer code can easily be included by placing `'!bc'` (begin code) and `'!ec'` (end code) commands at separate lines before and after the code block.
- * Blocks of computer code can also be imported from source files.
- * Blocks of LaTeX mathematics can easily be included by placing `'!bt'` (begin TeX) and `'!et'` (end TeX) commands at separate lines before and after the math block.
- * There is support for both LaTeX and text-like inline mathematics.
- * Figures and movies with captions, simple tables, URLs with links, index list, labels and references are supported.
- * Invisible comments in the output format can be inserted throughout the text.
- * Visible comments can be inserted so that authors and readers can comment upon the text (and at any time turn on/off output of such comments).
- * There is an exercise environment with many advanced features.
- * With a preprocessor, Preprocess or Mako, one can include other documents (files) and large portions of text can be defined in or out of the text.
- * With Mako one can also have Python code embedded in the Doconce document and thereby parameterize the text (e.g., one text can describe programming in two languages).

Here is an example of some simple text written in the Doconce format:

```
!bc
===== A Subsection with Sample Text =====
label{my:first:sec}
```

Ordinary text looks like ordinary text, and the tags used for `_boldface_` words, `*emphasized*` words, and `'computer'` words look natural in plain text. Lists are typeset as you would do in email,

- * item 1
- * item 2
- * item 3

Lists can also have automatically numbered items instead of bullets,

- o item 1
- o item 2
- o item 3

URLs with a link word are possible, as in `"hpl": "http://folk.uio.no/hpl"`. If the word is URL, the URL itself becomes the link name, as in `"URL": "tutorial.do.txt"`.

References to sections may use logical names as labels (e.g., a `"label"` command right after the section title), as in the reference to `Section ref{my:first:sec}`.

" **tutorial.do.txt** "

Doconce also allows inline comments of the form [name: comment] (with a space after 'name:'), e.g., such as [hpl: here I will make some remarks to the text]. Inline comments can be removed from the output by a command-line argument (see Section `ref{doconce2formats}` for an example).

Tables are also supported, e.g.,

time	velocity	acceleration
0.0	1.4186	-5.01
2.0	1.376512	11.919
4.0	1.1E+1	14.717624

lines beginning with # are comment lines

!ec

The Doconce text above results in the following little document:

==== A Subsection with Sample Text ====

label{my:first:sec}

Ordinary text looks like ordinary text, and the tags used for `_boldface_` words, `*emphasized*` words, and `'computer'` words look natural in plain text. Lists are typeset as you would do in an email,

- * item 1
- * item 2
- * item 3

Lists can also have numbered items instead of bullets, just use an 'o' (for ordered) instead of the asterisk:

- o item 1
- o item 2
- o item 3

URLs with a link word are possible, as in "hpl":"http://folk.uio.no/hpl". If the word is URL, the URL itself becomes the link name, as in "URL": "tutorial.do.txt".

References to sections may use logical names as labels (e.g., a "label" command right after the section title), as in the reference to Section `ref{my:first:sec}`.

Doconce also allows inline comments such as [hpl: here I will make some remarks to the text] for allowing authors to make notes. Inline comments can be removed from the output by a command-line argument (see Section `ref{doconce2formats}` for an example).

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===== Mathematics and Computer Code =====

Inline mathematics, such as $\nu = \sin(x)$ or $v = \sin(x)$, allows the formula to be specified both as LaTeX and as plain text. This results in a professional LaTeX typesetting, but in other formats the text version normally looks better than raw LaTeX mathematics with backslashes. An inline formula like $\nu = \sin(x)$ or $v = \sin(x)$ is typeset as

```
!bc
 $\nu = \sin(x)$   $v = \sin(x)$ 
!ec
```

The pipe symbol acts as a delimiter between LaTeX code and the plain text version of the formula. If you write a lot of mathematics, only the output formats 'latex', 'pdflatex', 'html', 'sphinx', and 'pandoc' are of interest and all these support inline LaTeX mathematics so then you will naturally drop the pipe symbol and write just

```
!bc
 $\nu = \sin(x)$ 
!ec
```

However, if you want more textual formats, like plain text or reStructuredText, the text after the pipe symbol may help to make the math formula more readable if there are backslashes or other special LaTeX symbols in the LaTeX code.

Blocks of mathematics are typeset with raw LaTeX, inside '`!bt`' and '`!et`' (begin TeX, end TeX) instructions:

```
!bc
|bt
\begin{align}
\{\partial u \over \partial t\} &= \nabla^2 u + f, \text{label{myeq1}} \\
\{\partial v \over \partial t\} &= \nabla \cdot (q(u) \nabla v) + g
\end{align}
|et
!ec
```

Note: |bt and |et (and |bc and |ec below) are used to illustrate
tex and code blocks in inside verbatim blocks and are replaced
by !bt, !et, !bc, and !ec after all other formatting is finished.
The result looks like this:

```
!bt
\begin{align}
\{\partial u \over \partial t\} &= \nabla^2 u + f, \text{label{myeq1}} \\
\{\partial v \over \partial t\} &= \nabla \cdot (q(u) \nabla v) + g
\end{align}
!et
```

Of course, such blocks only looks nice in formats with support for LaTeX mathematics, and here the align environment in particular (this includes 'latex', 'pdflatex', 'html', and 'sphinx'). The raw LaTeX syntax appears in simpler formats, but can still be useful for those who can read LaTeX syntax.

You can have blocks of computer code, starting and ending with '`!bc`' and '`!ec`' instructions, respectively.

” **tutorial.do.txt** ”

```
!bc
|bc pycod
from math import sin, pi
def myfunc(x):
    return sin(pi*x)
```

```
import integrate
I = integrate.trapezoidal(myfunc, 0, pi, 100)
```

```
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Such blocks are formatted as

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A code block must come after some plain sentence (at least for successful output to 'sphinx', 'rst', and ASCII-close formats), not directly after a section/paragraph heading or a table.

One can also copy computer code directly from files, either the complete file or specified parts. Computer code is then never duplicated in the documentation (important for the principle of avoiding copying information!).

Another document can be included by writing '# #include "mynote.do.txt"' at the beginning of a line. Doconce documents have extension 'do.txt'. The 'do' part stands for doconce, while the trailing '.txt' denotes a text document so that editors gives you plain text editing capabilities.

==== Macros (Newcommands), Cross-References, Index, and Bibliography ====

```
label{newcommands}
```

Doconce supports a type of macros via a LaTeX-style `*newcommand*` construction. The newcommands defined in a file with name `'newcommand_replace.tex'` are expanded when Doconce is filtered to other formats, except for LaTeX (since LaTeX performs the expansion itself). Newcommands in files with names `'newcommands.tex'` and `'newcommands_keep.tex'` are kept unaltered when Doconce text is filtered to other formats, except for the Sphinx format. Since Sphinx understands LaTeX math, but not newcommands if the Sphinx output is HTML, it makes most sense to expand all newcommands. Normally, a user will put all newcommands that appear in math blocks surrounded by `'!bt'` and `'!et'` in `'newcommands_keep.tex'` to keep them unchanged, at least if they contribute to make the raw LaTeX math text easier to read in the formats that cannot render LaTeX. Newcommands used elsewhere throughout the text will usually be placed in `'newcommands_replace.tex'` and expanded by Doconce. The definitions of newcommands in the `'newcommands*.tex'` files *must* appear on a single line (multi-line newcommands are too hard to parse with regular expressions).

”

tutorial.do.txt

”

Recent versions of Doconce also offer cross referencing, typically one can define labels below (sub)sections, in figure captions, or in equations, and then refer to these later. Entries in an index can be defined and result in an index at the end for the LaTeX and Sphinx formats. Citations to literature, with an accompanying bibliography in a file, are also supported. The syntax of labels, references, citations, and the bibliography closely resembles that of LaTeX, making it easy for Doconce documents to be integrated in LaTeX projects (manuals, books). For further details on functionality and syntax we refer to the 'doc/manual/manual.do.txt' file (see the "demo page": "<https://doconce.googlecode.com/hg/doc/demos/manual/index.html>" for various formats of this document).

Example on including another Doconce file (using preprocess):

#include "_doconce2anything.do.txt"

===== Demos =====

The current text is generated from a Doconce format stored in the file
!bc
docs/tutorial/tutorial.do.txt
!ec

The file 'make.sh' in the 'tutorial' directory of the Doconce source code contains a demo of how to produce a variety of formats. The source of this tutorial, 'tutorial.do.txt' is the starting point. Running 'make.sh' and studying the various generated files and comparing them with the original 'tutorial.do.txt' file, gives a quick introduction to how Doconce is used in a real case.
"Here": "<https://doconce.googlecode.com/hg/doc/demos/tutorial/index.html>" is a sample of how this tutorial looks in different formats.

There is another demo in the 'docs/manual' directory which translates the more comprehensive documentation, 'manual.do.txt', to various formats. The 'make.sh' script runs a set of translations.

#include "../manual/install.do.txt"

Doconce: Document Once, Include Anywhere

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²University of Oslo

Jan 30, 2013

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URLs with a link word are possible, as in hpl. If the word is URL, the URL itself becomes the link name, as in tutorial.do.txt.

References to sections may use logical names as labels (e.g., a "label" command right after the section title), as in the reference to Section 1.1.

Doconce also allows inline comments such as (**hpl**: *here I will make some remarks to the text*) for allowing authors to make notes. Inline comments can be removed from the output by a command-line argument (see Section 2 for an example).

Tables are also supported, e.g.,

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0.0	1.4186	-5.01
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4.0	1.1E+1	14.717624

1.2 Mathematics and Computer Code

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```
 $\nu = \sin(x)$  $\nu = \sin(x)$ 
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The pipe symbol acts as a delimiter between \LaTeX code and the plain text version of the formula. If you write a lot of mathematics, only the output formats `latex`, `pdflatex`, `html`, `sphinx`, and `pandoc` are of interest and all these support inline \LaTeX mathematics so then you will naturally drop the pipe symbol and write just

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Blocks of mathematics are typeset with raw \LaTeX , inside `bt!` and `et!` (`begin TeX`, `end TeX`) instructions:

```
!bt
\begin{align}
{\partial u \over \partial t} &= \nabla^2 u + f, \text{label{myeq1}} \\
{\partial v \over \partial t} &= \nabla \cdot (q(u) \nabla v) + g \\
\end{align}
!et
```

The result looks like this:

$$\frac{\partial u}{\partial t} = \nabla^2 u + f, \tag{1}$$

$$\frac{\partial v}{\partial t} = \nabla \cdot (q(u) \nabla v) + g \tag{2}$$

Of course, such blocks only look nice in formats with support for \LaTeX mathematics, and here the `align` environment in particular (this includes `latex`, `pdflatex`, `html`, and `sphinx`). The raw \LaTeX syntax appears in simpler formats, but can still be useful for those who can read \LaTeX syntax.

You can have blocks of computer code, starting and ending with `bc!` and `ec!` instructions, respectively.

```
!bc pycod
from math import sin, pi
def myfunc(x):
    return sin(pi*x)

import integrate
I = integrate.trapezoidal(myfunc, 0, pi, 100)
!ec
```

Such blocks are formatted as

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def myfunc(x):
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A code block must come after some plain sentence (at least for successful output to `sphinx`, `rst`, and ASCII-close formats), not directly after a section/paragraph heading or a table.

One can also copy computer code directly from files, either the complete file or specified parts. Computer code is then never duplicated in the documentation (important for the principle of avoiding copying information!).

Another document can be included by writing `#include "mynote.do.txt"` at the beginning of a line. Doconce documents have extension `do.txt`. The `do` part stands for doconce, while the trailing `.txt` denotes a text document so that editors give you plain text editing capabilities.

1.3 Macros (Newcommands), Cross-References, Index, and Bibliography

Doconce supports a type of macros via a \LaTeX -style *newcommand* construction. The newcommands defined in a file with name `newcommand_replace.tex` are expanded when Doconce is filtered to other formats, except for \LaTeX (since \LaTeX performs the expansion itself). Newcommands in files with names `newcommands.tex` and `newcommands_keep.tex` are kept unaltered when Doconce text is filtered to other formats, except for the Sphinx format. Since Sphinx understands \LaTeX math, but not newcommands if the Sphinx output is HTML, it makes most sense to expand all newcommands. Normally, a user will put all newcommands that appear in math blocks surrounded by `bt!` and `et!` in `newcommands_keep.tex` to keep them unchanged, at least if they contribute to make the raw \LaTeX math text easier to read in the formats that cannot render \LaTeX . Newcommands used

elsewhere throughout the text will usually be placed in `newcommands_replace.tex` and expanded by Doconce. The definitions of newcommands in the `newcommands*.tex` files *must* appear on a single line (multi-line newcommands are too hard to parse with regular expressions).

Recent versions of Doconce also offer cross referencing, typically one can define labels below (sub)sections, in figure captions, or in equations, and then refer to these later. Entries in an index can be defined and result in an index at the end for the \LaTeX and Sphinx formats. Citations to literature, with an accompanying bibliography in a file, are also supported. The syntax of labels, references, citations, and the bibliography closely resembles that of \LaTeX , making it easy for Doconce documents to be integrated in \LaTeX projects (manuals, books). For further details on functionality and syntax we refer to the `doc/manual/manual.do.txt` file (see the demo page for various formats of this document).

2 From Doconce to Other Formats

Transformation of a Doconce document `mydoc.do.txt` to various other formats applies the script `doconce format`:

Terminal

```
Terminal> doconce format format mydoc.do.txt
```

or just

Terminal

```
Terminal> doconce format format mydoc
```

2.1 Preprocessing

The `preprocess` and `mako` programs are used to preprocess the file, and options to `preprocess` and/or `mako` can be added after the filename. For example,

Terminal

```
Terminal> doconce format latex mydoc -Dextra_sections -DVAR1=5      # preprocess
Terminal> doconce format latex yourdoc extra_sections=True VAR1=5  # mako
```

The variable `FORMAT` is always defined as the current format when running `preprocess` or `mako`. That is, in the last example, `FORMAT` is defined as `latex`. Inside the Doconce document one can then perform format specific actions through tests like `#if FORMAT == "latex"` (for `preprocess`) or `% if FORMAT == "latex":` (for `mako`).

2.2 Removal of inline comments

The command-line arguments `--no-preprocess` and `--no-mako` turn off running `preprocess` and `mako`, respectively.

Inline comments in the text are removed from the output by

Terminal

```
Terminal> doconce format latex mydoc --skip_inline_comments
```

One can also remove all such comments from the original Doconce file by running:

```
Terminal> doconce remove_inline_comments mydoc
```

This action is convenient when a Doconce document reaches its final form and comments by different authors should be removed.

2.3 HTML

Making an HTML version of a Doconce file `mydoc.do.txt` is performed by

Terminal

```
Terminal> doconce format html mydoc
```

The resulting file `mydoc.html` can be loaded into any web browser for viewing.

The HTML style can be defined either in the header of the HTML file or in an external CSS file. The latter is enabled by the command-line argument `--css=filename`. There is a default style with blue headings, and a style with the solarized color palette, specified by the `--html-solarized` command line argument. If there is no file with name `filename` in the `--css=filename` specification, the blue or solarized styles are written to `filename` and linked from the HTML document. You can provide your own style sheet either by replacing the content inside the `style` tags or by specifying a CSS file through the `--css=filename` option.

If the Pygments package (including the `pygmentize` program) is installed, code blocks are typeset with aid of this package. The command-line argument `--no-pygments-html` turns off the use of Pygments and makes code blocks appear with plain (`pre`) HTML tags. The option `--pygments-html-linenos` turns on line numbers in Pygments-formatted code blocks.

The HTML file can be embedded in a template if the Doconce document does not have a title (because then there will be no header and footer in the HTML file). The template file must contain valid HTML code and can have three "slots": `%(title)s` for a title, `%(date)s` for a date, and `%(main)s` for the main body of text, i.e., the Doconce document translated to HTML. The title becomes the first heading in the Doconce document, and the date is extracted from the `DATE:` line, if present. With the template feature one can easily embed


the text in the look and feel of a website. The template can be extracted from the source code of a page at the site; just insert `%(title)s` and `%(date)s` at appropriate places and replace the main bod of text by `%(main)s`. Here is an example:

Terminal

```
Terminal> doconce format html mydoc --html-template=mytemplate.html
```

2.4 Blogs

Doconce can be used for writing blogs provided the blog site accepts raw HTML code. Google's Blogger service (`blogname.blogspot.com`) is particularly well suited since it also allows extensive \LaTeX mathematics via MathJax. Write the blog text as a Doconce document without any title, author, and date. Then generate HTML as described above. Copy the text and paste it into the text area in the blog, making sure the input format is HTML. On Google's Blogger service you can use Doconce to generate blogs with \LaTeX mathematics and pretty (pygmentized) blocks of computer code. See a blog example for details on blogging.



WARNING

In the comments after the blog one cannot paste raw HTML code with MathJax scripts so there is no support for mathematics in the comments.

WordPress (`wordpress.com`) allows raw HTML code in blogs, but has very limited \LaTeX support, basically only formulas. The `--wordpress` option to doconce modifies the HTML code such that all equations are typeset in a way that is acceptable to WordPress. There is a doconce example on blogging with mathematics and code on WordPress.

2.5 Pandoc and Markdown

Output in Pandoc's extended Markdown format results from

Terminal

```
Terminal> doconce format pandoc mydoc
```

The name of the output file is `mydoc.mkd`. From this format one can go to numerous other formats:

Terminal

```
Terminal> pandoc -R -t mediawiki -o mydoc.mwk --toc mydoc.mkd
```

Pandoc supports `latex`, `html`, `odt` (OpenOffice), `docx` (Microsoft Word), `rtf`, `texinfo`, to mention some. The `-R` option makes Pandoc pass raw HTML or \LaTeX to the output format instead of ignoring it, while the `--toc` option generates a table of contents. See the Pandoc documentation for the many features of the `pandoc` program.

Pandoc is useful to go from \LaTeX mathematics to, e.g., HTML or MS Word. There are two ways (experiment to find the best one for your document): `doconce format pandoc` and then translating using `pandoc`, or `doconce format latex`, and then going from \LaTeX to the desired format using `pandoc`. Here is an example on the latter strategy:

Terminal

```
Terminal> doconce format latex mydoc
Terminal> doconce ptex2tex mydoc
Terminal> doconce replace '\Verb!' '\verb!' mydoc.tex
Terminal> pandoc -f latex -t docx -o mydoc.docx mydoc.tex
```

When we go through `pandoc`, only single equations or `align*` environments are well understood.

Note that `Doconce` applies the `Verb` macro from the `fancyvrb` package while `pandoc` only supports the standard `verb` construction for inline verbatim text. Moreover, quite some additional `doconce replace` and `doconce subst` edits might be needed on the `.mkd` or `.tex` files to successfully have mathematics that is well translated to MS Word. Also when going to `reStructuredText` using `Pandoc`, it can be advantageous to go via \LaTeX .

Here is an example where we take a `Doconce` snippet (without title, author, and date), maybe with some unnumbered equations, and quickly generate HTML with mathematics displayed by `MathJax`:

Terminal

```
Terminal> doconce format pandoc mydoc
Terminal> pandoc -t html -o mydoc.html -s --mathjax mydoc.mkd
```

The `-s` option adds a proper header and footer to the `mydoc.html` file. This recipe is a quick way of making HTML notes with (some) mathematics.

2.6 \LaTeX

Making a \LaTeX file `mydoc.tex` from `mydoc.do.txt` is done in two steps:

Step 1. Filter the `doconce` text to a pre- \LaTeX form `mydoc.p.tex` for the `ptex2tex` program (or `doconce ptex2tex`):

Terminal

```
Terminal> doconce format latex mydoc
```

LaTeX-specific commands ("newcommands") in math formulas and similar can be placed in files `newcommands.tex`, `newcommands_keep.tex`, or `newcommands_replace.tex` (see Section 1.3). If these files are present, they are included in the LaTeX document so that your commands are defined.

An option `--latex-printed` makes some adjustments for documents aimed at being printed. For example, links to web resources are associated with a footnote listing the complete web address (URL).

Step 2. Run `ptex2tex` (if you have it) to make a standard LaTeX file,

Terminal

```
Terminal> ptex2tex mydoc
```

In case you do not have `ptex2tex`, you may run a (very) simplified version:

Terminal

```
Terminal> doconce ptex2tex mydoc
```

Note that Doconce generates a `.p.tex` file with some preprocessor macros that can be used to steer certain properties of the LaTeX document. For example, to turn on the Helvetica font instead of the standard Computer Modern font, run

Terminal

```
Terminal> ptex2tex -DHELVETICA mydoc
Terminal> doconce ptex2tex mydoc -DHELVETICA # alternative
```

The title, authors, and date are by default typeset in a non-standard way to enable a nicer treatment of multiple authors having institutions in common. However, the standard LaTeX "maketitle" heading is also available through `-DLATEX_HEADING=traditional`. A separate titlepage can be generated by `-DLATEX_HEADING=titlepage`.

Preprocessor variables to be defined or undefined are

- `BOOK` for the "book" documentclass rather than the standard "article" class (necessary if you apply chapter headings)
- `PALATINO` for the Palatino font
- `HELVETIA` for the Helvetica font
- `A4PAPER` for A4 paper size
- `A6PAPER` for A6 paper size (suitable for reading on small devices)
- `MOVIE15` for using the movie15 LaTeX package to display movies
- `PREAMBLE` to turn the LaTeX preamble on or off (i.e., complete document or document to be included elsewhere)

- MINTED for inclusion of the minted package (which requires latex or pdflatex to be run with the `-shell-escape` option)

The `ptex2tex` tool makes it possible to easily switch between many different fancy formattings of computer or verbatim code in \LaTeX documents. After any `bc!` command in the Doconce source you can insert verbatim block styles as defined in your `.ptex2tex.cfg` file, e.g., `bc sys!` for a terminal session, where `sys` is set to a certain environment in `.ptex2tex.cfg` (e.g., `CodeTerminal`). There are about 40 styles to choose from, and you can easily add new ones.

Also the `doconce ptex2tex` command supports preprocessor directives for processing the `.p.tex` file. The command allows specifications of code environments as well. Here is an example:

Terminal

```
Terminal> doconce ptex2tex mydoc -DLATEX_HEADING=traditional \
-DPALATINO -DA6PAPER \
"sys=\begin{quote}\begin{verbatim}@end{verbatim}\end{quote}" \
fpro=minted fcod=minted shcod=Verbatim envir=ans:nt
```

Note that `@` must be used to separate the begin and end \LaTeX commands, unless only the environment name is given (such as `minted` above, which implies `\begin{minted}{fortran}` and `\end{minted}` as begin and end for blocks inside `bc fpro!` and `ec!`). Specifying `envir=ans:nt` means that all other environments are typeset with the `anslistings.sty` package, e.g., `bc cppcod!` will then result in `\begin{c++}`. If no environments like `sys`, `fpro`, or the common `envir` are defined on the command line, the plain `\begin{verbatim}` and `\end{verbatim}` used.

Step 2b (optional). Edit the `mydoc.tex` file to your needs. For example, you may want to substitute `section` by `section*` to avoid numbering of sections, you may want to insert linebreaks (and perhaps space) in the title, etc. This can be automatically edited with the aid of the `doconce replace` and `doconce subst` commands. The former works with substituting text directly, while the latter performs substitutions using regular expressions. Here are two examples:

Terminal

```
Terminal> doconce replace 'section{' 'section*{' mydoc.tex
Terminal> doconce subst 'title\{(.+)Using (.+)\}' \
'title{\g<1> \\\ [1.5mm] Using \g<2>}' mydoc.tex
```

A lot of tailored fixes to the \LaTeX document can be done by an appropriate set of text replacements and regular expression substitutions. You are anyway encouraged to make a script for generating PDF from the \LaTeX file.

Step 3. Compile `mydoc.tex` and create the PDF file:

Terminal

```
Terminal> latex mydoc
Terminal> latex mydoc
Terminal> makeindex mydoc    # if index
Terminal> bibitem mydoc      # if bibliography
Terminal> latex mydoc
Terminal> dvipdf mydoc
```

If one wishes to run `ptex2tex` and use the minted \LaTeX package for typesetting code blocks (Minted_Python, Minted_Cpp, etc., in `ptex2tex` specified through the `*pro` and `*cod` variables in `.ptex2tex.cfg` or `$HOME/.ptex2tex.cfg`), the minted \LaTeX package is needed. This package is included by running `ptex2tex` with the `-DMINTED` option:

Terminal

```
Terminal> ptex2tex -DMINTED mydoc
```

In this case, `latex` must be run with the `-shell-escape` option:

Terminal

```
Terminal> latex -shell-escape mydoc
Terminal> latex -shell-escape mydoc
Terminal> makeindex mydoc    # if index
Terminal> bibitem mydoc      # if bibliography
Terminal> latex -shell-escape mydoc
Terminal> dvipdf mydoc
```

When running `doconce ptex2tex mydoc envir=minted` (or other minted specifications with `doconce ptex2tex`), the minted package is automatically included so there is no need for the `-DMINTED` option.

2.7 PDFLaTeX

Running `pdflatex` instead of `latex` follows almost the same steps, but the start is

Terminal

```
Terminal> doconce format latex mydoc
```

Then `ptex2tex` is run as explained above, and finally

Terminal

```
Terminal> pdflatex -shell-escape mydoc
Terminal> makeindex mydoc    # if index
Terminal> bibitem mydoc      # if bibliography
Terminal> pdflatex -shell-escape mydoc
```

2.8 Plain ASCII Text

We can go from Doconce "back to" plain untagged text suitable for viewing in terminal windows, inclusion in email text, or for insertion in computer source code:

Terminal

```
Terminal> doconce format plain mydoc.do.txt # results in mydoc.txt
```

2.9 reStructuredText

Going from Doconce to reStructuredText gives a lot of possibilities to go to other formats. First we filter the Doconce text to a reStructuredText file `mydoc.rst`:

Terminal

```
Terminal> doconce format rst mydoc.do.txt
```

We may now produce various other formats:

Terminal

```
Terminal> rst2html.py mydoc.rst > mydoc.html # html
Terminal> rst2latex.py mydoc.rst > mydoc.tex # latex
Terminal> rst2xml.py mydoc.rst > mydoc.xml # XML
Terminal> rst2odt.py mydoc.rst > mydoc.odt # OpenOffice
```

The OpenOffice file `mydoc.odt` can be loaded into OpenOffice and saved in, among other things, the RTF format or the Microsoft Word format. However, it is more convenient to use the program `unoconv` to convert between the many formats OpenOffice supports *on the command line*. Run

Terminal

```
Terminal> unoconv --show
```

to see all the formats that are supported. For example, the following commands take `mydoc.odt` to Microsoft Office Open XML format, classic MS Word format, and PDF:

Terminal

```
Terminal> unoconv -f ooxml mydoc.odt
Terminal> unoconv -f doc mydoc.odt
Terminal> unoconv -f pdf mydoc.odt
```

Remark about Mathematical Typesetting. At the time of this writing, there is no easy way to go from Doconce and \LaTeX mathematics to reST and further to OpenOffice and the "MS Word world". Mathematics is only fully supported by `latex` as output and to a wide extent also supported by the `sphinx` output format. Some links for going from \LaTeX to Word are listed below.

- <http://ubuntuforums.org/showthread.php?t=1033441>
- <http://tug.org/utilities/texconv/textopc.html>
- <http://nileshbansal.blogspot.com/2007/12/latex-to-openofficeword.html>

2.10 Sphinx

Sphinx documents demand quite some steps in their creation. We have automated most of the steps through the `doconce sphinx_dir` command:

```
Terminal
Terminal> doconce sphinx_dir author="authors' names" \
          title="some title" version=1.0 dirname=sphinx_dir \
          theme=mytheme file1 file2 file3 ...
```

The keywords `author`, `title`, and `version` are used in the headings of the Sphinx document. By default, `version` is 1.0 and the script will try to deduce authors and title from the doconce files `file1`, `file2`, etc. that together represent the whole document. Note that none of the individual Doconce files `file1`, `file2`, etc. should include the rest as their union makes up the whole document. The default value of `dirname` is `sphinx-rootdir`. The `theme` keyword is used to set the theme for design of HTML output from Sphinx (the default theme is `'default'`).

With a single-file document in `mydoc.do.txt` one often just runs

```
Terminal
Terminal> doconce sphinx_dir mydoc
```

and then an appropriate Sphinx directory `sphinx-rootdir` is made with relevant files.

The `doconce sphinx_dir` command generates a script `automake_sphinx.py` for compiling the Sphinx document into an HTML document. One can either run `automake_sphinx.py` or perform the steps in the script manually, possibly with necessary modifications. You should at least read the script prior to executing it to have some idea of what is done.

The `doconce sphinx_dir` script copies directories named `figs` or `figures` over to the Sphinx directory so that figures are accessible in the Sphinx compilation. If figures or movies are located in other directories, `automake_sphinx.py` must be edited accordingly. Files, to which there are local links (not `http:` or `file:` URLs), must be placed in the `_static` subdirectory of the Sphinx directory. The utility `doconce sphinxfix_localURLs` is run to check for local links in the Doconce file: for each such link, say `dir1/dir2/myfile.txt` it replaces the link by `_static/myfile.txt` and copies `dir1/dir2/myfile.txt` to a local `_static` directory (in the same directory as the script is run). However, we recommend instead that the writer of the document places files in `_static` or

lets a script do it automatically. The user must copy all `_static/*` files to the `_static` subdirectory of the Sphinx directory. It may be wise to always put files, to which there are local links in the Doconce document, in a `_static` or `_static-name` directory and use these local links. Then links do not need to be modified when creating a Sphinx version of the document.

Doconce comes with a collection of HTML themes for Sphinx documents. These are packed out in the Sphinx directory, the `conf.py` configuration file for Sphinx is edited accordingly, and a script `make-themes.sh` can make HTML documents with one or more themes. For example, to realize the themes `fenics` and `pyramid`, one writes

Terminal

```
Terminal> ./make-themes.sh fenics pyramid
```

The resulting directories with HTML documents are `_build/html_fenics` and `_build/html_pyramid`, respectively. Without arguments, `make-themes.sh` makes all available themes (!).

If it is not desirable to use the autogenerated scripts explained above, here is the complete manual procedure of generating a Sphinx document from a file `mydoc.do.txt`.

Step 1. Translate Doconce into the Sphinx format:

Terminal

```
Terminal> doconce format sphinx mydoc
```

Step 2. Create a Sphinx root directory either manually or by using the interactive `sphinx-quickstart` program. Here is a scripted version of the steps with the latter:

Terminal

```
mkdir sphinx-rootdir
sphinx-quickstart <<EOF
sphinx-rootdir
n
-
Name of My Sphinx Document
Author
version
version
.rst
index
n
y
n
n
n
n
y
```

```
n
n
y
y
y
EOF
```

The autogenerated `conf.py` file may need some edits if you want to specific layout (Sphinx themes) of HTML pages. The `doconce sphinx_dir` generator makes an extended `conv.py` file where, among other things, several useful Sphinx extensions are included.

Step 3. Copy the `mydoc.rst` file to the Sphinx root directory:

```
Terminal
Terminal> cp mydoc.rst sphinx-rootdir
```

If you have figures in your document, the relative paths to those will be invalid when you work with `mydoc.rst` in the `sphinx-rootdir` directory. Either edit `mydoc.rst` so that figure file paths are correct, or simply copy your figure directories to `sphinx-rootdir`. Links to local files in `mydoc.rst` must be modified to links to files in the `_static` directory, see comment above.

Step 4. Edit the generated `index.rst` file so that `mydoc.rst` is included, i.e., add `mydoc` to the `toctree` section so that it becomes

```
.. toctree::
   :maxdepth: 2

   mydoc
```

(The spaces before `mydoc` are important!)

Step 5. Generate, for instance, an HTML version of the Sphinx source:

```
Terminal
make clean    # remove old versions
make html
```

Sphinx can generate a range of different formats: standalone HTML, HTML in separate directories with `index.html` files, a large single HTML file, JSON files, various help files (the `qthelp`, `HTML`, and `Devhelp` projects), `epub`, `LaTeX`, PDF (via `LaTeX`), pure text, man pages, and Texinfo files.

Step 6. View the result:

Terminal

```
Terminal> firefox _build/html/index.html
```

Note that verbatim code blocks can be typeset in a variety of ways depending the argument that follows `bcl`: `cod` gives Python (`code-block:: python` in Sphinx syntax) and `cppcod` gives C++, but all such arguments can be customized both for Sphinx and \LaTeX output.

2.11 Wiki Formats

There are many different wiki formats, but Doconce only supports three: Googlecode wiki, MediaWiki, and Creole Wiki. These formats are called `gwiki`, `mwiki`, and `cwiki`, respectively. Transformation from Doconce to these formats is done by

Terminal

```
Terminal> doconce format gwiki mydoc.do.txt
Terminal> doconce format mwiki mydoc.do.txt
Terminal> doconce format cwiki mydoc.do.txt
```

The produced MediaWiki can be tested in the sandbox of wikibooks.org. The format works well with Wikipedia, Wikibooks, and ShoutWiki, but not always well elsewhere (see this example).

Large MediaWiki documents can be made with the Book creator. From the MediaWiki format one can go to other formats with aid of `mwlib`. This means that one can easily use Doconce to write Wikibooks and publish these in PDF and MediaWiki format, while at the same time, the book can also be published as a standard \LaTeX book, a Sphinx web document, or a collection of HTML files.

The Googlecode wiki document, `mydoc.gwiki`, is most conveniently stored in a directory which is a clone of the wiki part of the Googlecode project. This is far easier than copying and pasting the entire text into the wiki editor in a web browser.

When the Doconce file contains figures, each figure filename must in the `.gwiki` file be replaced by a URL where the figure is available. There are instructions in the file for doing this. Usually, one performs this substitution automatically (see next section).

2.12 Tweaking the Doconce Output

Occasionally, one would like to tweak the output in a certain format from Doconce. One example is figure filenames when transforming Doconce to `reStructuredText`. Since Doconce does not know if the `.rst` file is going to be filtered to \LaTeX or HTML, it cannot know if `.eps` or `.png` is the most appropriate image filename. The solution is to use a text substitution command or code

with, e.g., `sed`, `perl`, `python`, or `scitools subst`, to automatically edit the output file from Doconce. It is then wise to run Doconce and the editing commands from a script to automate all steps in going from Doconce to the final format(s). The `make.sh` files in `docs/manual` and `docs/tutorial` constitute comprehensive examples on how such scripts can be made.

2.13 Demos

The current text is generated from a Doconce format stored in the file

```
docs/tutorial/tutorial.do.txt
```

The file `make.sh` in the `tutorial` directory of the Doconce source code contains a demo of how to produce a variety of formats. The source of this tutorial, `tutorial.do.txt` is the starting point. Running `make.sh` and studying the various generated files and comparing them with the original `tutorial.do.txt` file, gives a quick introduction to how Doconce is used in a real case. Here is a sample of how this tutorial looks in different formats.

There is another demo in the `docs/manual` directory which translates the more comprehensive documentation, `manual.do.txt`, to various formats. The `make.sh` script runs a set of translations.

3 Installation of Doconce and its Dependencies

3.1 Doconce

Doconce itself is pure Python code hosted at <http://code.google.com/p/doconce>. Its installation from the Mercurial (`hg`) source follows the standard procedure:

Terminal

```
# Doconce
hg clone https://code.google.com/p/doconce/ doconce
cd doconce
sudo python setup.py install
cd ..
```

Since Doconce is frequently updated, it is recommended to use the above procedure and whenever a problem occurs, make sure to update to the most recent version:

Terminal

```
cd doconce
hg pull
hg update
sudo python setup.py install
```

Debian GNU/Linux users can also run

Terminal

```
sudo apt-get install doconce
```

This installs the latest release and not the most updated and bugfixed version. On Ubuntu one needs to run

Terminal

```
sudo add-apt-repository ppa:scitools/ppa
sudo apt-get update
sudo apt-get install doconce
```

3.2 Dependencies

Preprocessors. If you make use of the Preprocess preprocessor, this program must be installed:

Terminal

```
svn checkout http://preprocess.googlecode.com/svn/trunk/ preprocess
cd preprocess
cd doconce
sudo python setup.py install
cd ..
```

A much more advanced alternative to Preprocess is Mako. Its installation is most conveniently done by pip,

Terminal

```
pip install Mako
```

This command requires pip to be installed. On Debian Linux systems, such as Ubuntu, the installation is simply done by

Terminal

```
sudo apt-get install python-pip
```

Alternatively, one can install from the pip source code.

Mako can also be installed directly from source: download the tarball, pack it out, go to the directory and run the usual `sudo python setup.py install`.

Image file handling. Different output formats require different formats of image files. For example, PostScript or Encapsulated PostScript is required for latex output, while HTML needs JPEG, GIF, or PNG formats. Doconce calls up programs from the ImageMagick suite for converting image files to a proper format if needed. The ImageMagick suite can be installed on all major platforms. On Debian Linux (including Ubuntu) systems one can simply write

Terminal

```
sudo apt-get install imagemagick
```

The convenience program `doconce combine_images`, for combining several images into one, will use `montage` and `convert` from ImageMagick and the `pdftk`, `pdfnup`, and `pdfcrop` programs from the `texlive-extra-utils` Debian package. The latter gets installed by

Terminal

```
sudo apt-get install texlive-extra-utils
```

Spellcheck. The utility `doconce spellcheck` applies the `ispell` program for spellcheck. On Debian (including Ubuntu) it is installed by

Terminal

```
sudo apt-get install ispell
```

Ptex2tex for L^AT_EX Output. To make L^AT_EX documents with very flexible choice of typesetting of verbatim code blocks you need `ptex2tex`, which is installed by

Terminal

```
svn checkout http://ptex2tex.googlecode.com/svn/trunk/ ptex2tex
cd ptex2tex
sudo python setup.py install
```

It may happen that you need additional style files, you can run a script, `cp2texmf.sh`:

Terminal

```
cd latex
sh cp2texmf.sh # copy stylefiles to ~/texmf directory
cd ../..
```

This script copies some special stylefiles that that `ptex2tex` potentially makes use of. Some more standard stylefiles are also needed. These are installed by

Terminal

```
sudo apt-get install texlive-latex-recommended texlive-latex-extra
```

on Debian Linux (including Ubuntu) systems. TeXShop on Mac comes with the necessary stylefiles (if not, they can be found by googling and installed manually in the `~/texmf/tex/latex/misc` directory).

Note that the `doconce ptex2tex` command, which needs no installation beyond Doconce itself, can be used as a simpler alternative to the `ptex2tex` program.

The *minted* L^AT_EX style is offered by `ptex2tex` and `doconce ptext2tex` and popular among many users. This style requires the package Pygments to be installed. On Debian Linux,

Terminal

```
sudo apt-get install python-pygments
```

Alternatively, the package can be installed manually:

Terminal

```
hg clone ssh://hg@bitbucket.org/birkenfeld/pygments-main pygments
cd pygments
sudo python setup.py install
```

If you use the *minted* style together with `ptex2tex`, you have to enable it by the `-DMINTED` command-line argument to `ptex2tex`. This is not necessary if you run the alternative `doconce ptex2tex` program.

All use of the *minted* style requires the `-shell-escape` command-line argument when running L^AT_EX, i.e., `latex -shell-escape` or `pdflatex -shell-escape`.

reStructuredText (reST) Output. The `rst` output from Doconce allows further transformation to L^AT_EX, HTML, XML, OpenOffice, and so on, through the `docutils` package. The installation of the most recent version can be done by

Terminal

```
svn checkout http://docutils.svn.sourceforge.net/svnroot/docutils/trunk/docutils
cd docutils
sudo python setup.py install
cd ..
```

To use the OpenOffice suite you will typically on Debian systems install

Terminal

```
sudo apt-get install unovonv libreoffice libreoffice-dmaths
```

There is a possibility to create PDF files from reST documents using ReportLab instead of L^AT_EX. The enabling software is `rst2pdf`. Either download the tarball or clone the svn repository, go to the `rst2pdf` directory and run the usual `sudo python setup.py install`.

Output to `sphinx` requires of course the Sphinx software, installed by

Terminal

```
hg clone https://bitbucket.org/birkenfeld/sphinx
cd sphinx
sudo python setup.py install
cd ..
```

Markdown and Pandoc Output. The Doconce format pandoc outputs the document in the Pandoc extended Markdown format, which via the pandoc program can be translated to a range of other formats. Installation of Pandoc, written in Haskell, is most easily done by

Terminal

```
sudo apt-get install pandoc
```

on Debian (Ubuntu) systems.

Epydoc Output. When the output format is epydoc one needs that program too, installed by

Terminal

```
svn co https://epydock.svn.sourceforge.net/svnroot/epydock/trunk/epydock epydoc
cd epydoc
sudo make install
cd ..
```

Remark. Several of the packages above installed from source code are also available in Debian-based system through the `apt-get install` command. However, we recommend installation directly from the version control system repository as there might be important updates and bug fixes. For `svn` directories, go to the directory, run `svn update`, and then `sudo python setup.py install`. For Mercurial (`hg`) directories, go to the directory, run `hg pull`; `hg update`, and then `sudo python setup.py install`.

Doconce: Document Once, Include Anywhere

Author: Hans Petter Langtangen

Date: Jan 30, 2013

- When writing a note, report, manual, etc., do you find it difficult to choose the typesetting format? That is, to choose between plain (email-like) text, wiki, Word/OpenOffice, LaTeX, HTML, reStructuredText, Sphinx, XML, etc. Would it be convenient to start with some very simple text-like format that easily converts to the formats listed above, and then at some later stage eventually go with a particular format?
- Do you need to write documents in varying formats but find it difficult to remember all the typesetting details of various formats like [LaTeX](#), [HTML](#), [reStructuredText](#), [Sphinx](#), and [wiki](#)? Would it be convenient to generate the typesetting details of a particular format from a very simple text-like format with minimal tagging?
- Do you have the same information scattered around in different documents in different typesetting formats? Would it be a good idea to write things once, in one format, stored in one place, and include it anywhere?

If any of these questions are of interest, you should keep on reading.

What Does Doconce Look Like?

Doconce text looks like ordinary text, but there are some almost invisible text constructions that allow you to control the formatting. Here are some examples.

- Bullet lists arise from lines starting with `*`.
- *Emphasized words* are surrounded by `*`.
- **Words in boldface** are surrounded by underscores.
- Words from computer code are enclosed in back quotes and then typeset `verbatim` (in a monospace font).
- Section headings are recognized by equality (=) signs before and after the title, and the number of = signs indicates the level of the section: 7 for main section, 5 for subsection, and 3 for subsubsection.
- Paragraph headings are recognized by a double underscore before and after the heading.
- The abstract of a document starts with *Abstract* as paragraph heading, and all text up to the next heading makes up the abstract,
- Blocks of computer code can easily be included by placing `!bc` (begin code) and `!ec` (end code) commands at separate lines before and after the code block.
- Blocks of computer code can also be imported from source files.
- Blocks of LaTeX mathematics can easily be included by placing `!bt` (begin TeX) and `!et` (end TeX) commands at separate lines before and after the math block.

- There is support for both LaTeX and text-like inline mathematics.
- Figures and movies with captions, simple tables, URLs with links, index list, labels and references are supported.
- Invisible comments in the output format can be inserted throughout the text.
- Visible comments can be inserted so that authors and readers can comment upon the text (and at any time turn on/off output of such comments).
- There is an exercise environment with many advanced features.
- With a preprocessor, Preprocess or Mako, one can include other documents (files) and large portions of text can be defined in or out of the text.
- With Mako one can also have Python code embedded in the Doconce document and thereby parameterize the text (e.g., one text can describe programming in two languages).

Here is an example of some simple text written in the Doconce format:

```
===== A Subsection with Sample Text =====
label{my:first:sec}
```

Ordinary text looks like ordinary text, and the tags used for `_boldface_` words, `*emphasized*` words, and `'computer'` words look natural in plain text. Lists are typeset as you would do in email,

```
* item 1
* item 2
* item 3
```

Lists can also have automatically numbered items instead of bullets,

```
o item 1
o item 2
o item 3
```

URLs with a link word are possible, as in `"hpl": "http://folk.uio.no/hpl"`. If the word is URL, the URL itself becomes the link name, as in `"URL": "tutorial.do.txt"`.

References to sections may use logical names as labels (e.g., a `"label"` command right after the section title), as in the reference to Section `ref{my:first:sec}`.

Doconce also allows inline comments of the form `[name: comment]` (with a space after `'name:'`), e.g., such as `[hpl: here I will make some remarks to the text]`. Inline comments can be removed from the output by a command-line argument (see Section `ref{doconce2formats}` for an example).

Tables are also supported, e.g.,

```
|-----|
|time   | velocity | acceleration |
|---r---r---r---|
| 0.0   | 1.4186   | -5.01        |
| 2.0   | 1.376512 | 11.919       |
| 4.0   | 1.1E+1   | 14.717624    |
|-----|
```

lines beginning with # are comment lines

The Doconce text above results in the following little document:

A Subsection with Sample Text

Ordinary text looks like ordinary text, and the tags used for **boldface** words, *emphasized* words, and `computer` words look natural in plain text. Lists are typeset as you would do in an email,

- item 1
- item 2
- item 3

Lists can also have numbered items instead of bullets, just use an `o` (for ordered) instead of the asterisk:

1. item 1
2. item 2
3. item 3

URLs with a link word are possible, as in [hpl](#). If the word is URL, the URL itself becomes the link name, as in [tutorial.do.txt](#).

References to sections may use logical names as labels (e.g., a “label” command right after the section title), as in the reference to the section A Subsection with Sample Text.

Doconce also allows inline comments such as (**hpl**: here I will make some remarks to the text) for allowing authors to make notes. Inline comments can be removed from the output by a command-line argument (see the section From Doconce to Other Formats for an example).

Tables are also supported, e.g.,

time	velocity	acceleration
0.0	1.4186	-5.01
2.0	1.376512	11.919
4.0	1.1E+1	14.717624

Mathematics and Computer Code

Inline mathematics, such as $v = \sin(x)$, allows the formula to be specified both as LaTeX and as plain text. This results in a professional LaTeX typesetting, but in other formats the text version normally looks better than raw LaTeX mathematics with backslashes. An inline formula like $v = \sin(x)$ is typeset as:

```
$\nu = \sin(x)$| $v = \sin(x)$ $
```

The pipe symbol acts as a delimiter between LaTeX code and the plain text version of the formula. If you write a lot of mathematics, only the output formats `latex`, `pdflatex`, `html`, `sphinx`, and `pandoc` are of interest and all these support inline LaTeX mathematics so then you will naturally drop the pipe symbol and write just:

```
$\nu = \sin(x)$
```

However, if you want more textual formats, like plain text or reStructuredText, the text after the pipe symbol may help to make the math formula more readable if there are backslashes or other special LaTeX symbols in the LaTeX code.

Blocks of mathematics are typeset with raw LaTeX, inside `!bt` and `!et` (begin TeX, end TeX) instructions:

```
!bt
\begin{align}
\{\partial u \over \partial t\} &= \nabla^2 u + f, \text{label{myeq1}} \\
\{\partial v \over \partial t\} &= \nabla \cdot (q(u) \nabla v) + g \\
\end{align}
!et
```

The result looks like this:

```
\begin{align}
\{\partial u \over \partial t\} &= \nabla^2 u + f, \text{label{myeq1}} \\
\{\partial v \over \partial t\} &= \nabla \cdot (q(u) \nabla v) + g \\
\end{align}
```

Of course, such blocks only looks nice in formats with support for LaTeX mathematics, and here the `align` environment in particular (this includes `latex`, `pdflatex`, `html`, and `sphinx`). The raw LaTeX syntax appears in simpler formats, but can still be useful for those who can read LaTeX syntax.

You can have blocks of computer code, starting and ending with `!bc` and `!ec` instructions, respectively:

```
!bc pycod
from math import sin, pi
def myfunc(x):
    return sin(pi*x)

import integrate
I = integrate.trapezoidal(myfunc, 0, pi, 100)
!ec
```

Such blocks are formatted as:


```

from math import sin, pi
def myfunc(x):
    return sin(pi*x)

import integrate
I = integrate.trapezoidal(myfunc, 0, pi, 100)

```

A code block must come after some plain sentence (at least for successful output to sphinx, rst, and ASCII-close formats), not directly after a section/paragraph heading or a table.

One can also copy computer code directly from files, either the complete file or specified parts. Computer code is then never duplicated in the documentation (important for the principle of avoiding copying information!).

Another document can be included by writing `# #include "mynote.do.txt"` at the beginning of a line. Doconce documents have extension `do.txt`. The `do` part stands for doconce, while the trailing `.txt` denotes a text document so that editors gives you plain text editing capabilities.

Macros (Newcommands), Cross-References, Index, and Bibliography

Doconce supports a type of macros via a LaTeX-style *newcommand* construction. The newcommands defined in a file with name `newcommand_replace.tex` are expanded when Doconce is filtered to other formats, except for LaTeX (since LaTeX performs the expansion itself). Newcommands in files with names `newcommands.tex` and `newcommands_keep.tex` are kept unaltered when Doconce text is filtered to other formats, except for the Sphinx format. Since Sphinx understands LaTeX math, but not newcommands if the Sphinx output is HTML, it makes most sense to expand all newcommands. Normally, a user will put all newcommands that appear in math blocks surrounded by `!bt` and `!et` in `newcommands_keep.tex` to keep them unchanged, at least if they contribute to make the raw LaTeX math text easier to read in the formats that cannot render LaTeX. Newcommands used elsewhere throughout the text will usually be placed in `newcommands_replace.tex` and expanded by Doconce. The definitions of newcommands in the `newcommands*.tex` files *must* appear on a single line (multi-line newcommands are too hard to parse with regular expressions).

Recent versions of Doconce also offer cross referencing, typically one can define labels below (sub)sections, in figure captions, or in equations, and then refer to these later. Entries in an index can be defined and result in an index at the end for the LaTeX and Sphinx formats. Citations to literature, with an accompanying bibliography in a file, are also supported. The syntax of labels, references, citations, and the bibliography closely resembles that of LaTeX, making it easy for Doconce documents to be integrated in LaTeX projects (manuals, books). For further details on functionality and syntax we refer to the `doc/manual/manual.do.txt` file (see the [demo page](#) for various formats of this document).

From Doconce to Other Formats

Transformation of a Doconce document `mydoc.do.txt` to various other formats applies the script `doconce format:`

```
Terminal> doconce format format mydoc.do.txt
```

or just:

```
Terminal> doconce format format mydoc
```

Preprocessing

The `preprocess` and `mako` programs are used to preprocess the file, and options to `preprocess` and/or `mako` can be added after the filename. For example:

```
Terminal> doconce format latex mydoc -Dextra_sections -DVAR1=5      # preprocess
Terminal> doconce format latex yourdoc extra_sections=True VAR1=5  # mako
```

The variable `FORMAT` is always defined as the current format when running `preprocess` or `mako`. That is, in the last example, `FORMAT` is defined as `latex`. Inside the Doconce document one can then perform format specific actions through tests like `#if FORMAT == "latex"` (for `preprocess`) or `% if FORMAT == "latex":` (for `mako`).

Removal of inline comments

The command-line arguments `--no-preprocess` and `--no-mako` turn off running `preprocess` and `mako`, respectively.

Inline comments in the text are removed from the output by:

```
Terminal> doconce format latex mydoc --skip_inline_comments
```

One can also remove all such comments from the original Doconce file by running:

```
Terminal> doconce remove_inline_comments mydoc
```

This action is convenient when a Doconce document reaches its final form and comments by different authors should be removed.

HTML

Making an HTML version of a Doconce file `mydoc.do.txt` is performed by:

```
Terminal> doconce format html mydoc
```

The resulting file `mydoc.html` can be loaded into any web browser for viewing.

The HTML style can be defined either in the header of the HTML file or in an external CSS file. The latter is enabled by the command-line argument `--css=filename`. There is a default style with blue headings, and a style with the [solarized](#) color palette, specified by the `--html-solarized` command line argument. If there is no file with name `filename` in the `--css=filename` specification, the blue or solarized styles are written to `filename` and linked from the HTML document. You can provide your own style sheet either by replacing the content inside the `style` tags or by specifying a CSS file through the `--css=filename` option.

If the Pygments package (including the `pygmentize` program) is installed, code blocks are typeset with aid of this package. The command-line argument `--no-pygments-html` turns off the use of Pygments and makes code blocks appear with plain (pre) HTML

tags. The option `--pygments-html-linenos` turns on line numbers in Pygments-formatted code blocks.

The HTML file can be embedded in a template if the Doconce document does not have a title (because then there will be no header and footer in the HTML file). The template file must contain valid HTML code and can have three “slots”: `%(title)s` for a title, `%(date)s` for a date, and `%(main)s` for the main body of text, i.e., the Doconce document translated to HTML. The title becomes the first heading in the Doconce document, and the date is extracted from the `DATE:` line, if present. With the template feature one can easily embed the text in the look and feel of a website. The template can be extracted from the source code of a page at the site; just insert `%(title)s` and `%(date)s` at appropriate places and replace the main bod of text by `%(main)s`. Here is an example:

```
Terminal> doconce format html mydoc --html-template=mytemplate.html
```

Blogs

Doconce can be used for writing blogs provided the blog site accepts raw HTML code. Google’s Blogger service (`blogname.blogspot.com`) is particularly well suited since it also allows extensive LaTeX mathematics via MathJax. Write the blog text as a Doconce document without any title, author, and date. Then generate HTML as described above. Copy the text and paste it into the text area in the blog, making sure the input format is HTML. On Google’s Blogger service you can use Doconce to generate blogs with LaTeX mathematics and pretty (pygmentized) blocks of computer code. See a [blog example](#) for details on blogging.

Warning

In the comments after the blog one cannot paste raw HTML code with MathJax scripts so there is no support for mathematics in the comments.

WordPress (`wordpress.com`) allows raw HTML code in blogs, but has very limited LaTeX support, basically only formulas. The `--wordpress` option to `doconce` modifies the HTML code such that all equations are typeset in a way that is acceptable to WordPress. There is a [doconce example](#) on blogging with mathematics and code on WordPress.

Pandoc and Markdown

Output in Pandoc’s extended Markdown format results from:

```
Terminal> doconce format pandoc mydoc
```

The name of the output file is `mydoc.mkd`. From this format one can go to numerous other formats:

```
Terminal> pandoc -R -t mediawiki -o mydoc.mwk --toc mydoc.mkd
```

Pandoc supports `latex`, `html`, `odt` (OpenOffice), `docx` (Microsoft Word), `rtf`, `texinfo`, to mention some. The `-R` option makes Pandoc pass raw HTML or LaTeX to the output format instead of ignoring it, while the `--toc` option generates a table of contents. See the [Pandoc documentation](#) for the many features of the `pandoc` program.

Pandoc is useful to go from LaTeX mathematics to, e.g., HTML or MS Word. There are two ways (experiment to find the best one for your document): `doconce format pandoc` and then translating using `pandoc`, or `doconce format latex`, and then going from LaTeX to the desired format using `pandoc`. Here is an example on the latter strategy:

```
Terminal> doconce format latex mydoc
Terminal> doconce ptex2tex mydoc
Terminal> doconce replace '\Verb!' '\verb!' mydoc.tex
Terminal> pandoc -f latex -t docx -o mydoc.docx mydoc.tex
```

When we go through `pandoc`, only single equations or `align*` environments are well understood.

Note that `Doconce` applies the `Verb` macro from the `fancyvrb` package while `pandoc` only supports the standard `verb` construction for inline verbatim text. Moreover, quite some additional `doconce replace` and `doconce subst` edits might be needed on the `.mkd` or `.tex` files to successfully have mathematics that is well translated to MS Word. Also when going to reStructuredText using `Pandoc`, it can be advantageous to go via LaTeX.

Here is an example where we take a `Doconce` snippet (without title, author, and date), maybe with some unnumbered equations, and quickly generate HTML with mathematics displayed by my MathJax:

```
Terminal> doconce format pandoc mydoc
Terminal> pandoc -t html -o mydoc.html -s --mathjax mydoc.mkd
```

The `-s` option adds a proper header and footer to the `mydoc.html` file. This recipe is a quick way of making HTML notes with (some) mathematics.

LaTeX

Making a LaTeX file `mydoc.tex` from `mydoc.do.txt` is done in two steps: ..

Note: putting code blocks inside a list is not successful in many

Step 1. Filter the `doconce` text to a pre-LaTeX form `mydoc.p.tex` for the `ptex2tex` program (or `doconce ptex2tex`):

```
Terminal> doconce format latex mydoc
```

LaTeX-specific commands (“newcommands”) in math formulas and similar can be placed in files `newcommands.tex`, `newcommands_keep.tex`, or `newcommands_replace.tex` (see the section `Macros (Newcommands)`, `Cross-References`, `Index`, and `Bibliography`). If these files are present, they are included in the LaTeX document so that your commands are defined.

An option `--latex-printed` makes some adjustments for documents aimed at being printed. For example, links to web resources are associated with a footnote listing the complete web address (URL).

Step 2. Run `ptex2tex` (if you have it) to make a standard LaTeX file:

```
Terminal> ptex2tex mydoc
```

In case you do not have `ptex2tex`, you may run a (very) simplified version:

```
Terminal> doconce ptex2tex mydoc
```

Note that Doconce generates a `.p.tex` file with some preprocessor macros that can be used to steer certain properties of the LaTeX document. For example, to turn on the Helvetica font instead of the standard Computer Modern font, run:

```
Terminal> ptex2tex -DHELIVETICA mydoc
Terminal> doconce ptex2tex mydoc -DHELIVETICA # alternative
```

The title, authors, and date are by default typeset in a non-standard way to enable a nicer treatment of multiple authors having institutions in common. However, the standard LaTeX “maketitle” heading is also available through `-DLATEX_HEADING=traditional`. A separate titlepage can be generate by `-DLATEX_HEADING=titlepage`.

Preprocessor variables to be defined or undefined are

- BOOK for the “book” documentclass rather than the standard “article” class (necessary if you apply chapter headings)
- PALATINO for the Palatino font
- HELVETIA for the Helvetica font
- A4PAPER for A4 paper size
- A6PAPER for A6 paper size (suitable for reading on small devices)
- MOVIE15 for using the movie15 LaTeX package to display movies
- PREAMBLE to turn the LaTeX preamble on or off (i.e., complete document or document to be included elsewhere)
- MINTED for inclusion of the minted package (which requires `latex` or `pdflatex` to be run with the `-shell-escape` option)

The `ptex2tex` tool makes it possible to easily switch between many different fancy formattings of computer or verbatim code in LaTeX documents. After any `!bc` command in the Doconce source you can insert verbatim block styles as defined in your `.ptex2tex.cfg` file, e.g., `!bc sys` for a terminal session, where `sys` is set to a certain environment in `.ptex2tex.cfg` (e.g., `CodeTerminal`). There are about 40 styles to choose from, and you can easily add new ones.

Also the `doconce ptex2tex` command supports preprocessor directives for processing the `.p.tex` file. The command allows specifications of code environments as well. Here is an example:

```
Terminal> doconce ptex2tex mydoc -DLATEX_HEADING=traditional \
-DPALATINO -DA6PAPER \
"sys=\begin{quote}\begin{verbatim}@\\end{verbatim}\\end{quote}" \
fpro=minted fcod=minted shcod=Verbatim envr=ans:nt
```

Note that `@` must be used to separate the begin and end LaTeX commands, unless only the environment name is given (such as `minted` above, which implies `\begin{minted}{fortran}` and `\end{minted}` as begin and end for blocks inside `!bc fpro` and `!ec`). Specifying `envr=ans:nt` means that all other environments are typeset with the `anslistings.sty` package, e.g., `!bc cppcod` will then result in `\begin{c++}`. If no environments like `sys`, `fpro`, or the common `envr` are defined on the command line, the plain `\begin{verbatim}` and `\end{verbatim}` used.

Step 2b (optional). Edit the `mydoc.tex` file to your needs. For example, you may want to substitute `section` by `section*` to avoid numbering of sections, you may

want to insert linebreaks (and perhaps space) in the title, etc. This can be automatically edited with the aid of the `doconce replace` and `doconce subst` commands. The former works with substituting text directly, while the latter performs substitutions using regular expressions. Here are two examples:

```
Terminal> doconce replace 'section{' 'section*{' mydoc.tex
Terminal> doconce subst 'title\{(.+)Using (.+)\}' \
'title{\g<1> \\\ [1.5mm] Using \g<2>}' mydoc.tex
```

A lot of tailored fixes to the LaTeX document can be done by an appropriate set of text replacements and regular expression substitutions. You are anyway encouraged to make a script for generating PDF from the LaTeX file.

Step 3. Compile `mydoc.tex` and create the PDF file:

```
Terminal> latex mydoc
Terminal> latex mydoc
Terminal> makeindex mydoc    # if index
Terminal> bibitem mydoc      # if bibliography
Terminal> latex mydoc
Terminal> dvipdf mydoc
```

If one wishes to run `ptex2tex` and use the minted LaTeX package for typesetting code blocks (`Minted_Python`, `Minted_Cpp`, etc., in `ptex2tex` specified through the `*pro` and `*cod` variables in `.ptex2tex.cfg` or `$HOME/.ptex2tex.cfg`), the minted LaTeX package is needed. This package is included by running `ptex2tex` with the `-DMINTED` option:

```
Terminal> ptex2tex -DMINTED mydoc
```

In this case, `latex` must be run with the `-shell-escape` option:

```
Terminal> latex -shell-escape mydoc
Terminal> latex -shell-escape mydoc
Terminal> makeindex mydoc    # if index
Terminal> bibitem mydoc      # if bibliography
Terminal> latex -shell-escape mydoc
Terminal> dvipdf mydoc
```

When running `doconce ptex2tex mydoc envir=minted` (or other minted specifications with `doconce ptex2tex`), the minted package is automatically included so there is no need for the `-DMINTED` option.

PDFLaTeX

Running `pdflatex` instead of `latex` follows almost the same steps, but the start is:

```
Terminal> doconce format latex mydoc
```

Then `ptex2tex` is run as explained above, and finally:

```
Terminal> pdflatex -shell-escape mydoc
Terminal> makeindex mydoc    # if index
Terminal> bibitem mydoc      # if bibliography
Terminal> pdflatex -shell-escape mydoc
```

Plain ASCII Text

We can go from Doconce “back to” plain untagged text suitable for viewing in terminal windows, inclusion in email text, or for insertion in computer source code:

```
Terminal> doconce format plain mydoc.do.txt # results in mydoc.txt
```

reStructuredText

Going from Doconce to reStructuredText gives a lot of possibilities to go to other formats. First we filter the Doconce text to a reStructuredText file `mydoc.rst`:

```
Terminal> doconce format rst mydoc.do.txt
```

We may now produce various other formats:

```
Terminal> rst2html.py mydoc.rst > mydoc.html # html
Terminal> rst2latex.py mydoc.rst > mydoc.tex # latex
Terminal> rst2xml.py mydoc.rst > mydoc.xml # XML
Terminal> rst2odt.py mydoc.rst > mydoc.odt # OpenOffice
```

The OpenOffice file `mydoc.odt` can be loaded into OpenOffice and saved in, among other things, the RTF format or the Microsoft Word format. However, it is more convenient to use the program `unoconv` to convert between the many formats OpenOffice supports *on the command line*. Run:

```
Terminal> unoconv --show
```

to see all the formats that are supported. For example, the following commands take `mydoc.odt` to Microsoft Office Open XML format, classic MS Word format, and PDF:

```
Terminal> unoconv -f ooxml mydoc.odt
Terminal> unoconv -f doc mydoc.odt
Terminal> unoconv -f pdf mydoc.odt
```

Remark about Mathematical Typesetting. At the time of this writing, there is no easy way to go from Doconce and LaTeX mathematics to reST and further to OpenOffice and the “MS Word world”. Mathematics is only fully supported by `latex` as output and to a wide extent also supported by the `sphinx` output format. Some links for going from LaTeX to Word are listed below.

- <http://ubuntuforums.org/showthread.php?t=1033441>
- <http://tug.org/utilities/texconv/textopc.html>
- <http://nileshbansal.blogspot.com/2007/12/latex-to-openofficeword.html>

Sphinx

Sphinx documents demand quite some steps in their creation. We have automated most of the steps through the `doconce sphinx_dir` command:

```
Terminal> doconce sphinx_dir author="authors' names" \
          title="some title" version=1.0 dirname=sphinx_dir \
          theme=mytheme file1 file2 file3 ...
```

The keywords `author`, `title`, and `version` are used in the headings of the Sphinx document. By default, `version` is 1.0 and the script will try to deduce authors and title from the doconce files `file1`, `file2`, etc. that together represent the whole document. Note that none of the individual Doconce files `file1`, `file2`, etc. should include the rest as their union makes up the whole document. The default value of `dirname` is `sphinx-rootdir`. The `theme` keyword is used to set the theme for design of HTML output from Sphinx (the default theme is 'default').

With a single-file document in `mydoc.do.txt` one often just runs:

```
Terminal> doconce sphinx_dir mydoc
```

and then an appropriate Sphinx directory `sphinx-rootdir` is made with relevant files.

The `doconce sphinx_dir` command generates a script `automake_sphinx.py` for compiling the Sphinx document into an HTML document. One can either run `automake_sphinx.py` or perform the steps in the script manually, possibly with necessary modifications. You should at least read the script prior to executing it to have some idea of what is done.

The `doconce sphinx_dir` script copies directories named `figs` or `figures` over to the Sphinx directory so that figures are accessible in the Sphinx compilation. If figures or movies are located in other directories, `automake_sphinx.py` must be edited accordingly. Files, to which there are local links (not `http:` or `file:` URLs), must be placed in the `_static` subdirectory of the Sphinx directory. The utility `doconce sphinxfix_localURLs` is run to check for local links in the Doconce file: for each such link, say `dir1/dir2/myfile.txt` it replaces the link by `_static/myfile.txt` and copies `dir1/dir2/myfile.txt` to a local `_static` directory (in the same directory as the script is run). However, we recommend instead that the writer of the document places files in `_static` or lets a script do it automatically. The user must copy all `_static/*` files to the `_static` subdirectory of the Sphinx directory. It may be wise to always put files, to which there are local links in the Doconce document, in a `_static` or `_static-name` directory and use these local links. Then links do not need to be modified when creating a Sphinx version of the document.

Doconce comes with a collection of HTML themes for Sphinx documents. These are packed out in the Sphinx directory, the `conf.py` configuration file for Sphinx is edited accordingly, and a script `make-themes.sh` can make HTML documents with one or more themes. For example, to realize the themes `fenics` and `pyramid`, one writes:

```
Terminal> ./make-themes.sh fenics pyramid
```

The resulting directories with HTML documents are `_build/html_fenics` and `_build/html_pyramid`, respectively. Without arguments, `make-themes.sh` makes all available themes (!).

If it is not desirable to use the autogenerated scripts explained above, here is the complete manual procedure of generating a Sphinx document from a file `mydoc.do.txt`.

Step 1. Translate Doconce into the Sphinx format:


```
Terminal> doconce format sphinx mydoc
```

Step 2. Create a Sphinx root directory either manually or by using the interactive `sphinx-quickstart` program. Here is a scripted version of the steps with the latter:

```
mkdir sphinx-rootdir
sphinx-quickstart <<EOF
sphinx-rootdir
n
—
Name of My Sphinx Document
Author
version
version
.rst
index
n
Y
n
n
n
n
n
Y
n
n
Y
Y
Y
EOF
```

The autogenerated `conf.py` file may need some edits if you want to specific layout (Sphinx themes) of HTML pages. The `doconce sphinx_dir` generator makes an extended `conv.py` file where, among other things, several useful Sphinx extensions are included.

Step 3. Copy the `mydoc.rst` file to the Sphinx root directory:

```
Terminal> cp mydoc.rst sphinx-rootdir
```

If you have figures in your document, the relative paths to those will be invalid when you work with `mydoc.rst` in the `sphinx-rootdir` directory. Either edit `mydoc.rst` so that figure file paths are correct, or simply copy your figure directories to `sphinx-rootdir`. Links to local files in `mydoc.rst` must be modified to links to files in the `_static` directory, see comment above.

Step 4. Edit the generated `index.rst` file so that `mydoc.rst` is included, i.e., add `mydoc` to the `toctree` section so that it becomes:

```
.. toctree::
   :maxdepth: 2

   mydoc
```

(The spaces before `mydoc` are important!)

Step 5. Generate, for instance, an HTML version of the Sphinx source:

```
make clean    # remove old versions
make html
```

Sphinx can generate a range of different formats: standalone HTML, HTML in separate directories with `index.html` files, a large single HTML file, JSON files, various help files (the `qthelp`, `HTML`, and `Devhelp` projects), `epub`, `LaTeX`, `PDF` (via `LaTeX`), pure text, man pages, and `Texinfo` files.

Step 6. View the result:

```
Terminal> firefox _build/html/index.html
```

Note that verbatim code blocks can be typeset in a variety of ways depending the argument that follows `!bc`: `cod` gives Python (`code-block::python` in Sphinx syntax) and `cppcod` gives C++, but all such arguments can be customized both for Sphinx and `LaTeX` output.

Wiki Formats

There are many different wiki formats, but Doconce only supports three: [Googlecode wiki](#), [MediaWiki](#), and [Creole Wiki](#). These formats are called `gwiki`, `mwiki`, and `cwiki`, respectively. Transformation from Doconce to these formats is done by:

```
Terminal> doconce format gwiki mydoc.do.txt
Terminal> doconce format mwiki mydoc.do.txt
Terminal> doconce format cwiki mydoc.do.txt
```

The produced MediaWiki can be tested in the [sandbox of wikibooks.org](#). The format works well with Wikipedia, Wikibooks, and [ShoutWiki](#), but not always well elsewhere (see [this example](#)).

Large MediaWiki documents can be made with the [Book creator](#). From the MediaWiki format one can go to other formats with aid of [mwlib](#). This means that one can easily use Doconce to write [Wikibooks](#) and publish these in `PDF` and MediaWiki format, while at the same time, the book can also be published as a standard `LaTeX` book, a Sphinx web document, or a collection of `HTML` files.

The Googlecode wiki document, `mydoc.gwiki`, is most conveniently stored in a directory which is a clone of the wiki part of the Googlecode project. This is far easier than copying and pasting the entire text into the wiki editor in a web browser.

When the Doconce file contains figures, each figure filename must in the `.gwiki` file be replaced by a URL where the figure is available. There are instructions in the file for doing this. Usually, one performs this substitution automatically (see next section).

Tweaking the Doconce Output

Occasionally, one would like to tweak the output in a certain format from Doconce. One example is figure filenames when transforming Doconce to `reStructuredText`. Since Doconce does not know if the `.rst` file is going to be filtered to `LaTeX` or `HTML`, it cannot know if `.eps` or `.png` is the most appropriate image filename. The solution is to use a text substitution command or code with, e.g., `sed`, `perl`, `python`, or `scitools subst`, to automatically edit the output file from Doconce. It is then wise to run Doconce

and the editing commands from a script to automate all steps in going from Doconce to the final format(s). The `make.sh` files in `docs/manual` and `docs/tutorial` constitute comprehensive examples on how such scripts can be made.

Demos

The current text is generated from a Doconce format stored in the file:

```
docs/tutorial/tutorial.do.txt
```

The file `make.sh` in the `tutorial` directory of the Doconce source code contains a demo of how to produce a variety of formats. The source of this tutorial, `tutorial.do.txt` is the starting point. Running `make.sh` and studying the various generated files and comparing them with the original `tutorial.do.txt` file, gives a quick introduction to how Doconce is used in a real case. [Here](#) is a sample of how this tutorial looks in different formats.

There is another demo in the `docs/manual` directory which translates the more comprehensive documentation, `manual.do.txt`, to various formats. The `make.sh` script runs a set of translations.

Installation of Doconce and its Dependencies

Doconce

Doconce itself is pure Python code hosted at <http://code.google.com/p/doconce/>. Its installation from the Mercurial (`hg`) source follows the standard procedure:

```
# Doconce
hg clone https://code.google.com/p/doconce/ doconce
cd doconce
sudo python setup.py install
cd ..
```

Since Doconce is frequently updated, it is recommended to use the above procedure and whenever a problem occurs, make sure to update to the most recent version:

```
cd doconce
hg pull
hg update
sudo python setup.py install
```

Debian GNU/Linux users can also run:

```
sudo apt-get install doconce
```

This installs the latest release and not the most updated and bugfixed version. On Ubuntu one needs to run:

```
sudo add-apt-repository ppa:scitools/ppa
sudo apt-get update
sudo apt-get install doconce
```

Dependencies

Preprocessors

If you make use of the [Preprocess](#) preprocessor, this program must be installed:

```
svn checkout http://preprocess.googlecode.com/svn/trunk/ preprocess
cd preprocess
cd doconce
sudo python setup.py install
cd ..
```

A much more advanced alternative to Preprocess is [Mako](#). Its installation is most conveniently done by pip:

```
pip install Mako
```

This command requires pip to be installed. On Debian Linux systems, such as Ubuntu, the installation is simply done by:

```
sudo apt-get install python-pip
```

Alternatively, one can install from the pip [source code](#).

Mako can also be installed directly from [source](#): download the tarball, pack it out, go to the directory and run the usual `sudo python setup.py install`.

Image file handling

Different output formats require different formats of image files. For example, PostScript or Encapsulated PostScript is required for latex output, while HTML needs JPEG, GIF, or PNG formats. Doconce calls up programs from the ImageMagick suite for converting image files to a proper format if needed. The [ImageMagick suite](#) can be installed on all major platforms. On Debian Linux (including Ubuntu) systems one can simply write:

```
sudo apt-get install imagemagick
```

The convenience program `doconce combine_images`, for combining several images into one, will use `montage` and `convert` from ImageMagick and the `pdftk`, `pdfnup`, and `pdfcrop` programs from the `texlive-extra-utils` Debian package. The latter gets installed by:

```
sudo apt-get install texlive-extra-utils
```

Spellcheck

The utility `doconce spellcheck` applies the `ispell` program for spellcheck. On Debian (including Ubuntu) it is installed by:

```
sudo apt-get install ispell
```

Ptex2tex for LaTeX Output

To make LaTeX documents with very flexible choice of typesetting of verbatim code blocks you need [ptex2tex](#), which is installed by:

```
svn checkout http://ptex2tex.googlecode.com/svn/trunk/ ptex2tex
cd ptex2tex
sudo python setup.py install
```

It may happen that you need additional style files, you can run a script, `cp2texmf.sh`:

```
cd latex
sh cp2texmf.sh # copy stylefiles to ~/texmf directory
cd ../../
```

This script copies some special stylefiles that that `ptex2tex` potentially makes use of. Some more standard stylefiles are also needed. These are installed by:

```
sudo apt-get install texlive-latex-recommended texlive-latex-extra
```

on Debian Linux (including Ubuntu) systems. TeXShop on Mac comes with the necessary stylefiles (if not, they can be found by googling and installed manually in the `~/texmf/tex/latex/misc` directory).

Note that the `doconce ptex2tex` command, which needs no installation beyond Doconce itself, can be used as a simpler alternative to the `ptex2tex` program.

The *minted* LaTeX style is offered by `ptex2tex` and `doconce ptext2tex` and popular among many users. This style requires the package [Pygments](#) to be installed. On Debian Linux:

```
sudo apt-get install python-pygments
```

Alternatively, the package can be installed manually:

```
hg clone ssh://hg@bitbucket.org/birkenfeld/pygments-main pygments
cd pygments
sudo python setup.py install
```

If you use the *minted* style together with `ptex2tex`, you have to enable it by the `-DMINTED` command-line argument to `ptex2tex`. This is not necessary if you run the alternative `doconce ptex2tex` program.

All use of the *minted* style requires the `-shell-escape` command-line argument when running LaTeX, i.e., `latex -shell-escape` or `pdflatex -shell-escape`.

reStructuredText (reST) Output

The `rst` output from Doconce allows further transformation to LaTeX, HTML, XML, OpenOffice, and so on, through the [docutils](#) package. The installation of the most recent version can be done by:

```
svn checkout http://docutils.svn.sourceforge.net/svnroot/docutils/trunk/docutils
cd docutils
sudo python setup.py install
cd ..
```

To use the OpenOffice suite you will typically on Debian systems install:

```
sudo apt-get install unovonv libreoffice libreoffice-dmaths
```

There is a possibility to create PDF files from reST documents using ReportLab instead of LaTeX. The enabling software is [rst2pdf](#). Either download the tarball or clone the svn repository, go to the `rst2pdf` directory and run the usual `sudo python setup.py install`.

Output to sphinx requires of course the [Sphinx software](#), installed by:

```
hg clone https://bitbucket.org/birkenfeld/sphinx
cd sphinx
sudo python setup.py install
cd ..
```

Markdown and Pandoc Output

The Doconce format `pandoc` outputs the document in the Pandoc extended Markdown format, which via the `pandoc` program can be translated to a range of other formats. Installation of [Pandoc](#), written in Haskell, is most easily done by:

```
sudo apt-get install pandoc
```

on Debian (Ubuntu) systems.

Epydoc Output

When the output format is epydoc one needs that program too, installed by:

```
svn co https://epydock.svn.sourceforge.net/svnroot/epydock/trunk/epydock epydock
cd epydock
sudo make install
cd ..
```

Remark. Several of the packages above installed from source code are also available in Debian-based system through the `apt-get install` command. However, we recommend installation directly from the version control system repository as there might be important updates and bug fixes. For `svn` directories, go to the directory, run `svn update`, and then `sudo python setup.py install`. For Mercurial (`hg`) directories, go to the directory, run `hg pull`; `hg update`, and then `sudo python setup.py install`.

Doconce: Document Once, Include Anywhere Documentation

Release 1.0

Hans Petter Langtangen

January 30, 2013

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DOCONCE: DOCUMENT ONCE, INCLUDE ANYWHERE

Author Hans Petter Langtangen

Date Jan 30, 2013

- When writing a note, report, manual, etc., do you find it difficult to choose the typesetting format? That is, to choose between plain (email-like) text, wiki, Word/OpenOffice, LaTeX, HTML, reStructuredText, Sphinx, XML, etc. Would it be convenient to start with some very simple text-like format that easily converts to the formats listed above, and then at some later stage eventually go with a particular format?
- Do you need to write documents in varying formats but find it difficult to remember all the typesetting details of various formats like LaTeX, HTML, reStructuredText, Sphinx, and wiki? Would it be convenient to generate the typesetting details of a particular format from a very simple text-like format with minimal tagging?
- Do you have the same information scattered around in different documents in different typesetting formats? Would it be a good idea to write things once, in one format, stored in one place, and include it anywhere?

If any of these questions are of interest, you should keep on reading.

WHAT DOES DOCONCE LOOK LIKE?

Doconce text looks like ordinary text, but there are some almost invisible text constructions that allow you to control the formatting. Here are some examples.

- Bullet lists arise from lines starting with `*`.
- *Emphasized words* are surrounded by `*`.
- **Words in boldface** are surrounded by underscores.
- Words from computer code are enclosed in back quotes and then typeset `verbatim` (in a monospace font).
- Section headings are recognized by equality (=) signs before and after the title, and the number of = signs indicates the level of the section: 7 for main section, 5 for subsection, and 3 for subsubsection.
- Paragraph headings are recognized by a double underscore before and after the heading.
- The abstract of a document starts with *Abstract* as paragraph heading, and all text up to the next heading makes up the abstract.
- Blocks of computer code can easily be included by placing `!bc` (begin code) and `!ec` (end code) commands at separate lines before and after the code block.
- Blocks of computer code can also be imported from source files.
- Blocks of LaTeX mathematics can easily be included by placing `!bt` (begin TeX) and `!et` (end TeX) commands at separate lines before and after the math block.
- There is support for both LaTeX and text-like inline mathematics.
- Figures and movies with captions, simple tables, URLs with links, index list, labels and references are supported.
- Invisible comments in the output format can be inserted throughout the text.
- Visible comments can be inserted so that authors and readers can comment upon the text (and at any time turn on/off output of such comments).
- There is an exercise environment with many advanced features.
- With a preprocessor, Preprocess or Mako, one can include other documents (files) and large portions of text can be defined in or out of the text.
- With Mako one can also have Python code embedded in the Doconce document and thereby parameterize the text (e.g., one text can describe programming in two languages).

Here is an example of some simple text written in the Doconce format:

```
===== A Subsection with Sample Text =====
label{my:first:sec}
```

Ordinary text looks like ordinary text, and the tags used for `_boldface_` words, `*emphasized*` words, and `'computer'` words look natural in plain text. Lists are typeset as you would do in email,

- * item 1
- * item 2
- * item 3

Lists can also have automatically numbered items instead of bullets,

- o item 1
- o item 2
- o item 3

URLs with a link word are possible, as in `"hpl": "http://folk.uio.no/hpl"`. If the word is URL, the URL itself becomes the link name, as in `"URL": "tutorial.do.txt"`.

References to sections may use logical names as labels (e.g., a `"label"` command right after the section title), as in the reference to Section `ref{my:first:sec}`.

Doconce also allows inline comments of the form `[name: comment]` (with a space after `'name:'`), e.g., such as `[hpl: here I will make some remarks to the text]`. Inline comments can be removed from the output by a command-line argument (see Section `ref{doconce2formats}` for an example).

Tables are also supported, e.g.,

```
|-----|
|time  | velocity | acceleration |
|---r-----r-----r-----|
| 0.0  | 1.4186   | -5.01        |
| 2.0  | 1.376512 | 11.919       |
| 4.0  | 1.1E+1   | 14.717624    |
|-----|
```

lines beginning with # are comment lines

The Doconce text above results in the following little document:

2.1 A Subsection with Sample Text

Ordinary text looks like ordinary text, and the tags used for **boldface** words, *emphasized* words, and `computer` words look natural in plain text. Lists are typeset as you would do in an email,

- item 1
- item 2
- item 3

Lists can also have numbered items instead of bullets, just use an `o` (for ordered) instead of the asterisk:

1. item 1
2. item 2
3. item 3

URLs with a link word are possible, as in [hpl](#). If the word is URL, the URL itself becomes the link name, as in [tutorial.do.txt](#).

References to sections may use logical names as labels (e.g., a “label” command right after the section title), as in the reference to the section [A Subsection with Sample Text](#).

Doconce also allows inline comments such as (**hpl**: here I will make some remarks to the text) for allowing authors to make notes. Inline comments can be removed from the output by a command-line argument (see the section [From Doconce to Other Formats](#) for an example).

Tables are also supported, e.g.,

time	velocity	acceleration
0.0	1.4186	-5.01
2.0	1.376512	11.919
4.0	1.1E+1	14.717624

2.2 Mathematics and Computer Code

Inline mathematics, such as $\nu = \sin(x)$, allows the formula to be specified both as LaTeX and as plain text. This results in a professional LaTeX typesetting, but in other formats the text version normally looks better than raw LaTeX mathematics with backslashes. An inline formula like $\nu = \sin(x)$ is typeset as

```
$\nu = \sin(x)$ | $v = \sin(x)$
```

The pipe symbol acts as a delimiter between LaTeX code and the plain text version of the formula. If you write a lot of mathematics, only the output formats `latex`, `pdflatex`, `html`, `sphinx`, and `pandoc` are of interest and all these support inline LaTeX mathematics so then you will naturally drop the pipe symbol and write just

```
$\nu = \sin(x)$
```

However, if you want more textual formats, like plain text or reStructuredText, the text after the pipe symbol may help to make the math formula more readable if there are backslashes or other special LaTeX symbols in the LaTeX code.

Blocks of mathematics are typeset with raw LaTeX, inside `!bt` and `!et` (begin TeX, end TeX) instructions:

```
!bt
\begin{align}
{\partial u \over \partial t} &= \nabla^2 u + f, \text{label{myeq1}} \\
{\partial v \over \partial t} &= \nabla \cdot (q(u) \nabla v) + g
\end{align}
!et
```

The result looks like this:

$$\frac{\partial u}{\partial t} = \nabla^2 u + f, \tag{2.1}$$

$$\frac{\partial v}{\partial t} = \nabla \cdot (q(u) \nabla v) + g$$

Of course, such blocks only looks nice in formats with support for LaTeX mathematics, and here the align environment in particular (this includes `latex`, `pdflatex`, `html`, and `sphinx`). The raw LaTeX syntax appears in simpler formats, but can still be useful for those who can read LaTeX syntax.

You can have blocks of computer code, starting and ending with `!bc` and `!ec` instructions, respectively.

```
!bc pycod
from math import sin, pi
def myfunc(x):
    return sin(pi*x)

import integrate
I = integrate.trapezoidal(myfunc, 0, pi, 100)
!ec
```

Such blocks are formatted as

```
from math import sin, pi
def myfunc(x):
    return sin(pi*x)

import integrate
I = integrate.trapezoidal(myfunc, 0, pi, 100)
```

A code block must come after some plain sentence (at least for successful output to `sphinx`, `rst`, and ASCII-close formats), not directly after a section/paragraph heading or a table.

One can also copy computer code directly from files, either the complete file or specified parts. Computer code is then never duplicated in the documentation (important for the principle of avoiding copying information!).

Another document can be included by writing `#include "mynote.do.txt"` at the beginning of a line. Doconce documents have extension `do.txt`. The `do` part stands for doconce, while the trailing `.txt` denotes a text document so that editors gives you plain text editing capabilities.

2.3 Macros (Newcommands), Cross-References, Index, and Bibliography

Doconce supports a type of macros via a LaTeX-style *newcommand* construction. The newcommands defined in a file with name `newcommand_replace.tex` are expanded when Doconce is filtered to other formats, except for LaTeX (since LaTeX performs the expansion itself). Newcommands in files with names `newcommands.tex` and `newcommands_keep.tex` are kept unaltered when Doconce text is filtered to other formats, except for the Sphinx format. Since Sphinx understands LaTeX math, but not newcommands if the Sphinx output is HTML, it makes most sense to expand all newcommands. Normally, a user will put all newcommands that appear in math blocks surrounded by `!bt` and `!et` in `newcommands_keep.tex` to keep them unchanged, at least if they contribute to make the raw LaTeX math text easier to read in the formats that cannot render LaTeX. Newcommands used elsewhere throughout the text will usually be placed in `newcommands_replace.tex` and expanded by Doconce. The definitions of newcommands in the `newcommands*.tex` files *must* appear on a single line (multi-line newcommands are too hard to parse with regular expressions).

Recent versions of Doconce also offer cross referencing, typically one can define labels below (sub)sections, in figure captions, or in equations, and then refer to these later. Entries in an index can be defined and result in an index at the end for the LaTeX and Sphinx formats. Citations to literature, with an accompanying bibliography in a file, are also supported. The syntax of labels, references, citations, and the bibliography closely resembles that of LaTeX, making it easy for Doconce documents to be integrated in LaTeX projects (manuals, books). For further details on functionality and syntax we refer to the `doc/manual/manual.do.txt` file (see the [demo page](#) for various formats of this document).

FROM DOCONCE TO OTHER FORMATS

Transformation of a Doconce document `mydoc.do.txt` to various other formats applies the script `doconce format`:

```
Terminal> doconce format format mydoc.do.txt
```

or just

```
Terminal> doconce format format mydoc
```

3.1 Preprocessing

The `preprocess` and `mako` programs are used to preprocess the file, and options to `preprocess` and/or `mako` can be added after the filename. For example,

```
Terminal> doconce format latex mydoc -Dextra_sections -DVAR1=5      # preprocess
Terminal> doconce format latex yourdoc extra_sections=True VAR1=5  # mako
```

The variable `FORMAT` is always defined as the current format when running `preprocess` or `mako`. That is, in the last example, `FORMAT` is defined as `latex`. Inside the Doconce document one can then perform format specific actions through tests like `#if FORMAT == "latex"` (for `preprocess`) or `% if FORMAT == "latex":` (for `mako`).

3.2 Removal of inline comments

The command-line arguments `--no-preprocess` and `--no-mako` turn off running `preprocess` and `mako`, respectively.

Inline comments in the text are removed from the output by

```
Terminal> doconce format latex mydoc --skip_inline_comments
```

One can also remove all such comments from the original Doconce file by running:

```
Terminal> doconce remove_inline_comments mydoc
```

This action is convenient when a Doconce document reaches its final form and comments by different authors should be removed.

3.3 HTML

Making an HTML version of a Doconce file `mydoc.do.txt` is performed by

```
Terminal> doconce format html mydoc
```

The resulting file `mydoc.html` can be loaded into any web browser for viewing.

The HTML style can be defined either in the header of the HTML file or in an external CSS file. The latter is enabled by the command-line argument `--css=filename`. There is a default style with blue headings, and a style with the [solarized](#) color palette, specified by the `--html-solarized` command line argument. If there is no file with name `filename` in the `--css=filename` specification, the blue or solarized styles are written to `filename` and linked from the HTML document. You can provide your own style sheet either by replacing the content inside the `style` tags or by specifying a CSS file through the `--css=filename` option.

If the Pygments package (including the `pygmentize` program) is installed, code blocks are typeset with aid of this package. The command-line argument `--no-pygments-html` turns off the use of Pygments and makes code blocks appear with plain (`pre`) HTML tags. The option `--pygments-html-linenos` turns on line numbers in Pygments-formatted code blocks.

The HTML file can be embedded in a template if the Doconce document does not have a title (because then there will be no header and footer in the HTML file). The template file must contain valid HTML code and can have three “slots”: `%(title)s` for a title, `%(date)s` for a date, and `%(main)s` for the main body of text, i.e., the Doconce document translated to HTML. The title becomes the first heading in the Doconce document, and the date is extracted from the `DATE:` line, if present. With the template feature one can easily embed the text in the look and feel of a website. The template can be extracted from the source code of a page at the site; just insert `%(title)s` and `%(date)s` at appropriate places and replace the main bod of text by `%(main)s`. Here is an example:

```
Terminal> doconce format html mydoc --html-template=mytemplate.html
```

3.4 Blogs

Doconce can be used for writing blogs provided the blog site accepts raw HTML code. Google’s Blogger service ([blogname.blogspot.com](#)) is particularly well suited since it also allows extensive LaTeX mathematics via MathJax. Write the blog text as a Doconce document without any title, author, and date. Then generate HTML as described above. Copy the text and paste it into the text area in the blog, making sure the input format is HTML. On Google’s Blogger service you can use Doconce to generate blogs with LaTeX mathematics and pretty (pygmentized) blocks of computer code. See a [blog example](#) for details on blogging.

Warning: In the comments after the blog one cannot paste raw HTML code with MathJax scripts so there is no support for mathematics in the comments.

WordPress ([wordpress.com](#)) allows raw HTML code in blogs, but has very limited LaTeX support, basically only formulas. The `--wordpress` option to `doconce` modifies the HTML code such that all equations are typeset in a way that is acceptable to WordPress. There is a [doconce example](#) on blogging with mathematics and code on WordPress.

3.5 Pandoc and Markdown

Output in Pandoc’s extended Markdown format results from

```
Terminal> doconce format pandoc mydoc
```

The name of the output file is `mydoc.mkd`. From this format one can go to numerous other formats:

```
Terminal> pandoc -R -t mediawiki -o mydoc.mwk --toc mydoc.mkd
```

Pandoc supports `latex`, `html`, `odt` (OpenOffice), `docx` (Microsoft Word), `rtf`, `texinfo`, to mention some. The `-R` option makes Pandoc pass raw HTML or LaTeX to the output format instead of ignoring it, while the `--toc` option generates a table of contents. See the [Pandoc documentation](#) for the many features of the `pandoc` program.

Pandoc is useful to go from LaTeX mathematics to, e.g., HTML or MS Word. There are two ways (experiment to find the best one for your document): `doconce format pandoc` and then translating using `pandoc`, or `doconce format latex`, and then going from LaTeX to the desired format using `pandoc`. Here is an example on the latter strategy:

```
Terminal> doconce format latex mydoc
Terminal> doconce ptex2tex mydoc
Terminal> doconce replace '\Verb!' '\verb!' mydoc.tex
Terminal> pandoc -f latex -t docx -o mydoc.docx mydoc.tex
```

When we go through `pandoc`, only single equations or `align*` environments are well understood.

Note that Doconce applies the `Verb` macro from the `fancyvrb` package while `pandoc` only supports the standard `verb` construction for inline verbatim text. Moreover, quite some additional `doconce replace` and `doconce subst` edits might be needed on the `.mkd` or `.tex` files to successfully have mathematics that is well translated to MS Word. Also when going to reStructuredText using Pandoc, it can be advantageous to go via LaTeX.

Here is an example where we take a Doconce snippet (without title, author, and date), maybe with some unnumbered equations, and quickly generate HTML with mathematics displayed by MathJax:

```
Terminal> doconce format pandoc mydoc
Terminal> pandoc -t html -o mydoc.html -s --mathjax mydoc.mkd
```

The `-s` option adds a proper header and footer to the `mydoc.html` file. This recipe is a quick way of making HTML notes with (some) mathematics.

3.6 LaTeX

Making a LaTeX file `mydoc.tex` from `mydoc.do.txt` is done in two steps: .. Note: putting code blocks inside a list is not successful in many

Step 1. Filter the doconce text to a pre-LaTeX form `mydoc.p.tex` for the `ptex2tex` program (or `doconce ptex2tex`):

```
Terminal> doconce format latex mydoc
```

LaTeX-specific commands (“newcommands”) in math formulas and similar can be placed in files `newcommands.tex`, `newcommands_keep.tex`, or `newcommands_replace.tex` (see the section [Macros \(Newcommands\)](#), [Cross-References](#), [Index](#), and [Bibliography](#)). If these files are present, they are included in the LaTeX document so that your commands are defined.

An option `--latex-printed` makes some adjustments for documents aimed at being printed. For example, links to web resources are associated with a footnote listing the complete web address (URL).

Step 2. Run `ptex2tex` (if you have it) to make a standard LaTeX file,

```
Terminal> ptex2tex mydoc
```

In case you do not have `ptex2tex`, you may run a (very) simplified version:

```
Terminal> doconce ptex2tex mydoc
```

Note that Doconce generates a `.p.tex` file with some preprocessor macros that can be used to steer certain properties of the LaTeX document. For example, to turn on the Helvetica font instead of the standard Computer Modern font, run

```
Terminal> ptex2tex -DHELVETICA mydoc
Terminal> doconce ptex2tex mydoc -DHELVETICA # alternative
```

The title, authors, and date are by default typeset in a non-standard way to enable a nicer treatment of multiple authors having institutions in common. However, the standard LaTeX “maketitle” heading is also available through `-DLATEX_HEADING=traditional`. A separate titlepage can be generated by `-DLATEX_HEADING=titlepage`.

Preprocessor variables to be defined or undefined are

- `BOOK` for the “book” documentclass rather than the standard “article” class (necessary if you apply chapter headings)
- `PALATINO` for the Palatino font
- `HELVETIA` for the Helvetica font
- `A4PAPER` for A4 paper size
- `A6PAPER` for A6 paper size (suitable for reading on small devices)
- `MOVIE15` for using the movie15 LaTeX package to display movies
- `PREAMBLE` to turn the LaTeX preamble on or off (i.e., complete document or document to be included elsewhere)
- `MINTED` for inclusion of the minted package (which requires `latex` or `pdflatex` to be run with the `-shell-escape` option)

The `ptex2tex` tool makes it possible to easily switch between many different fancy formattings of computer or verbatim code in LaTeX documents. After any `!bc` command in the Doconce source you can insert verbatim block styles as defined in your `.ptex2tex.cfg` file, e.g., `!bc sys` for a terminal session, where `sys` is set to a certain environment in `.ptex2tex.cfg` (e.g., `CodeTerminal`). There are about 40 styles to choose from, and you can easily add new ones.

Also the `doconce ptex2tex` command supports preprocessor directives for processing the `.p.tex` file. The command allows specifications of code environments as well. Here is an example:

```
Terminal> doconce ptex2tex mydoc -DLATEX_HEADING=traditional \
-DPALATINO -DA6PAPER \
"sys=\begin{quote}\begin{verbatim}@\\end{verbatim}\\end{quote}" \
fpro=minted fcod=minted shcod=Verbatim envir=ans:nt
```

Note that `@` must be used to separate the begin and end LaTeX commands, unless only the environment name is given (such as `minted` above, which implies `\begin{minted}{fortran}` and `\end{minted}` as begin and end for blocks inside `!bc fpro` and `!ec`). Specifying `envir=ans:nt` means that all other environments are typeset with the `anslistings.sty` package, e.g., `!bc cppcod` will then result in `\begin{c++}`. If no environments like `sys`, `fpro`, or the common `envir` are defined on the command line, the plain `\begin{verbatim}` and `\end{verbatim}` are used.

Step 2b (optional). Edit the `mydoc.tex` file to your needs. For example, you may want to substitute `section` by `section*` to avoid numbering of sections, you may want to insert linebreaks (and perhaps space) in the title, etc. This can be automatically edited with the aid of the `doconce replace` and `doconce subst` commands. The

former works with substituting text directly, while the latter performs substitutions using regular expressions. Here are two examples:

```
Terminal> doconce replace 'section{' 'section*{' mydoc.tex
Terminal> doconce subst 'title\{(.+)Using (.+)\}' \
'title{\g<1> \\\ [1.5mm] Using \g<2>}' mydoc.tex
```

A lot of tailored fixes to the LaTeX document can be done by an appropriate set of text replacements and regular expression substitutions. You are anyway encouraged to make a script for generating PDF from the LaTeX file.

Step 3. Compile mydoc.tex and create the PDF file:

```
Terminal> latex mydoc
Terminal> latex mydoc
Terminal> makeindex mydoc    # if index
Terminal> bibitem mydoc      # if bibliography
Terminal> latex mydoc
Terminal> dvipdf mydoc
```

If one wishes to run ptex2tex and use the minted LaTeX package for typesetting code blocks (Minted_Python, Minted_Cpp, etc., in ptex2tex specified through the `*pro` and `*cod` variables in `.ptex2tex.cfg` or `$HOME/.ptex2tex.cfg`), the minted LaTeX package is needed. This package is included by running ptex2tex with the `-DMINTED` option:

```
Terminal> ptex2tex -DMINTED mydoc
```

In this case, latex must be run with the `-shell-escape` option:

```
Terminal> latex -shell-escape mydoc
Terminal> latex -shell-escape mydoc
Terminal> makeindex mydoc    # if index
Terminal> bibitem mydoc      # if bibliography
Terminal> latex -shell-escape mydoc
Terminal> dvipdf mydoc
```

When running `doconce ptex2tex mydoc envirminted` (or other minted specifications with `doconce ptex2tex`), the minted package is automatically included so there is no need for the `-DMINTED` option.

3.7 PDFLaTeX

Running `pdflatex` instead of `latex` follows almost the same steps, but the start is

```
Terminal> doconce format latex mydoc
```

Then `ptex2tex` is run as explained above, and finally

```
Terminal> pdflatex -shell-escape mydoc
Terminal> makeindex mydoc    # if index
Terminal> bibitem mydoc      # if bibliography
Terminal> pdflatex -shell-escape mydoc
```

3.8 Plain ASCII Text

We can go from Doconce “back to” plain untagged text suitable for viewing in terminal windows, inclusion in email text, or for insertion in computer source code:

```
Terminal> doconce format plain mydoc.do.txt # results in mydoc.txt
```

3.9 reStructuredText

Going from Doconce to reStructuredText gives a lot of possibilities to go to other formats. First we filter the Doconce text to a reStructuredText file `mydoc.rst`:

```
Terminal> doconce format rst mydoc.do.txt
```

We may now produce various other formats:

```
Terminal> rst2html.py mydoc.rst > mydoc.html # html
Terminal> rst2latex.py mydoc.rst > mydoc.tex # latex
Terminal> rst2xml.py mydoc.rst > mydoc.xml # XML
Terminal> rst2odt.py mydoc.rst > mydoc.odt # OpenOffice
```

The OpenOffice file `mydoc.odt` can be loaded into OpenOffice and saved in, among other things, the RTF format or the Microsoft Word format. However, it is more convenient to use the program `unoconv` to convert between the many formats OpenOffice supports *on the command line*. Run

```
Terminal> unoconv --show
```

to see all the formats that are supported. For example, the following commands take `mydoc.odt` to Microsoft Office Open XML format, classic MS Word format, and PDF:

```
Terminal> unoconv -f ooxml mydoc.odt
Terminal> unoconv -f doc mydoc.odt
Terminal> unoconv -f pdf mydoc.odt
```

Remark about Mathematical Typesetting. At the time of this writing, there is no easy way to go from Doconce and LaTeX mathematics to reST and further to OpenOffice and the “MS Word world”. Mathematics is only fully supported by `latex` as output and to a wide extent also supported by the `sphinx` output format. Some links for going from LaTeX to Word are listed below.

- <http://ubuntuforums.org/showthread.php?t=1033441>
- <http://tug.org/utilities/texconv/textopc.html>
- <http://nileshbansal.blogspot.com/2007/12/latex-to-openofficeword.html>

3.10 Sphinx

Sphinx documents demand quite some steps in their creation. We have automated most of the steps through the `doconce sphinx_dir` command:

```
Terminal> doconce sphinx_dir author="authors' names" \
          title="some title" version=1.0 dirname=sphinxdir \
          theme=mytheme file1 file2 file3 ...
```

The keywords `author`, `title`, and `version` are used in the headings of the Sphinx document. By default, `version` is 1.0 and the script will try to deduce authors and title from the doconce files `file1`, `file2`, etc. that together represent the whole document. Note that none of the individual Doconce files `file1`, `file2`, etc. should include the rest as their union makes up the whole document. The default value of `dirname` is `sphinx-rootdir`. The `theme` keyword is used to set the theme for design of HTML output from Sphinx (the default theme is `'default'`).

With a single-file document in `mydoc.do.txt` one often just runs

```
Terminal> doconce sphinx_dir mydoc
```

and then an appropriate Sphinx directory `sphinx-rootdir` is made with relevant files.

The `doconce sphinx_dir` command generates a script `automake_sphinx.py` for compiling the Sphinx document into an HTML document. One can either run `automake_sphinx.py` or perform the steps in the script manually, possibly with necessary modifications. You should at least read the script prior to executing it to have some idea of what is done.

The `doconce sphinx_dir` script copies directories named `figs` or `figures` over to the Sphinx directory so that figures are accessible in the Sphinx compilation. If figures or movies are located in other directories, `automake_sphinx.py` must be edited accordingly. Files, to which there are local links (not `http:` or `file:` URLs), must be placed in the `_static` subdirectory of the Sphinx directory. The utility `doconce sphinxfix_localURLs` is run to check for local links in the Doconce file: for each such link, say `dir1/dir2/myfile.txt` it replaces the link by `_static/myfile.txt` and copies `dir1/dir2/myfile.txt` to a local `_static` directory (in the same directory as the script is run). However, we recommend instead that the writer of the document places files in `_static` or lets a script do it automatically. The user must copy all `_static/*` files to the `_static` subdirectory of the Sphinx directory. It may be wise to always put files, to which there are local links in the Doconce document, in a `_static` or `_static-name` directory and use these local links. Then links do not need to be modified when creating a Sphinx version of the document.

Doconce comes with a collection of HTML themes for Sphinx documents. These are packed out in the Sphinx directory, the `conf.py` configuration file for Sphinx is edited accordingly, and a script `make-themes.sh` can make HTML documents with one or more themes. For example, to realize the themes `fenics` and `pyramid`, one writes

```
Terminal> ./make-themes.sh fenics pyramid
```

The resulting directories with HTML documents are `_build/html_fenics` and `_build/html_pyramid`, respectively. Without arguments, `make-themes.sh` makes all available themes (!).

If it is not desirable to use the autogenerated scripts explained above, here is the complete manual procedure of generating a Sphinx document from a file `mydoc.do.txt`.

Step 1. Translate Doconce into the Sphinx format:

```
Terminal> doconce format sphinx mydoc
```

Step 2. Create a Sphinx root directory either manually or by using the interactive `sphinx-quickstart` program. Here is a scripted version of the steps with the latter:

```
mkdir sphinx-rootdir
sphinx-quickstart <<EOF
sphinx-rootdir
n
—
Name of My Sphinx Document
Author
version
version
.rst
index
n
Y
n
n
n
n
n
```

```
Y
n
n
Y
Y
Y
EOF
```

The autogenerated `conf.py` file may need some edits if you want to specific layout (Sphinx themes) of HTML pages. The `doconce sphinx_dir` generator makes an extended `conf.py` file where, among other things, several useful Sphinx extensions are included.

Step 3. Copy the `mydoc.rst` file to the Sphinx root directory:

```
Terminal> cp mydoc.rst sphinx-rootdir
```

If you have figures in your document, the relative paths to those will be invalid when you work with `mydoc.rst` in the `sphinx-rootdir` directory. Either edit `mydoc.rst` so that figure file paths are correct, or simply copy your figure directories to `sphinx-rootdir`. Links to local files in `mydoc.rst` must be modified to links to files in the `_static` directory, see comment above.

Step 4. Edit the generated `index.rst` file so that `mydoc.rst` is included, i.e., add `mydoc` to the `toctree` section so that it becomes

```
.. toctree::
    :maxdepth: 2

    mydoc
```

(The spaces before `mydoc` are important!)

Step 5. Generate, for instance, an HTML version of the Sphinx source:

```
make clean    # remove old versions
make html
```

Sphinx can generate a range of different formats: standalone HTML, HTML in separate directories with `index.html` files, a large single HTML file, JSON files, various help files (the `qthelp`, `HTML`, and `Devhelp` projects), `epub`, `LaTeX`, `PDF` (via `LaTeX`), `pure text`, `man pages`, and `Texinfo` files.

Step 6. View the result:

```
Terminal> firefox _build/html/index.html
```

Note that verbatim code blocks can be typeset in a variety of ways depending the argument that follows `!bc:` `cod` gives Python (`code-block:: python` in Sphinx syntax) and `cppcod` gives C++, but all such arguments can be customized both for Sphinx and LaTeX output.

3.11 Wiki Formats

There are many different wiki formats, but Doconce only supports three: [Googlecode wiki](#), [MediaWiki](#), and [Creole Wiki](#). These formats are called `gwiki`, `mwiki`, and `cwiki`, respectively. Transformation from Doconce to these formats is done by

```
Terminal> doconce format gwiki mydoc.do.txt
Terminal> doconce format mwiki mydoc.do.txt
Terminal> doconce format cwiki mydoc.do.txt
```

The produced MediaWiki can be tested in the [sandbox of wikibooks.org](#). The format works well with Wikipedia, Wikibooks, and [ShoutWiki](#), but not always well elsewhere (see [this example](#)).

Large MediaWiki documents can be made with the [Book creator](#). From the MediaWiki format one can go to other formats with aid of [mwlib](#). This means that one can easily use Doconce to write [Wikibooks](#) and publish these in PDF and MediaWiki format, while at the same time, the book can also be published as a standard LaTeX book, a Sphinx web document, or a collection of HTML files.

The Googlecode wiki document, `mydoc.gwiki`, is most conveniently stored in a directory which is a clone of the wiki part of the Googlecode project. This is far easier than copying and pasting the entire text into the wiki editor in a web browser.

When the Doconce file contains figures, each figure filename must in the `.gwiki` file be replaced by a URL where the figure is available. There are instructions in the file for doing this. Usually, one performs this substitution automatically (see next section).

3.12 Tweaking the Doconce Output

Occasionally, one would like to tweak the output in a certain format from Doconce. One example is figure filenames when transforming Doconce to reStructuredText. Since Doconce does not know if the `.rst` file is going to be filtered to LaTeX or HTML, it cannot know if `.eps` or `.png` is the most appropriate image filename. The solution is to use a text substitution command or code with, e.g., `sed`, `perl`, `python`, or `scitools subst`, to automatically edit the output file from Doconce. It is then wise to run Doconce and the editing commands from a script to automate all steps in going from Doconce to the final format(s). The `make.sh` files in `docs/manual` and `docs/tutorial` constitute comprehensive examples on how such scripts can be made.

3.13 Demos

The current text is generated from a Doconce format stored in the file

```
docs/tutorial/tutorial.do.txt
```

The file `make.sh` in the `tutorial` directory of the Doconce source code contains a demo of how to produce a variety of formats. The source of this tutorial, `tutorial.do.txt` is the starting point. Running `make.sh` and studying the various generated files and comparing them with the original `tutorial.do.txt` file, gives a quick introduction to how Doconce is used in a real case. [Here](#) is a sample of how this tutorial looks in different formats.

There is another demo in the `docs/manual` directory which translates the more comprehensive documentation, `manual.do.txt`, to various formats. The `make.sh` script runs a set of translations.

INSTALLATION OF DOCONCE AND ITS DEPENDENCIES

4.1 Doconce

Doconce itself is pure Python code hosted at <http://code.google.com/p/doconce>. Its installation from the Mercurial (hg) source follows the standard procedure:

```
# Doconce
hg clone https://code.google.com/p/doconce/ doconce
cd doconce
sudo python setup.py install
cd ..
```

Since Doconce is frequently updated, it is recommended to use the above procedure and whenever a problem occurs, make sure to update to the most recent version:

```
cd doconce
hg pull
hg update
sudo python setup.py install
```

Debian GNU/Linux users can also run

```
sudo apt-get install doconce
```

This installs the latest release and not the most updated and bugfixed version. On Ubuntu one needs to run

```
sudo add-apt-repository ppa:scitools/ppa
sudo apt-get update
sudo apt-get install doconce
```

4.2 Dependencies

4.2.1 Preprocessors

If you make use of the [Preprocess](#) preprocessor, this program must be installed:

```
svn checkout http://preprocess.googlecode.com/svn/trunk/ preprocess
cd preprocess
cd doconce
```

```
sudo python setup.py install
cd ..
```

A much more advanced alternative to Preprocess is [Mako](#). Its installation is most conveniently done by `pip`,

```
pip install Mako
```

This command requires `pip` to be installed. On Debian Linux systems, such as Ubuntu, the installation is simply done by

```
sudo apt-get install python-pip
```

Alternatively, one can install from the `pip` [source code](#).

Mako can also be installed directly from [source](#): download the tarball, pack it out, go to the directory and run the usual

```
sudo python setup.py install.
```

4.2.2 Image file handling

Different output formats require different formats of image files. For example, PostScript or Encapsulated PostScript is required for `latex` output, while HTML needs JPEG, GIF, or PNG formats. Doconce calls up programs from the ImageMagick suite for converting image files to a proper format if needed. The [ImageMagick suite](#) can be installed on all major platforms. On Debian Linux (including Ubuntu) systems one can simply write

```
sudo apt-get install imagemagick
```

The convenience program `doconce combine_images`, for combining several images into one, will use `montage` and `convert` from ImageMagick and the `pdftk`, `pdfnup`, and `pdfcrop` programs from the `texlive-extra-utils` Debian package. The latter gets installed by

```
sudo apt-get install texlive-extra-utils
```

4.2.3 Spellcheck

The utility `doconce spellcheck` applies the `ispell` program for spellcheck. On Debian (including Ubuntu) it is installed by

```
sudo apt-get install ispell
```

4.2.4 Ptex2tex for LaTeX Output

To make LaTeX documents with very flexible choice of typesetting of verbatim code blocks you need [ptex2tex](#), which is installed by

```
svn checkout http://ptex2tex.googlecode.com/svn/trunk/ ptex2tex
cd ptex2tex
sudo python setup.py install
```

It may happen that you need additional style files, you can run a script, `cp2texmf.sh`:

```
cd latex
sh cp2texmf.sh # copy stylefiles to ~/texmf directory
cd ../../
```

This script copies some special stylefiles that that `ptex2tex` potentially makes use of. Some more standard stylefiles are also needed. These are installed by

```
sudo apt-get install texlive-latex-recommended texlive-latex-extra
```

on Debian Linux (including Ubuntu) systems. TeXShop on Mac comes with the necessary stylefiles (if not, they can be found by googling and installed manually in the `~/texmf/tex/latex/misc` directory).

Note that the `doconce ptex2tex` command, which needs no installation beyond Doconce itself, can be used as a simpler alternative to the `ptex2tex` program.

The *minted* LaTeX style is offered by `ptex2tex` and `doconce ptext2tex` and popular among many users. This style requires the package `Pygments` to be installed. On Debian Linux,

```
sudo apt-get install python-pygments
```

Alternatively, the package can be installed manually:

```
hg clone ssh://hg@bitbucket.org/birkenfeld/pygments-main pygments
cd pygments
sudo python setup.py install
```

If you use the *minted* style together with `ptex2tex`, you have to enable it by the `-DMINTED` command-line argument to `ptex2tex`. This is not necessary if you run the alternative `doconce ptex2tex` program.

All use of the *minted* style requires the `-shell-escape` command-line argument when running LaTeX, i.e., `latex -shell-escape` or `pdflatex -shell-escape`.

4.2.5 reStructuredText (reST) Output

The `rst` output from Doconce allows further transformation to LaTeX, HTML, XML, OpenOffice, and so on, through the `docutils` package. The installation of the most recent version can be done by

```
svn checkout http://docutils.svn.sourceforge.net/svnroot/docutils/trunk/docutils
cd docutils
sudo python setup.py install
cd ..
```

To use the OpenOffice suite you will typically on Debian systems install

```
sudo apt-get install unovonv libreoffice libreoffice-dmaths
```

There is a possibility to create PDF files from reST documents using ReportLab instead of LaTeX. The enabling software is `rst2pdf`. Either download the tarball or clone the svn repository, go to the `rst2pdf` directory and run the usual `sudo python setup.py install`.

Output to sphinx requires of course the `Sphinx` software, installed by

```
hg clone https://bitbucket.org/birkenfeld/sphinx
cd sphinx
sudo python setup.py install
cd ..
```

4.2.6 Markdown and Pandoc Output

The Doconce format `pandoc` outputs the document in the Pandoc extended Markdown format, which via the `pandoc` program can be translated to a range of other formats. Installation of `Pandoc`, written in Haskell, is most easily done by

```
sudo apt-get install pandoc
```

on Debian (Ubuntu) systems.

4.2.7 Epydoc Output

When the output format is epydoc one needs that program too, installed by

```
svn co https://epydoc.svn.sourceforge.net/svnroot/epydoc/trunk/epydoc epydoc
cd epydoc
sudo make install
cd ..
```

Remark. Several of the packages above installed from source code are also available in Debian-based system through the `apt-get install` command. However, we recommend installation directly from the version control system repository as there might be important updates and bug fixes. For `svn` directories, go to the directory, run `svn update`, and then `sudo python setup.py install`. For Mercurial (`hg`) directories, go to the directory, run `hg pull`; `hg update`, and then `sudo python setup.py install`.

INDICES AND TABLES

- *genindex*
- *modindex*
- *search*

” **tutorial.txt** ”

Doconce: Document Once, Include Anywhere
=====

Hans Petter Langtangen [1, 2]

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Date: Jan 30, 2013

- * When writing a note, report, manual, etc., do you find it difficult to choose the typesetting format? That is, to choose between plain (email-like) text, wiki, Word/OpenOffice, LaTeX, HTML, reStructuredText, Sphinx, XML, etc. Would it be convenient to start with some very simple text-like format that easily converts to the formats listed above, and then at some later stage eventually go with a particular format?
- * Do you need to write documents in varying formats but find it difficult to remember all the typesetting details of various formats like LaTeX (<http://refcards.com/docs/silvermanj/amslatex/LaTeXRefCard.v2.0.pdf>), HTML (<http://www.htmlcodetutorial.com/>), reStructuredText (<http://docutils.sourceforge.net/docs/ref/rst/restructuredtext.html>), Sphinx (<http://sphinx.pocoo.org/contents.html>), and wiki (<http://code.google.com/p/support/wiki/WikiSyntax>)? Would it be convenient to generate the typesetting details of a particular format from a very simple text-like format with minimal tagging?
- * Do you have the same information scattered around in different documents in different typesetting formats? Would it be a good idea to write things once, in one format, stored in one place, and include it anywhere?

If any of these questions are of interest, you should keep on reading.

What Does Doconce Look Like?
=====

Doconce text looks like ordinary text, but there are some almost invisible text constructions that allow you to control the formatting. Here are some examples.

- * Bullet lists arise from lines starting with *.
- * **Emphasized words** are surrounded by *.
- * Words in boldface are surrounded by underscores.
- * Words from computer code are enclosed in back quotes and then typeset verbatim (in a monospace font).
- * Section headings are recognized by equality (=) signs before and after the title, and the number of = signs indicates the level of the section: 7 for main section, 5 for subsection, and 3 for subsubsection.

” **tutorial.txt** ”

- * Paragraph headings are recognized by a double underscore before and after the heading.
- * The abstract of a document starts with `*Abstract*` as paragraph heading, and all text up to the next heading makes up the abstract,
- * Blocks of computer code can easily be included by placing `!bc` (begin code) and `!ec` (end code) commands at separate lines before and after the code block.
- * Blocks of computer code can also be imported from source files.
- * Blocks of LaTeX mathematics can easily be included by placing `!bt` (begin TeX) and `!et` (end TeX) commands at separate lines before and after the math block.
- * There is support for both LaTeX and text-like inline mathematics.
- * Figures and movies with captions, simple tables, URLs with links, index list, labels and references are supported.
- * Invisible comments in the output format can be inserted throughout the text.
- * Visible comments can be inserted so that authors and readers can comment upon the text (and at any time turn on/off output of such comments).
- * There is an exercise environment with many advanced features.
- * With a preprocessor, `Preprocess` or `Mako`, one can include other documents (files) and large portions of text can be defined in or out of the text.
- * With `Mako` one can also have Python code embedded in the Doconce document and thereby parameterize the text (e.g., one text can describe programming in two languages).

Here is an example of some simple text written in the Doconce format::

```
==== A Subsection with Sample Text ====
label{my:first:sec}
```

Ordinary text looks like ordinary text, and the tags used for `_boldface_` words, `*emphasized*` words, and `'computer'` words look natural in plain text. Lists are typeset as you would do in email,

- * item 1
- * item 2
- * item 3

Lists can also have automatically numbered items instead of bullets,

- o item 1
- o item 2
- o item 3

URLs with a link word are possible, as in `"hpl": "http://folk.uio.no/hpl`

" **tutorial.txt** "

".

If the word is URL, the URL itself becomes the link name, as in "URL": "tutorial.do.txt".

References to sections may use logical names as labels (e.g., a "label" command right after the section title), as in the reference to Section `ref{my:first:sec}`.

Doconce also allows inline comments of the form `[name: comment]` (with a space after 'name:'), e.g., such as `[hpl: here I will make some remarks to the text]`. Inline comments can be removed from the output by a command-line argument (see Section `ref{doconce2formats}` for an example).

Tables are also supported, e.g.,

time	velocity	acceleration
0.0	1.4186	-5.01
2.0	1.376512	11.919
4.0	1.1E+1	14.717624

lines beginning with # are comment lines

The Doconce text above results in the following little document:

A Subsection with Sample Text

Ordinary text looks like ordinary text, and the tags used for boldface words, **emphasized** words, and computer words look natural in plain text. Lists are typeset as you would do in an email,

- * item 1
- * item 2
- * item 3

Lists can also have numbered items instead of bullets, just use an o (for ordered) instead of the asterisk:

1. item 1
2. item 2
3. item 3

URLs with a link word are possible, as in hpl (<http://folk.uio.no/hpl>). If the word is URL, the URL itself becomes the link name, as in tutorial.do.txt.

References to sections may use logical names as labels (e.g., a "label" command right after the section title), as in the reference to the section "A Subsection with Sample Text".

Doconce also allows inline comments such as `[hpl: here I will make`

” **tutorial.txt** ”

some remarks to the text] for allowing authors to make notes. Inline comments can be removed from the output by a command-line argument (see the section "From Doconce to Other Formats" for an example).

Tables are also supported, e.g.,

time	velocity	acceleration
0.0	1.4186	-5.01
2.0	1.376512	11.919
4.0	1.1E+1	14.717624

Mathematics and Computer Code

Inline mathematics, such as $v = \sin(x)$, allows the formula to be specified both as LaTeX and as plain text. This results in a professional LaTeX typesetting, but in other formats the text version normally looks better than raw LaTeX mathematics with backslashes. An inline formula like $v = \sin(x)$ is typeset as::

$$\nu = \sin(x) \mid v = \sin(x)$$

The pipe symbol acts as a delimiter between LaTeX code and the plain text version of the formula. If you write a lot of mathematics, only the output formats latex, pdflatex, html, sphinx, and pandoc are of interest

and all these support inline LaTeX mathematics so then you will naturally drop the pipe symbol and write just::

$$\nu = \sin(x)$$

However, if you want more textual formats, like plain text or reStructuredText, the text after the pipe symbol may help to make the math formula more readable if there are backslashes or other special LaTeX symbols in the LaTeX code.

Blocks of mathematics are typeset with raw LaTeX, inside

!bt and !et (begin TeX, end TeX) instructions::

```
!bt
\begin{align}
\{\partial u \over \partial t\} &= \nabla^2 u + f, \text{label{myeq1}} \\
\{\partial v \over \partial t\} &= \nabla \cdot (q(u) \nabla v) + g \\
\end{align}
!et
```

The result looks like this::

```
\begin{align}
\{\partial u \over \partial t\} &= \nabla^2 u + f, \text{label{myeq1}} \\
\{\partial v \over \partial t\} &= \nabla \cdot (q(u) \nabla v) + g \\
\end{align}
```

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Of course, such blocks only looks nice in formats with support for LaTeX mathematics, and here the align environment in particular (this includes latex, pdflatex, html, and sphinx). The raw LaTeX syntax appears in simpler formats, but can still be useful for those who can read LaTeX syntax.

You can have blocks of computer code, starting and ending with !bc and !ec instructions, respectively::

```
!bc pycod
from math import sin, pi
def myfunc(x):
    return sin(pi*x)

import integrate
I = integrate.trapezoidal(myfunc, 0, pi, 100)
!ec
```

Such blocks are formatted as::

```
from math import sin, pi
def myfunc(x):
    return sin(pi*x)

import integrate
I = integrate.trapezoidal(myfunc, 0, pi, 100)
```

A code block must come after some plain sentence (at least for successful output to sphinx, rst, and ASCII-close formats), not directly after a section/paragraph heading or a table.

One can also copy computer code directly from files, either the complete file or specified parts. Computer code is then never duplicated in the documentation (important for the principle of avoiding copying information!).

Another document can be included by writing # #include "mynote.do.txt" at the beginning of a line. Doconce documents have extension do.txt. The do part stands for doconce, while the trailing .txt denotes a text document so that editors gives you plain text editing capabilities.

Macros (Newcommands), Cross-References, Index, and Bibliography

Doconce supports a type of macros via a LaTeX-style `*newcommand*` construction. The newcommands defined in a file with name `newcommand_replace.tex` are expanded when Doconce is filtered to other formats, except for LaTeX (since LaTeX performs the expansion itself). Newcommands in files with names `newcommands.tex` and `newcommands_keep.tex` are kept unaltered when Doconce text is filtered to other formats, except for the Sphinx format. Since Sphinx understands LaTeX math, but not newcommands if the Sphinx output is HTML, it makes most sense to expand all newcommands. Normally, a user will put all newcommands that appear in math blocks surrounded by

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`!bt` and `!et` in `newcommands_keep.tex` to keep them unchanged, at least if they contribute to make the raw LaTeX math text easier to read in the formats that cannot render LaTeX. Newcommands used elsewhere throughout the text will usually be placed in `newcommands_replace.tex` and expanded by Doconce. The definitions of newcommands in the `newcommands*.tex` files *must* appear on a single line (multi-line newcommands are too hard to parse with regular expressions).

Recent versions of Doconce also offer cross referencing, typically one can define labels below (sub)sections, in figure captions, or in equations, and then refer to these later. Entries in an index can be defined and result in an index at the end for the LaTeX and Sphinx formats. Citations to literature, with an accompanying bibliography in a file, are also supported. The syntax of labels, references, citations, and the bibliography closely resembles that of LaTeX, making it easy for Doconce documents to be integrated in LaTeX projects (manuals, books). For further details on functionality and syntax we refer to the `doc/manual/manual.do.txt` file (see the demo page (<https://doconce.googlecode.com/hg/doc/demos/manual/index.html>) for various formats of this document).

From Doconce to Other Formats

=====

Transformation of a Doconce document `mydoc.do.txt` to various other formats applies the script `doconce format::`

```
Terminal> doconce format format mydoc.do.txt
```

or just::

```
Terminal> doconce format format mydoc
```

Preprocessing

The `preprocess` and `mako` programs are used to preprocess the file, and options to preprocess and/or mako can be added after the filename. For example::

```
Terminal> doconce format latex mydoc -Dextra_sections -DVAR1=5      # pre
process
Terminal> doconce format latex yourdoc extra_sections=True VAR1=5  # mak
o
```

The variable `FORMAT` is always defined as the current format when running `preprocess` or `mako`. That is, in the last example, `FORMAT` is defined as `latex`. Inside the Doconce document one can then perform format specific actions through tests like `#if FORMAT == "latex"` (for `preprocess`) or `% if FORMAT == "latex":` (for `mako`).

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tutorial.txt

”

Removal of inline comments

The command-line arguments `--no-preprocess` and `--no-mako` turn off running preprocess and mako, respectively.

Inline comments in the text are removed from the output by::

```
Terminal> doconce format latex mydoc --skip_inline_comments
```

One can also remove all such comments from the original Doconce file by running::

```
Terminal> doconce remove_inline_comments mydoc
```

This action is convenient when a Doconce document reaches its final form and comments by different authors should be removed.

HTML

Making an HTML version of a Doconce file `mydoc.do.txt` is performed by::

```
Terminal> doconce format html mydoc
```

The resulting file `mydoc.html` can be loaded into any web browser for viewing.

The HTML style can be defined either in the header of the HTML file or in an external CSS file. The latter is enabled by the command-line argument `--css=filename`. There is a default style with blue headings, and a style with the solarized (<http://ethanschoonover.com/solarized>) color palette, specified by the `--html-solarized` command line argument. If there is no file with name `filename` in the `--css=filename` specification, the blue or solarized styles are written to `filename` and linked from the HTML document. You can provide your own style sheet either by replacing the content inside the style tags or by specifying a CSS file through the `--css=filename` option.

If the Pygments package (including the `pygmentize` program) is installed, code blocks are typeset with aid of this package. The command-line argument `--no-pygments-html` turns off the use of Pygments and makes code blocks appear with plain (pre) HTML tags. The option `--pygments-html-linenos` turns on line numbers in Pygments-formatted code blocks.

The HTML file can be embedded in a template if the Doconce document does not have a title (because then there will be no header and footer in the HTML file). The template file must contain valid HTML code and can have three "slots": `%(title)s` for a title, `%(date)s` for a date, and `%(main)s` for the main body of text, i.e., the Doconce document translated to HTML. The title becomes the first heading in the Doconce document, and the date is extracted from the `DATE:` line, if present. With the template feature one can easily embed

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the text in the look and feel of a website. The template can be extracted from the source code of a page at the site; just insert `%(title)s` and `%(date)s` at appropriate places and replace the main bod of text by `%(main)s`. Here is an example::

```
Terminal> doconce format html mydoc --html-template=mytemplate.html
```

Blogs

Doconce can be used for writing blogs provided the blog site accepts raw HTML code. Google's Blogger service (blogname.blogspot.com) is particularly well suited since it also allows extensive LaTeX mathematics via MathJax.

Write the blog text as a Doconce document without any title, author, and date. Then generate HTML as described above. Copy the text and paste it into the text area in the blog, making sure the input format is HTML. On Google's Blogger service you can use Doconce to generate blogs with LaTeX mathematics and pretty (pygmentized) blocks of computer code. See a blog example (<http://doconce.blogspot.no>) for details on blogging.

Warning. In the comments after the blog one cannot paste raw HTML code with MathJax scripts so there is no support for mathematics in the comments.

WordPress (wordpress.com) allows raw HTML code in blogs, but has very limited LaTeX support, basically only formulas. The `--wordpress` option to doconce modifies the HTML code such that all equations are typeset in a way that is acceptable to WordPress. There is a doconce example (<http://doconce.wordpress.com>) on blogging with mathematics and code on WordPress.

Pandoc and Markdown

Output in Pandoc's extended Markdown format results from::

```
Terminal> doconce format pandoc mydoc
```

The name of the output file is `mydoc.mkd`.
From this format one can go to numerous other formats::

```
Terminal> pandoc -R -t mediawiki -o mydoc.mwk --toc mydoc.mkd
```

Pandoc supports latex, html, odt (OpenOffice), docx (Microsoft Word), rtf, texinfo, to mention some. The `-R` option makes Pandoc pass raw HTML or LaTeX to the output format instead of ignoring it, while the `--toc` option generates a table of contents. See the Pandoc documentation (<http://johnmacfarlane.net/pandoc/README.html>) for the many features of the pandoc program.

Pandoc is useful to go from LaTeX mathematics to, e.g., HTML or MS Word.

”

”

”

” **tutorial.txt** ”

There are two ways (experiment to find the best one for your document):
doconce format pandoc and then translating using pandoc, or
doconce format latex, and then going from LaTeX to the desired format
using pandoc.

Here is an example on the latter strategy::

```
Terminal> doconce format latex mydoc
Terminal> doconce ptex2tex mydoc
Terminal> doconce replace '\Verb!' '\verb!' mydoc.tex
Terminal> pandoc -f latex -t docx -o mydoc.docx mydoc.tex
```

When we go through pandoc, only single equations or align* environments are well understood.

Note that Doconce applies the Verb macro from the fancyvrb package while pandoc only supports the standard verb construction for inline verbatim text. Moreover, quite some additional doconce replace and doconce subst edits might be needed on the .mkd or .tex files to successfully have mathematics that is well translated to MS Word. Also when going to reStructuredText using Pandoc, it can be advantageous to go via LaTeX.

Here is an example where we take a Doconce snippet (without title, author, and date), maybe with some unnumbered equations, and quickly generate HTML with mathematics displayed my MathJax::

```
Terminal> doconce format pandoc mydoc
Terminal> pandoc -t html -o mydoc.html -s --mathjax mydoc.mkd
```

The -s option adds a proper header and footer to the mydoc.html file. This recipe is a quick way of making HTML notes with (some) mathematics.

LaTeX

Making a LaTeX file mydoc.tex from mydoc.do.txt is done in two steps:

Step 1. Filter the doconce text to a pre-LaTeX form mydoc.p.tex for the ptex2tex program (or doconce ptex2tex)::

```
Terminal> doconce format latex mydoc
```

LaTeX-specific commands ("newcommands") in math formulas and similar can be placed in files newcommands.tex, newcommands_keep.tex, or newcommands_replace.tex (see the section "Macros (Newcommands), Cross-References, Index, and Bibliography").

If these files are present, they are included in the LaTeX document so that your commands are defined.

An option --latex-printed makes some adjustments for documents aimed at being printed. For example, links to web resources are associated with a footnote listing the complete web address (URL).

Step 2. Run ptex2tex (if you have it) to make a standard LaTeX file::

” **tutorial.txt** ”

```
Terminal> ptex2tex mydoc
```

In case you do not have ptex2tex, you may run a (very) simplified version::

```
Terminal> doconce ptex2tex mydoc
```

Note that Doconce generates a .p.tex file with some preprocessor macros that can be used to steer certain properties of the LaTeX document. For example, to turn on the Helvetica font instead of the standard Computer Modern font, run::

```
Terminal> ptex2tex -DHELIVETICA mydoc
```

```
Terminal> doconce ptex2tex mydoc -DHELIVETICA # alternative
```

The title, authors, and date are by default typeset in a non-standard way to enable a nicer treatment of multiple authors having institutions in common. However, the standard LaTeX "maketitle" heading is also available through `-DLATEX_HEADING=traditional`. A separate titlepage can be generate by `-DLATEX_HEADING=titlepage`.

Preprocessor variables to be defined or undefined are

- * BOOK for the "book" documentclass rather than the standard "article" class (necessary if you apply chapter headings)
- * PALATINO for the Palatino font
- * HELVETIA for the Helvetica font
- * A4PAPER for A4 paper size
- * A6PAPER for A6 paper size (suitable for reading on small devices)
- * MOVIE15 for using the movie15 LaTeX package to display movies
- * PREAMBLE to turn the LaTeX preamble on or off (i.e., complete document or document to be included elsewhere)
- * MINTED for inclusion of the minted package (which requires latex or pdflatex to be run with the `-shell-escape` option)

The ptex2tex tool makes it possible to easily switch between many different fancy formattings of computer or verbatim code in LaTeX documents. After any `!bc` command in the Doconce source you can insert verbatim block styles as defined in your .ptex2tex.cfg file, e.g., `!bc sys` for a terminal session, where `sys` is set to a certain environment in .ptex2tex.cfg (e.g., `CodeTerminal`). There are about 40 styles to choose from, and you can easily add new ones.

Also the doconce ptex2tex command supports preprocessor directives for processing the .p.tex file. The command allows specifications of code environments as well. Here is an example::

" **tutorial.txt** "

```
Terminal> doconce ptex2tex mydoc -DLATEX_HEADING=traditional \
-DPALATINO -DA6PAPER \
"sys=\begin{quote}\begin{verbatim}@end{verbatim}\end{quote}"
\
fpro=minted fcod=minted shcod=Verbatim enviro=ans:nt
```

Note that @ must be used to separate the begin and end LaTeX commands, unless only the environment name is given (such as minted above, which implies \begin{minted}{fortran} and \end{minted} as begin and end for blocks inside !bc fpro and !ec). Specifying enviro=ans:nt means that all other environments are typeset with the anslistings.sty package, e.g., !bc cppcod will then result in \begin{c++}. If no environments like sys, fpro, or the common enviro are defined on the command line, the plain \begin{verbatim} and \end{verbatim} used.

Step 2b (optional).

Edit the mydoc.tex file to your needs. For example, you may want to substitute section by section* to avoid numbering of sections, you may want to insert linebreaks (and perhaps space) in the title, etc. This can be automatically edited with the aid of the doconce replace and doconce subst commands. The former works with substituting text directly, while the latter performs substitutions using regular expressions. Here are two examples::

```
Terminal> doconce replace 'section{' 'section*{' mydoc.tex
Terminal> doconce subst 'title\{((+)\Using ((+)\)\}' \
'title\{<1> \\\ [1.5mm] Using \<2>' mydoc.tex
```

A lot of tailored fixes to the LaTeX document can be done by an appropriate set of text replacements and regular expression substitutions. You are anyway encouraged to make a script for generating PDF from the LaTeX file.

Step 3. Compile mydoc.tex and create the PDF file::

```
Terminal> latex mydoc
Terminal> latex mydoc
Terminal> makeindex mydoc      # if index
Terminal> bibitem mydoc       # if bibliography
Terminal> latex mydoc
Terminal> dvipdf mydoc
```

If one wishes to run ptex2tex and use the minted LaTeX package for typesetting code blocks (Minted_Python, Minted_Cpp, etc., in ptex2tex specified through the *pro and *cod variables in .ptex2tex.cfg or \$HOME/.ptex2tex.cfg), the minted LaTeX package is needed. This package is included by running ptex2tex with the -DMINTED option::

```
Terminal> ptex2tex -DMINTED mydoc
```

”

tutorial.txt

”

In this case, latex must be run with the
-shell-escape option::

```
Terminal> latex -shell-escape mydoc
Terminal> latex -shell-escape mydoc
Terminal> makeindex mydoc      # if index
Terminal> bibitem mydoc        # if bibliography
Terminal> latex -shell-escape mydoc
Terminal> dvipdf mydoc
```

When running doconce ptex2tex mydoc enviro=minted (or other minted specifications with doconce ptex2tex), the minted package is automatically included so there is no need for the -DMINTED option.

PDFLaTeX

Running pdflatex instead of latex follows almost the same steps,
but the start is::

```
Terminal> doconce format latex mydoc
```

Then ptex2tex is run as explained above, and finally::

```
Terminal> pdflatex -shell-escape mydoc
Terminal> makeindex mydoc      # if index
Terminal> bibitem mydoc        # if bibliography
Terminal> pdflatex -shell-escape mydoc
```

Plain ASCII Text

We can go from Doconce "back to" plain untagged text suitable for viewing
in terminal windows, inclusion in email text, or for insertion in
computer source code::

```
Terminal> doconce format plain mydoc.do.txt # results in mydoc.txt
```

reStructuredText

Going from Doconce to reStructuredText gives a lot of possibilities to
go to other formats. First we filter the Doconce text to a
reStructuredText file mydoc.rst::

```
Terminal> doconce format rst mydoc.do.txt
```

We may now produce various other formats::

```
Terminal> rst2html.py mydoc.rst > mydoc.html # html
```

”

”

”

tutorial.txt

```
Terminal> rst2latex.py mydoc.rst > mydoc.tex # latex
Terminal> rst2xml.py mydoc.rst > mydoc.xml # XML
Terminal> rst2odt.py mydoc.rst > mydoc.odt # OpenOffice
```

The OpenOffice file mydoc.odt can be loaded into OpenOffice and saved in, among other things, the RTF format or the Microsoft Word format. However, it is more convenient to use the program `unoconv` to convert between the many formats OpenOffice supports *on the command line*. Run::

```
Terminal> unoconv --show
```

to see all the formats that are supported. For example, the following commands take mydoc.odt to Microsoft Office Open XML format, classic MS Word format, and PDF::

```
Terminal> unoconv -f ooxml mydoc.odt
Terminal> unoconv -f doc mydoc.odt
Terminal> unoconv -f pdf mydoc.odt
```

Remark about Mathematical Typesetting. At the time of this writing, there is no easy way to go from Doconce and LaTeX mathematics to reST and further to OpenOffice and the "MS Word world". Mathematics is only fully supported by latex as output and to a wide extent also supported by the sphinx output format. Some links for going from LaTeX to Word are listed below.

- * <http://ubuntuforums.org/showthread.php?t=1033441>
- * <http://tug.org/utilities/texconv/textopc.html>
- * <http://nileshbansal.blogspot.com/2007/12/latex-to-openofficeword.html>

Sphinx

Sphinx documents demand quite some steps in their creation. We have automated most of the steps through the `doconce sphinx_dir` command::

```
Terminal> doconce sphinx_dir author="authors' names" \
          title="some title" version=1.0 dirname=sphinxdir \
          theme=mytheme file1 file2 file3 ...
```

The keywords `author`, `title`, and `version` are used in the headings of the Sphinx document. By default, `version` is 1.0 and the script will try to deduce authors and title from the doconce files `file1`, `file2`, etc. that together represent the whole document. Note that none of the individual Doconce files `file1`, `file2`, etc. should include the rest as their union makes up the whole document. The default value of `dirname` is `sphinx-rootdir`. The `theme` keyword is used to set the theme for design of HTML output from Sphinx (the default theme is 'default').

”

tutorial.txt

”

With a single-file document in mydoc.do.txt one often just runs::

```
Terminal> doconce sphinx_dir mydoc
```

and then an appropriate Sphinx directory sphinx-rootdir is made with relevant files.

The doconce sphinx_dir command generates a script automake_sphinx.py for compiling the Sphinx document into an HTML document. One can either run automake_sphinx.py or perform the steps in the script manually, possibly with necessary modifications. You should at least read the script prior to executing it to have some idea of what is done.

The doconce sphinx_dir script copies directories named figs or figures over to the Sphinx directory so that figures are accessible in the Sphinx compilation. If figures or movies are located in other directories, automake_sphinx.py must be edited accordingly. Files, to which there are local links (not http: or file: URLs), must be placed in the _static subdirectory of the Sphinx directory. The utility doconce sphinxfix_localURLs is run to check for local links in the Doconce file: for each such link, say dir1/dir2/myfile.txt it replaces the link by _static/myfile.txt and copies dir1/dir2/myfile.txt to a local _static directory (in the same directory as the script is run). However, we recommend instead that the writer of the document places files in _static or lets a script do it automatically. The user must copy all _static/* files to the _static subdirectory of the Sphinx directory. It may be wise to always put files, to which there are local links in the Doconce document, in a _static or _static-name directory and use these local links. Then links do not need to be modified when creating a Sphinx version of the document.

Doconce comes with a collection of HTML themes for Sphinx documents. These are packed out in the Sphinx directory, the conf.py configuration file for Sphinx is edited accordingly, and a script make-themes.sh can make HTML documents with one or more themes. For example, to realize the themes fenics and pyramid, one writes::

```
Terminal> ./make-themes.sh fenics pyramid
```

The resulting directories with HTML documents are _build/html_fenics and _build/html_pyramid, respectively. Without arguments, make-themes.sh makes all available themes (!).

If it is not desirable to use the autogenerated scripts explained above, here is the complete manual procedure of generating a Sphinx document from a file mydoc.do.txt.

Step 1. Translate Doconce into the Sphinx format::

```
Terminal> doconce format sphinx mydoc
```

Step 2. Create a Sphinx root directory

”

”

”

” **tutorial.txt** ”

either manually or by using the interactive sphinx-quickstart program. Here is a scripted version of the steps with the latter::

```
mkdir sphinx-rootdir
sphinx-quickstart <<EOF
sphinx-rootdir
n
-
Name of My Sphinx Document
Author
version
version
.rst
index
n
Y
n
n
n
n
Y
n
n
Y
Y
Y
EOF
```

The autogenerated conf.py file may need some edits if you want to specific layout (Sphinx themes) of HTML pages. The doconce sphinx_dir generator makes an extended conv.py file where, among other things, several useful Sphinx extensions are included.

Step 3. Copy the mydoc.rst file to the Sphinx root directory::

```
Terminal> cp mydoc.rst sphinx-rootdir
```

If you have figures in your document, the relative paths to those will be invalid when you work with mydoc.rst in the sphinx-rootdir directory. Either edit mydoc.rst so that figure file paths are correct, or simply copy your figure directories to sphinx-rootdir. Links to local files in mydoc.rst must be modified to links to files in the _static directory, see comment above.

Step 4. Edit the generated index.rst file so that mydoc.rst is included, i.e., add mydoc to the toctree section so that it becomes::

```
.. toctree::
   :maxdepth: 2

   mydoc
```

(The spaces before mydoc are important!)

” **tutorial.txt** ”

Step 5. Generate, for instance, an HTML version of the Sphinx source::

```
make clean    # remove old versions
make html
```

Sphinx can generate a range of different formats: standalone HTML, HTML in separate directories with index.html files, a large single HTML file, JSON files, various help files (the qthelp, HTML, and Devhelp projects), epub, LaTeX, PDF (via LaTeX), pure text, man pages, and Texinfo files.

Step 6. View the result::

```
Terminal> firefox _build/html/index.html
```

Note that verbatim code blocks can be typeset in a variety of ways depending the argument that follows !bc: cod gives Python (code-block:: python in Sphinx syntax) and cppcod gives C++, but all such arguments can be customized both for Sphinx and LaTeX output.

Wiki Formats

There are many different wiki formats, but Doconce only supports three: Googlecode wiki (<http://code.google.com/p/support/wiki/WikiSyntax>), MediaWiki (<http://www.mediawiki.org/wiki/Help:Formatting>), and Creole Wiki (<http://www.wikicreole.org/wiki/Creole1.0>). These formats are called gwiki, mwiki, and cwiki, respectively. Transformation from Doconce to these formats is done by::

```
Terminal> doconce format gwiki mydoc.do.txt
Terminal> doconce format mwiki mydoc.do.txt
Terminal> doconce format cwiki mydoc.do.txt
```

The produced MediaWiki can be tested in the sandbox of wikibooks.org (<http://en.wikibooks.org/wiki/Sandbox>). The format works well with Wikipedia, Wikibooks, and ShoutWiki (http://doconcedemo.shoutwiki.com/wiki/Doconce_demo_page), but not always well elsewhere (see this example (http://doconcedemo.jumpwiki.com/wiki/First_demo)).

Large MediaWiki documents can be made with the Book creator (http://en.wikipedia.org/w/index.php?title=Special:Book&bookcmd=book_creator).

From the MediaWiki format one can go to other formats with aid of mwlib (<http://pediapress.com/code/>). This means that one can easily use Doconce to write Wikibooks (<http://en.wikibooks.org>) and publish these in PDF and MediaWiki format, while at the same time, the book can also be published as a standard LaTeX book, a Sphinx web document, or a collection of HTML files.

tutorial.txt

The Googlecode wiki document, mydoc.gwiki, is most conveniently stored in a directory which is a clone of the wiki part of the Googlecode project. This is far easier than copying and pasting the entire text into the wiki editor in a web browser.

When the Doconce file contains figures, each figure filename must in the .gwiki file be replaced by a URL where the figure is available. There are instructions in the file for doing this. Usually, one performs this substitution automatically (see next section).

Tweaking the Doconce Output

Occasionally, one would like to tweak the output in a certain format from Doconce. One example is figure filenames when transforming Doconce to reStructuredText. Since Doconce does not know if the .rst file is going to be filtered to LaTeX or HTML, it cannot know if .eps or .png is the most appropriate image filename. The solution is to use a text substitution command or code with, e.g., sed, perl, python, or scitools subst, to automatically edit the output file from Doconce. It is then wise to run Doconce and the editing commands from a script to automate all steps in going from Doconce to the final format(s). The make.sh files in docs/manual and docs/tutorial constitute comprehensive examples on how such scripts can be made.

Demos

The current text is generated from a Doconce format stored in the file::

docs/tutorial/tutorial.do.txt

The file make.sh in the tutorial directory of the Doconce source code contains a demo of how to produce a variety of formats. The source of this tutorial, tutorial.do.txt is the starting point. Running make.sh and studying the various generated files and comparing them with the original tutorial.do.txt file, gives a quick introduction to how Doconce is used in a real case. Here (<https://doconce.googlecode.com/hg/doc/demos/tutorial/index.html>) is a sample of how this tutorial looks in different formats.

There is another demo in the docs/manual directory which translates the more comprehensive documentation, manual.do.txt, to various formats. The make.sh script runs a set of translations.

Installation of Doconce and its Dependencies

Doconce

Doconce itself is pure Python code hosted at <http://code.google.com/p/doconce>. Its installation from the Mercurial (hg) source follows the standard procedure::

” **tutorial.txt** ”

```
# Doconce
hg clone https://code.google.com/p/doconce/ doconce
cd doconce
sudo python setup.py install
cd ..
```

Since Doconce is frequently updated, it is recommended to use the above procedure and whenever a problem occurs, make sure to update to the most recent version::

```
cd doconce
hg pull
hg update
sudo python setup.py install
```

Debian GNU/Linux users can also run::

```
sudo apt-get install doconce
```

This installs the latest release and not the most updated and bugfixed version.

On Ubuntu one needs to run::

```
sudo add-apt-repository ppa:scitools/ppa
sudo apt-get update
sudo apt-get install doconce
```

Dependencies

Preprocessors

~~~~~

If you make use of the Preprocess (<http://code.google.com/p/preprocess>) preprocessor, this program must be installed::

```
svn checkout http://preprocess.googlecode.com/svn/trunk/ preprocess
cd preprocess
cd doconce
sudo python setup.py install
cd ..
```

A much more advanced alternative to Preprocess is Mako (<http://www.makotemplates.org>). Its installation is most conveniently done by pip::

```
pip install Mako
```

This command requires pip to be installed. On Debian Linux systems, such as Ubuntu, the installation is simply done by::

” **tutorial.txt** ”

```
sudo apt-get install python-pip
```

Alternatively, one can install from the pip source code (<http://pypi.python.org/pypi/pip>).

Mako can also be installed directly from source (<http://www.makotemplates.org/download.html>): download the tarball, pack it out, go to the directory and run the usual `sudo python setup.py install`.

Image file handling

~~~~~

Different output formats require different formats of image files. For example, PostScript or Encapsulated PostScript is required for latex output, while HTML needs JPEG, GIF, or PNG formats. Doconce calls up programs from the ImageMagick suite for converting image files to a proper format if needed. The ImageMagick suite (<http://www.imagemagick.org/script/index.php>) can be installed on all major platforms. On Debian Linux (including Ubuntu) systems one can simply write::

```
sudo apt-get install imagemagick
```

The convenience program `doconce combine_images`, for combining several images into one, will use `montage` and convert from ImageMagick and the `pdftk`, `pdfnup`, and `pdfcrop` programs from the `texlive-extra-utils` Debian package. The latter gets installed by::

```
sudo apt-get install texlive-extra-utils
```

Spellcheck

~~~~~

The utility `doconce spellcheck` applies the `ispell` program for spellcheck. On Debian (including Ubuntu) it is installed by::

```
sudo apt-get install ispell
```

Ptex2tex for LaTeX Output

~~~~~

To make LaTeX documents with very flexible choice of typesetting of verbatim code blocks you need `ptex2tex` (<http://code.google.com/p/ptex2tex>), which is installed by::

```
svn checkout http://ptex2tex.googlecode.com/svn/trunk/ ptex2tex
cd ptex2tex
sudo python setup.py install
```

It may happen that you need additional style files, you can run

” **tutorial.txt** ”

a script, cp2texmf.sh::

```
cd latex
sh cp2texmf.sh # copy stylefiles to ~/texmf directory
cd ../../
```

This script copies some special stylefiles that that ptex2tex potentially makes use of. Some more standard stylefiles are also needed. These are installed by::

```
sudo apt-get install texlive-latex-recommended texlive-latex-extra
```

on Debian Linux (including Ubuntu) systems. TeXShop on Mac comes with the necessary stylefiles (if not, they can be found by googling and installed manually in the ~/texmf/tex/latex/misc directory).

Note that the doconce ptex2tex command, which needs no installation beyond Doconce itself, can be used as a simpler alternative to the ptex2tex program.

The **minted** LaTeX style is offered by ptex2tex and doconce ptext2tex and popular among many users. This style requires the package Pygments (<http://pygments.org>) to be installed. On Debian Linux::

```
sudo apt-get install python-pygments
```

Alternatively, the package can be installed manually::

```
hg clone ssh://hg@bitbucket.org/birkenfeld/pygments-main pygments
cd pygments
sudo python setup.py install
```

If you use the minted style together with ptex2tex, you have to enable it by the -DMINTED command-line argument to ptex2tex. This is not necessary if you run the alternative doconce ptex2tex program.

All use of the minted style requires the -shell-escape command-line argument when running LaTeX, i.e., latex -shell-escape or pdflatex -shell-escape.

reStructuredText (reST) Output

~~~~~

The rst output from Doconce allows further transformation to LaTeX, HTML, XML, OpenOffice, and so on, through the docutils (<http://docutils.sourceforge.net>) package. The installation of the most recent version can be done by::

```
svn checkout http://docutils.svn.sourceforge.net/svnroot/docutils/trunk/docutils
```

” **tutorial.txt** ”

```
cd docutils
sudo python setup.py install
cd ..
```

To use the OpenOffice suite you will typically on Debian systems install::

```
sudo apt-get install unovonv libreoffice libreoffice-dmaths
```

There is a possibility to create PDF files from reST documents using ReportLab instead of LaTeX. The enabling software is rst2pdf (<http://code.google.com/p/rst2pdf/>). Either download the tarball or clone the svn repository, go to the rst2pdf directory and run the usual `sudo python setup.py install`.

Output to sphinx requires of course the Sphinx software (<http://sphinx.pocoo.org/>), installed by::

```
hg clone https://bitbucket.org/birkenfeld/sphinx
cd sphinx
sudo python setup.py install
cd ..
```

#### Markdown and Pandoc Output

~~~~~

The Doconce format pandoc outputs the document in the Pandoc extended Markdown format, which via the pandoc program can be translated to a range of other formats. Installation of Pandoc (<http://johnmacfarlane.net/pandoc/>), written in Haskell, is most easily done by::

```
sudo apt-get install pandoc
```

on Debian (Ubuntu) systems.

Epydoc Output

~~~~~

When the output format is epydoc one needs that program too, installed by::

```
svn co https://epydock.svn.sourceforge.net/svnroot/epydock/trunk/epydock epydoc
cd epydoc
sudo make install
cd ..
```

*\*Remark.\** Several of the packages above installed from source code are also available in Debian-based system through the `apt-get install` command. However, we recommend installation directly

”

**tutorial.txt**

”

from the version control system repository as there might be important updates and bug fixes. For svn directories, go to the directory, run `svn update`, and then `sudo python setup.py install`. For Mercurial (hg) directories, go to the directory, run `hg pull`; `hg update`, and then `sudo python setup.py install`.

## tutorial.epytext

TITLE: Doconce: Document Once, Include Anywhere

BY: Hans Petter Langtangen (Simula Research Laboratory, and University of Oslo)

ATE: today

- When writing a note, report, manual, etc., do you find it difficult to choose the typesetting format? That is, to choose between plain (email-like) text, wiki, Word/OpenOffice, LaTeX, HTML, reStructuredText, Sphinx, XML, etc. Would it be convenient to start with some very simple text-like format that easily converts to the formats listed above, and then at some later stage eventually go with a particular format?
- Do you need to write documents in varying formats but find it difficult to remember all the typesetting details of various formats like U{LaTeX<<http://refcards.com/docs/silvermanj/amslatex/LaTeXRefCard.v2.0.pdf>>}, U{HTML<<http://www.htmlcodetutorial.com/>>}, U{reStructuredText<<http://docutils.sourceforge.net/docs/ref/rst/restructuredtext.html>>}, U{Sphinx<<http://sphinx.pocoo.org/contents.html>>}, and U{wiki<<http://code.google.com/p/support/wiki/WikiSyntax>>}? Would it be convenient to generate the typesetting details of a particular format from a very simple text-like format with minimal tagging?
- Do you have the same information scattered around in different documents in different typesetting formats? Would it be a good idea to write things once, in one format, stored in one place, and include it anywhere?

If any of these questions are of interest, you should keep on reading.

What Does Doconce Look Like?

=====

Doconce text looks like ordinary text, but there are some almost invisible text constructions that allow you to control the formatting. Here are some examples.

- Bullet lists arise from lines starting with C{\*}.
- I{Emphasized words} are surrounded by C{\*}.
- B{Words in boldface} are surrounded by underscores.
- Words from computer code are enclosed in back quotes and then typeset C{verbatim (in a monospace font)}.
- Section headings are recognized by equality (C{=}) signs before and after the title, and the number of C{=} signs indicates the level of the section: 7 for main section, 5 for subsection, and 3 for subsubsection.
- Paragraph headings are recognized by a double underscore before and after the heading.
- The abstract of a document starts with I{Abstract} as paragraph heading, and all text up to the next heading makes up the abstract.
- Blocks of computer code can easily be included by placing C{!bc} (begin code) and C{!ec} (end code) commands at separate lines before and after the code block.
- Blocks of computer code can also be imported from source files.
- Blocks of LaTeX mathematics can easily be included by placing C{!bt} (begin TeX) and C{!et} (end TeX) commands at separate lines before and after the math block.
- There is support for both LaTeX and text-like inline mathematics.
- Figures and movies with captions, simple tables,



## tutorial.epytext

- URLs with links, index list, labels and references are supported.
- Invisible comments in the output format can be inserted throughout the text.
  - Visible comments can be inserted so that authors and readers can comment upon the text (and at any time turn on/off output of such comments).
  - There is an exercise environment with many advanced features.
  - With a preprocessor, Preprocess or Mako, one can include other documents (files) and large portions of text can be defined in or out of the text.
  - With Mako one can also have Python code embedded in the Doconce document and thereby parameterize the text (e.g., one text can describe programming in two languages).

Here is an example of some simple text written in the Doconce format::

```
===== A Subsection with Sample Text =====
label{my:first:sec}
```

Ordinary text looks like ordinary text, and the tags used for boldface words, *\*emphasized\** words, and `'computer'` words look natural in plain text. Lists are typeset as you would do in email,

- \* item 1
- \* item 2
- \* item 3

Lists can also have automatically numbered items instead of bullets,

- o item 1
- o item 2
- o item 3

URLs with a link word are possible, as in "hpl": "http://folk.uio.no/hpl

If the word is URL, the URL itself becomes the link name, as in "URL": "tutorial.do.txt".

References to sections may use logical names as labels (e.g., a "label" command right after the section title), as in the reference to Section ref{my:first:sec}.

Doconce also allows inline comments of the form [name: comment] (with a space after 'name:'), e.g., such as [hpl: here I will make some remarks to the text]. Inline comments can be removed from the output by a command-line argument (see Section ref{doconce2formats} for an example).

Tables are also supported, e.g.,

| time | velocity | acceleration |
|------|----------|--------------|
| 0.0  | 1.4186   | -5.01        |
| 2.0  | 1.376512 | 11.919       |
| 4.0  | 1.1E+1   | 14.717624    |

## tutorial.epytext

# lines beginning with # are comment lines

The Doconce text above results in the following little document:

### A Subsection with Sample Text

Ordinary text looks like ordinary text, and the tags used for `B{boldface}` words, `I{emphasized}` words, and `C{computer}` words look natural in plain text. Lists are typeset as you would do in an email,

- item 1
- item 2
- item 3

Lists can also have numbered items instead of bullets, just use an `C{o}` (for ordered) instead of the asterisk:

1. item 1
2. item 2
3. item 3

URLs with a link word are possible, as in `U{hpl<http://folk.uio.no/hpl>}`. If the word is URL, the URL itself becomes the link name, as in `U{tutorial.do.txt<tutorial.do.txt>}`.

References to sections may use logical names as labels (e.g., a "label" command right after the section title), as in the reference to the section "A Subsection with Sample Text".

Doconce also allows inline comments such as `[hpl: here I will make some remarks to the text]` for allowing authors to make notes. Inline comments can be removed from the output by a command-line argument (see the section "From Doconce to Other Formats" for an example).

Tables are also supported, e.g.,

| time | velocity | acceleration |
|------|----------|--------------|
| 0.0  | 1.4186   | -5.01        |
| 2.0  | 1.376512 | 11.919       |
| 4.0  | 1.1E+1   | 14.717624    |

### Mathematics and Computer Code

Inline mathematics, such as `M{v = sin(x)}`, allows the formula to be specified both as LaTeX and as plain text. This results in a professional LaTeX typesetting, but in other formats the text version normally looks better than raw LaTeX mathematics with backslashes. An inline formula like `M{v = sin(x)}` is typeset as::

NOTE: A verbatim block has been removed because it causes problems for Epytext.

” **tutorial.epytext** ”

The pipe symbol acts as a delimiter between LaTeX code and the plain text version of the formula. If you write a lot of mathematics, only the output formats `C{latex}`, `C{pdflatex}`, `C{html}`, `C{sphinx}`, and `C{pandoc}` are of interest and all these support inline LaTeX mathematics so then you will naturally drop the pipe symbol and write just::

NOTE: A verbatim block has been removed because it causes problems for Epytext.

However, if you want more textual formats, like plain text or `reStructuredText`, the text after the pipe symbol may help to make the math formula more readable if there are backslashes or other special LaTeX symbols in the LaTeX code.

Blocks of mathematics are typeset with raw LaTeX, inside `C{!bt}` and `C{!et}` (begin TeX, end TeX) instructions::

NOTE: A verbatim block has been removed because it causes problems for Epytext.

The result looks like this::

NOTE: A verbatim block has been removed because it causes problems for Epytext.

Of course, such blocks only looks nice in formats with support for LaTeX mathematics, and here the `align` environment in particular (this includes `C{latex}`, `C{pdflatex}`, `C{html}`, and `C{sphinx}`). The raw LaTeX syntax appears in simpler formats, but can still be useful for those who can read LaTeX syntax.

You can have blocks of computer code, starting and ending with `C{!bc}` and `C{!ec}` instructions, respectively::

```
!bc pycod
from math import sin, pi
def myfunc(x):
    return sin(pi*x)

import integrate
I = integrate.trapezoidal(myfunc, 0, pi, 100)
!ec
```

Such blocks are formatted as::

```
from math import sin, pi
def myfunc(x):
```

” **tutorial.epytext** ”

```

    return sin(pi*x)

import integrate
I = integrate.trapezoidal(myfunc, 0, pi, 100)

```

A code block must come after some plain sentence (at least for successful output to C{sphinx}, C{rst}, and ASCII-close formats), not directly after a section/paragraph heading or a table.

One can also copy computer code directly from files, either the complete file or specified parts. Computer code is then never duplicated in the documentation (important for the principle of avoiding copying information!).

Another document can be included by writing C{# #include "mynote.do.txt"} at the beginning of a line. Doconce documents have extension C{do.txt}. The C{do} part stands for doconce, while the trailing C{.txt} denotes a text document so that editors gives you plain text editing capabilities.

#### Macros (Newcommands), Cross-References, Index, and Bibliography

-----

Doconce supports a type of macros via a LaTeX-style I{newcommand} construction. The newcommands defined in a file with name C{newcommand\_replace.tex} are expanded when Doconce is filtered to other formats, except for LaTeX (since LaTeX performs the expansion itself). Newcommands in files with names C{newcommands.tex} and C{newcommands\_keep.tex} are kept unaltered when Doconce text is filtered to other formats, except for the Sphinx format. Since Sphinx understands LaTeX math, but not newcommands if the Sphinx output is HTML, it makes most sense to expand all newcommands. Normally, a user will put all newcommands that appear in math blocks surrounded by C{!bt} and C{!et} in C{newcommands\_keep.tex} to keep them unchanged, at least if they contribute to make the raw LaTeX math text easier to read in the formats that cannot render LaTeX. Newcommands used elsewhere throughout the text will usually be placed in C{newcommands\_replace.tex} and expanded by Doconce. The definitions of newcommands in the C{newcommands\*.tex} files I{must} appear on a single line (multi-line newcommands are too hard to parse with regular expressions).

Recent versions of Doconce also offer cross referencing, typically one can define labels below (sub)sections, in figure captions, or in equations, and then refer to these later. Entries in an index can be defined and result in an index at the end for the LaTeX and Sphinx formats. Citations to literature, with an accompanying bibliography in a file, are also supported. The syntax of labels, references, citations, and the bibliography closely resembles that of LaTeX, making it easy for Doconce documents to be integrated in LaTeX projects (manuals, books). For further details on functionality and syntax we refer to the C{doc/manual/manual.do.txt} file (see the U{demo page<<https://doconce.googlecode.com/hg/doc/demos/manual/index.html>>} for various formats of this document).

” **tutorial.epytext** ”

## From Doconce to Other Formats

=====

Transformation of a Doconce document C{mydoc.do.txt} to various other formats applies the script C{doconce format}::

```
Terminal> doconce format format mydoc.do.txt
```

or just::

```
Terminal> doconce format format mydoc
```

## Preprocessing

-----

The C{preprocess} and C{mako} programs are used to preprocess the file, and options to C{preprocess} and/or C{mako} can be added after the filename. For example::

```
Terminal> doconce format latex mydoc -Dextra_sections -DVAR1=5      # pre
process
Terminal> doconce format latex yourdoc extra_sections=True VAR1=5  # mak
o
```

The variable C{FORMAT} is always defined as the current format when running C{preprocess} or C{mako}. That is, in the last example, C{FORMAT} is defined as C{latex}. Inside the Doconce document one can then perform format specific actions through tests like C{#if FORMAT == "latex"} (for C{preprocess}) or C{% if FORMAT == "latex":} (for C{mako}).

## Removal of inline comments

-----

The command-line arguments C{--no-preprocess} and C{--no-mako} turn off running C{preprocess} and C{mako}, respectively.

Inline comments in the text are removed from the output by::

```
Terminal> doconce format latex mydoc --skip_inline_comments
```

One can also remove all such comments from the original Doconce file by running::

```
Terminal> doconce remove_inline_comments mydoc
```

This action is convenient when a Doconce document reaches its final form and comments by different authors should be removed.

## HTML

----

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Making an HTML version of a Doconce file `C{mydoc.do.txt}` is performed by::

```
Terminal> doconce format html mydoc
```

The resulting file `C{mydoc.html}` can be loaded into any web browser for viewing.

The HTML style can be defined either in the header of the HTML file or in an external CSS file. The latter is enabled by the command-line argument `C{--css=filename}`. There is a default style with blue headings, and a style with the U{solarized<<http://ethanschoonover.com/solarized>>} color palette, specified by the `C{--html-solarized}` command line argument. If there is no file with name `C{filename}` in the `C{--css=filename}` specification, the blue or solarized styles are written to `C{filename}` and linked from the HTML document. You can provide your own style sheet either by replacing the content inside the `C{style}` tags or by specifying a CSS file through the `C{--css=filename}` option.

If the Pygments package (including the `C{pygmentize}` program) is installed, code blocks are typeset with aid of this package. The command-line argument `C{--no-pygments-html}` turns off the use of Pygments and makes code blocks appear with plain (`C{pre}`) HTML tags. The option `C{--pygments-html-linenos}` turns on line numbers in Pygments-formatted code blocks.

The HTML file can be embedded in a template if the Doconce document does not have a title (because then there will be no header and footer in the HTML file). The template file must contain valid HTML code and can have three "slots": `C{%(title)s}` for a title, `C{%(date)s}` for a date, and `C{%(main)s}` for the main body of text, i.e., the Doconce document translated to HTML. The title becomes the first heading in the Doconce document, and the date is extracted from the `C{DATE:}` line, if present. With the template feature one can easily embed the text in the look and feel of a website. The template can be extracted from the source code of a page at the site; just insert `C{%(title)s}` and `C{%(date)s}` at appropriate places and replace the main bod of text by `C{%(main)s}`. Here is an example::

```
Terminal> doconce format html mydoc --html-template=mytemplate.html
```

Blogs  
-----

Doconce can be used for writing blogs provided the blog site accepts raw HTML code. Google's Blogger service (`C{blogname.blogspot.com}`) is particularly well suited since it also allows extensive LaTeX mathematics via MathJax.

Write the blog text as a Doconce document without any title, author, and date. Then generate HTML as described above. Copy the text and paste it into the text area in the blog, making sure the input format is HTML. On Google's Blogger service you can use Doconce to generate blogs with LaTeX mathematics and pretty (pygmentized) blocks of computer code. See a U{blog example<<http://doconce.blogspot.no>>} for details on blogging.

” **tutorial.epytext** ”

I{Warning.} In the comments after the blog one cannot paste raw HTML code with MathJax scripts so there is no support for mathematics in the comments.

WordPress (C{wordpress.com}) allows raw HTML code in blogs, but has very limited LaTeX support, basically only formulas. The C{--wordpress} option to C{doconce} modifies the HTML code such that all equations are typeset in a way that is acceptable to WordPress. There is a U{doconce example<<http://doconce.wordpress.com>>} on blogging with mathematics and code on WordPress.

### Pandoc and Markdown

-----

Output in Pandoc's extended Markdown format results from::

```
Terminal> doconce format pandoc mydoc
```

The name of the output file is C{mydoc.mkd}.  
From this format one can go to numerous other formats::

```
Terminal> pandoc -R -t mediawiki -o mydoc.mwk --toc mydoc.mkd
```

Pandoc supports C{latex}, C{html}, C{odt} (OpenOffice), C{docx} (Microsoft Word), C{rtf}, C{texinfo}, to mention some. The C{-R} option makes Pandoc pass raw HTML or LaTeX to the output format instead of ignoring it, while the C{--toc} option generates a table of contents. See the U{Pandoc documentation<<http://johnmacfarlane.net/pandoc/README.html>>} for the many features of the C{pandoc} program.

Pandoc is useful to go from LaTeX mathematics to, e.g., HTML or MS Word. There are two ways (experiment to find the best one for your document): C{doconce format pandoc} and then translating using C{pandoc}, or C{doconce format latex}, and then going from LaTeX to the desired format using C{pandoc}. Here is an example on the latter strategy::

```
Terminal> doconce format latex mydoc
Terminal> doconce ptex2tex mydoc
Terminal> doconce replace '\Verb!' '\verb!' mydoc.tex
Terminal> pandoc -f latex -t docx -o mydoc.docx mydoc.tex
```

When we go through C{pandoc}, only single equations or C{align\*} environments are well understood.

Note that Doconce applies the C{Verb} macro from the C{fancyvrb} package while C{pandoc} only supports the standard C{verb} construction for inline verbatim text. Moreover, quite some additional C{doconce replace} and C{doconce subst} edits might be needed on the C{.mkd} or C{.tex} files to successfully have mathematics that is well translated to MS Word. Also when going to reStructuredText using Pandoc, it can be advantageous to go via LaTeX.

Here is an example where we take a Doconce snippet (without title, author,

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and date), maybe with some unnumbered equations, and quickly generate HTML with mathematics displayed my MathJax::

```
Terminal> doconce format pandoc mydoc
Terminal> pandoc -t html -o mydoc.html -s --mathjax mydoc.mkd
```

The C{-s} option adds a proper header and footer to the C{mydoc.html} file. This recipe is a quick way of making HTML notes with (some) mathematics.

LaTeX

-----

Making a LaTeX file C{mydoc.tex} from C{mydoc.do.txt} is done in two steps:

I{Step 1.} Filter the doconce text to a pre-LaTeX form C{mydoc.p.tex} for the C{ptex2tex} program (or C{doconce ptex2tex})::

```
Terminal> doconce format latex mydoc
```

LaTeX-specific commands ("newcommands") in math formulas and similar can be placed in files C{newcommands.tex}, C{newcommands\_keep.tex}, or C{newcommands\_replace.tex} (see the section "Macros (Newcommands), Cross-References, Index, and Bibliography").

If these files are present, they are included in the LaTeX document so that your commands are defined.

An option C{--latex-printed} makes some adjustments for documents aimed at being printed. For example, links to web resources are associated with a footnote listing the complete web address (URL).

I{Step 2.} Run C{ptex2tex} (if you have it) to make a standard LaTeX file::

```
Terminal> ptex2tex mydoc
```

In case you do not have C{ptex2tex}, you may run a (very) simplified version::

```
Terminal> doconce ptex2tex mydoc
```

Note that Doconce generates a C{.p.tex} file with some preprocessor macros that can be used to steer certain properties of the LaTeX document. For example, to turn on the Helvetica font instead of the standard Computer Modern font, run::

```
Terminal> ptex2tex -DHELVETICA mydoc
Terminal> doconce ptex2tex mydoc -DHELVETICA # alternative
```

The title, authors, and date are by default typeset in a non-standard way to enable a nicer treatment of multiple authors having institutions in common. However, the standard LaTeX "maketitle" heading is also available through C{-DLATEX\_HEADING=traditional}. A separate titlepage can be generated by C{-DLATEX\_HEADING=titlepage}.



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Preprocessor variables to be defined or undefined are

- C{BOOK} for the "book" documentclass rather than the standard "article" class (necessary if you apply chapter headings)
- C{PALATINO} for the Palatino font
- C{HELVETIA} for the Helvetica font
- C{A4PAPER} for A4 paper size
- C{A6PAPER} for A6 paper size (suitable for reading on small devices)
- C{MOVIE15} for using the movie15 LaTeX package to display movies
- C{PREAMBLE} to turn the LaTeX preamble on or off (i.e., complete document or document to be included elsewhere)
- C{MINTED} for inclusion of the minted package (which requires C{latex} or C{pdflatex} to be run with the C{-shell-escape} option)

The C{ptex2tex} tool makes it possible to easily switch between many different fancy formattings of computer or verbatim code in LaTeX documents. After any C{!bc} command in the Doconce source you can insert verbatim block styles as defined in your C{.ptex2tex.cfg} file, e.g., C{!bc sys} for a terminal session, where C{sys} is set to a certain environment in C{.ptex2tex.cfg} (e.g., C{CodeTerminal}). There are about 40 styles to choose from, and you can easily add new ones.

Also the C{doconce ptex2tex} command supports preprocessor directives for processing the C{.p.tex} file. The command allows specifications of code environments as well. Here is an example::

```
Terminal> doconce ptex2tex mydoc -DLATEX_HEADING=traditional \
-DPALATINO -DA6PAPER \
"sys=\begin{quote}\begin{verbatim}@\\end{verbatim}\\end{quote}"
\
fpro=minted fcod=minted shcod=Verbatim envir=ans:nt
```

Note that C{@} must be used to separate the begin and end LaTeX commands, unless only the environment name is given (such as C{minted} above, which implies C{\begin{minted}{fortran}} and C{\end{minted}} as begin and end for blocks inside C{!bc fpro} and C{!ec}). Specifying C{envir=ans:nt} means that all other environments are typeset with the C{anslistings.sty} package, e.g., C{!bc cppcod} will then result in C{\begin{c++}}. If no environments like C{sys}, C{fpro}, or the common C{envir} are defined on the command line, the plain C{\begin{verbatim}} and C{\end{verbatim}} used.

I{Step 2b (optional).} Edit the C{mydoc.tex} file to your needs. For example, you may want to substitute C{section} by C{section\*} to avoid numbering of sections, you may want to insert linebreaks (and perhaps space) in the title, etc. This can be automatically edited with the aid of the C{doconce replace} and C{doconce subst} commands. The former works with substituting text directly, while the latter performs substitutions using regular expressions. Here are two examples::

```
Terminal> doconce replace 'section{' 'section*' mydoc.tex
Terminal> doconce subst 'title\{((.+))Using (.+)\}' \
'title{\g<1> \\\ [1.5mm] Using \g<2>}' mydoc.tex
```

## tutorial.epytext

A lot of tailored fixes to the LaTeX document can be done by an appropriate set of text replacements and regular expression substitutions. You are anyway encouraged to make a script for generating PDF from the LaTeX file.

I{Step 3.} Compile C{mydoc.tex}  
and create the PDF file::

```
Terminal> latex mydoc
Terminal> latex mydoc
Terminal> makeindex mydoc      # if index
Terminal> bibitem mydoc       # if bibliography
Terminal> latex mydoc
Terminal> dvipdf mydoc
```

If one wishes to run C{ptex2tex} and use the minted LaTeX package for typesetting code blocks (C{Minted\_Python}, C{Minted\_Cpp}, etc., in C{ptex2tex} specified through the C{\*pro} and C{\*cod} variables in C{.ptex2tex.cfg} or C{\$HOME/.ptex2tex.cfg}), the minted LaTeX package is needed. This package is included by running C{ptex2tex} with the C{-DMINTED} option::

```
Terminal> ptex2tex -DMINTED mydoc
```

In this case, C{latex} must be run with the C{-shell-escape} option::

```
Terminal> latex -shell-escape mydoc
Terminal> latex -shell-escape mydoc
Terminal> makeindex mydoc      # if index
Terminal> bibitem mydoc       # if bibliography
Terminal> latex -shell-escape mydoc
Terminal> dvipdf mydoc
```

When running C{doconce ptex2tex mydoc envir=minted} (or other minted specifications with C{doconce ptex2tex}), the minted package is automatically included so there is no need for the C{-DMINTED} option.

### PDFLaTeX

Running C{pdflatex} instead of C{latex} follows almost the same steps, but the start is::

```
Terminal> doconce format latex mydoc
```

Then C{ptex2tex} is run as explained above, and finally::

```
Terminal> pdflatex -shell-escape mydoc
Terminal> makeindex mydoc      # if index
Terminal> bibitem mydoc       # if bibliography
```

” **tutorial.epytext** ”

```
Terminal> pdflatex -shell-escape mydoc
```

Plain ASCII Text

-----

We can go from Doconce "back to" plain untagged text suitable for viewing in terminal windows, inclusion in email text, or for insertion in computer source code::

```
Terminal> doconce format plain mydoc.do.txt # results in mydoc.txt
```

reStructuredText

-----

Going from Doconce to reStructuredText gives a lot of possibilities to go to other formats. First we filter the Doconce text to a reStructuredText file C{mydoc.rst}::

```
Terminal> doconce format rst mydoc.do.txt
```

We may now produce various other formats::

```
Terminal> rst2html.py mydoc.rst > mydoc.html # html
Terminal> rst2latex.py mydoc.rst > mydoc.tex # latex
Terminal> rst2xml.py mydoc.rst > mydoc.xml # XML
Terminal> rst2odt.py mydoc.rst > mydoc.odt # OpenOffice
```

The OpenOffice file C{mydoc.odt} can be loaded into OpenOffice and saved in, among other things, the RTF format or the Microsoft Word format. However, it is more convenient to use the program C{unovonv} to convert between the many formats OpenOffice supports I{on the command line}. Run::

```
Terminal> unoconv --show
```

to see all the formats that are supported. For example, the following commands take C{mydoc.odt} to Microsoft Office Open XML format, classic MS Word format, and PDF::

```
Terminal> unoconv -f ooxml mydoc.odt
Terminal> unoconv -f doc mydoc.odt
Terminal> unoconv -f pdf mydoc.odt
```

I{Remark about Mathematical Typesetting.} At the time of this writing, there is no easy way to go from Doconce and LaTeX mathematics to reST and further to OpenOffice and the "MS Word world". Mathematics is only fully supported by C{latex} as output and to a wide extent also supported by the C{sphinx} output format. Some links for going from LaTeX to Word are listed below.

" **tutorial.epytext** "

```
- U{http://ubuntuforums.org/showthread.php?t=1033441<http://ubuntuforums.org/showthread.php?t=1033441>}
- U{http://tug.org/utilities/texconv/textopc.html<http://tug.org/utilities/texconv/textopc.html>}
- U{http://nileshbansal.blogspot.com/2007/12/latex-to-openofficeword.html<http://nileshbansal.blogspot.com/2007/12/latex-to-openofficeword.html>}
```

Sphinx

-----

Sphinx documents demand quite some steps in their creation. We have automated most of the steps through the `C{doconce sphinx_dir}` command::

```
Terminal> doconce sphinx_dir author="authors' names" \
          title="some title" version=1.0 dirname=sphinx_dir \
          theme=mytheme file1 file2 file3 ...
```

The keywords `C{author}`, `C{title}`, and `C{version}` are used in the headings of the Sphinx document. By default, `C{version}` is 1.0 and the script will try to deduce authors and title from the doconce files `C{file1}`, `C{file2}`, etc. that together represent the whole document. Note that none of the individual Doconce files `C{file1}`, `C{file2}`, etc. should include the rest as their union makes up the whole document. The default value of `C{dirname}` is `C{sphinx-rootdir}`. The `C{theme}` keyword is used to set the theme for design of HTML output from Sphinx (the default theme is `C{'default'}`).

With a single-file document in `C{mydoc.do.txt}` one often just runs::

```
Terminal> doconce sphinx_dir mydoc
```

and then an appropriate Sphinx directory `C{sphinx-rootdir}` is made with relevant files.

The `C{doconce sphinx_dir}` command generates a script `C{automake_sphinx.py}` for compiling the Sphinx document into an HTML document. One can either run `C{automake_sphinx.py}` or perform the steps in the script manually, possibly with necessary modifications. You should at least read the script prior to executing it to have some idea of what is done.

The `C{doconce sphinx_dir}` script copies directories named `C{figs}` or `C{figures}` over to the Sphinx directory so that figures are accessible in the Sphinx compilation. If figures or movies are located in other directories, `C{automake_sphinx.py}` must be edited accordingly. Files, to which there are local links (not `C{http:}` or `C{file:}` URLs), must be placed in the `C{_static}` subdirectory of the Sphinx directory. The utility `C{doconce sphinxfix_localURLs}` is run to check for local links in the Doconce file: for each such link, say `C{dir1/dir2/myfile.txt}` it replaces the link by `C{_static/myfile.txt}` and copies `C{dir1/dir2/myfile.txt}` to a local `C{_static}` directory (in the same directory as the script is run). However, we recommend instead that the writer of the document places files in `C{_static}` or lets a script do it automatically. The user must copy all `C{_static/*}` files to the `C{_static}` subdirectory of the Sphinx directory. It may be wise to always put files, to which there are local links in the Doconce

” **tutorial.epytext** ”

document, in a C{static} or C{static-name} directory and use these local links. Then links do not need to be modified when creating a Sphinx version of the document.

Doconce comes with a collection of HTML themes for Sphinx documents. These are packed out in the Sphinx directory, the C{conf.py} configuration file for Sphinx is edited accordingly, and a script C{make-themes.sh} can make HTML documents with one or more themes. For example, to realize the themes C{fenics} and C{pyramid}, one writes::

```
Terminal> ./make-themes.sh fenics pyramid
```

The resulting directories with HTML documents are C{\_build/html\_fenics} and C{\_build/html\_pyramid}, respectively. Without arguments, C{make-themes.sh} makes all available themes (!).

If it is not desirable to use the autogenerated scripts explained above, here is the complete manual procedure of generating a Sphinx document from a file C{mydoc.do.txt}.

I{Step 1.} Translate Doconce into the Sphinx format::

```
Terminal> doconce format sphinx mydoc
```

I{Step 2.} Create a Sphinx root directory either manually or by using the interactive C{sphinx-quickstart} program. Here is a scripted version of the steps with the latter::

```
mkdir sphinx-rootdir
sphinx-quickstart <<EOF
sphinx-rootdir
n
-
Name of My Sphinx Document
Author
version
version
.rst
index
n
Y
n
n
n
n
Y
n
n
Y
Y
Y
EOF
```

The autogenerated C{conf.py} file

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may need some edits if you want to specific layout (Sphinx themes) of HTML pages. The `C{doconce sphinx_dir}` generator makes an extended `C{conv.py}` file where, among other things, several useful Sphinx extensions are included.

I{Step 3.} Copy the `C{mydoc.rst}` file to the Sphinx root directory::

```
Terminal> cp mydoc.rst sphinx-rootdir
```

If you have figures in your document, the relative paths to those will be invalid when you work with `C{mydoc.rst}` in the `C{sphinx-rootdir}` directory. Either edit `C{mydoc.rst}` so that figure file paths are correct, or simply copy your figure directories to `C{sphinx-rootdir}`. Links to local files in `C{mydoc.rst}` must be modified to links to files in the `C{_static}` directory, see comment above.

I{Step 4.} Edit the generated `C{index.rst}` file so that `C{mydoc.rst}` is included, i.e., add `C{mydoc}` to the `C{toctree}` section so that it becomes::

```
.. toctree::
    :maxdepth: 2

    mydoc
```

(The spaces before `C{mydoc}` are important!)

I{Step 5.} Generate, for instance, an HTML version of the Sphinx source::

```
make clean    # remove old versions
make html
```

Sphinx can generate a range of different formats: standalone HTML, HTML in separate directories with `C{index.html}` files, a large single HTML file, JSON files, various help files (the `qthelp`, HTML, and `Devhelp` projects), epub, LaTeX, PDF (via LaTeX), pure text, man pages, and Texinfo files.

I{Step 6.} View the result::

```
Terminal> firefox _build/html/index.html
```

Note that verbatim code blocks can be typeset in a variety of ways depending the argument that follows `C{!bc}`: `C{cod}` gives Python (`C{code-block:: python}` in Sphinx syntax) and `C{cppcod}` gives C++, but all such arguments can be customized both for Sphinx and LaTeX output.

### Wiki Formats

-----

There are many different wiki formats, but Doconce only supports three: `U{Googlecode wiki<http://code.google.com/p/support/wiki/WikiSyntax>}`,

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U{MediaWiki<<http://www.mediawiki.org/wiki/Help:Formatting>>}, and  
 U{Creole Wiki<<http://www.wikicreole.org/wiki/Creole1.0>>}.  
 These formats are called  
 C{gwiki}, C{mwiki}, and C{cwiki}, respectively.  
 Transformation from Doconce to these formats is done by::

```
Terminal> doconce format gwiki mydoc.do.txt
Terminal> doconce format mwiki mydoc.do.txt
Terminal> doconce format cwiki mydoc.do.txt
```

The produced MediaWiki can be tested in the U{sandbox of  
[wikibooks.org](http://en.wikibooks.org/wiki/Sandbox)<<http://en.wikibooks.org/wiki/Sandbox>>}. The format  
 works well with Wikipedia, Wikibooks, and  
 U{ShoutWiki<[http://doconcedemo.shoutwiki.com/wiki/Doconce\\_demo\\_page](http://doconcedemo.shoutwiki.com/wiki/Doconce_demo_page)>},  
 but not always well elsewhere  
 (see U{this example<[http://doconcedemo.jumpwiki.com/wiki/First\\_demo](http://doconcedemo.jumpwiki.com/wiki/First_demo)>}).

Large MediaWiki documents can be made with the  
 U{Book creator<[http://en.wikipedia.org/w/index.php?title=Special:Book&bookcmd=book\\_creator](http://en.wikipedia.org/w/index.php?title=Special:Book&bookcmd=book_creator)>}.  
 From the MediaWiki format one can go to other formats with aid  
 of U{mwlib<<http://pediapress.com/code/>>}. This means that one can  
 easily use Doconce to write U{Wikibooks<<http://en.wikibooks.org>>}  
 and publish these in PDF and MediaWiki format, while  
 at the same time, the book can also be published as a  
 standard LaTeX book, a Sphinx web document, or a collection of HTML files.

The Googlecode wiki document, C{mydoc.gwiki}, is most conveniently stored  
 in a directory which is a clone of the wiki part of the Googlecode project.  
 This is far easier than copying and pasting the entire text into the  
 wiki editor in a web browser.

When the Doconce file contains figures, each figure filename must in  
 the C{.gwiki} file be replaced by a URL where the figure is  
 available. There are instructions in the file for doing this. Usually,  
 one performs this substitution automatically (see next section).

### Tweaking the Doconce Output

-----

Occasionally, one would like to tweak the output in a certain format  
 from Doconce. One example is figure filenames when transforming  
 Doconce to reStructuredText. Since Doconce does not know if the  
 C{.rst} file is going to be filtered to LaTeX or HTML, it cannot know  
 if C{.eps} or C{.png} is the most appropriate image filename.  
 The solution is to use a text substitution command or code with, e.g., sed,  
 perl, python, or scitools subst, to automatically edit the output file  
 from Doconce. It is then wise to run Doconce and the editing commands  
 from a script to automate all steps in going from Doconce to the final  
 format(s). The C{make.sh} files in C{docs/manual} and C{docs/tutorial}  
 constitute comprehensive examples on how such scripts can be made.

### Demos

-----

” **tutorial.epytext** ”

The current text is generated from a Doconce format stored in the file::

```
docs/tutorial/tutorial.do.txt
```

The file C{make.sh} in the C{tutorial} directory of the Doconce source code contains a demo of how to produce a variety of formats. The source of this tutorial, C{tutorial.do.txt} is the starting point. Running C{make.sh} and studying the various generated files and comparing them with the original C{tutorial.do.txt} file, gives a quick introduction to how Doconce is used in a real case. U{Here<<https://doconce.googlecode.com/hg/doc/demos/tutorial/index.html>>} is a sample of how this tutorial looks in different formats.

There is another demo in the C{docs/manual} directory which translates the more comprehensive documentation, C{manual.do.txt}, to various formats. The C{make.sh} script runs a set of translations.

#### Installation of Doconce and its Dependencies

=====

#### Doconce

-----

Doconce itself is pure Python code hosted at U{<http://code.google.com/p/doconce><<http://code.google.com/p/doconce>>}. Its installation from the Mercurial (C{hg}) source follows the standard procedure::

```
# Doconce
hg clone https://code.google.com/p/doconce/ doconce
cd doconce
sudo python setup.py install
cd ..
```

Since Doconce is frequently updated, it is recommended to use the above procedure and whenever a problem occurs, make sure to update to the most recent version::

```
cd doconce
hg pull
hg update
sudo python setup.py install
```

Debian GNU/Linux users can also run::

```
sudo apt-get install doconce
```

This installs the latest release and not the most updated and bugfixed version.

On Ubuntu one needs to run::

```
sudo add-apt-repository ppa:scitools/ppa
sudo apt-get update
```



” **tutorial.epytext** ”

```
sudo apt-get install doconce
```

#### Dependencies

-----

#### Preprocessors

~~~~~

If you make use of the U{Preprocess<<http://code.google.com/p/preprocess/>>} preprocessor, this program must be installed::

```
svn checkout http://preprocess.googlecode.com/svn/trunk/ preprocess
cd preprocess
cd doconce
sudo python setup.py install
cd ..
```

A much more advanced alternative to Preprocess is U{Mako<<http://www.makotemplates.org/>>}. Its installation is most conveniently done by C{pip}::

```
pip install Mako
```

This command requires C{pip} to be installed. On Debian Linux systems, such as Ubuntu, the installation is simply done by::

```
sudo apt-get install python-pip
```

Alternatively, one can install from the C{pip} U{source code<<http://pypi.python.org/pypi/pip/>>}.

Mako can also be installed directly from U{source<<http://www.makotemplates.org/download.html>>}: download the tarball, pack it out, go to the directory and run the usual C{sudo python setup.py install}.

Image file handling

~~~~~

Different output formats require different formats of image files. For example, PostScript or Encapsulated PostScript is required for C{latex} output, while HTML needs JPEG, GIF, or PNG formats. Doconce calls up programs from the ImageMagick suite for converting image files to a proper format if needed. The U{ImageMagick suite<<http://www.imagemagick.org/script/index.php>>} can be installed on all major platforms. On Debian Linux (including Ubuntu) systems one can simply write::

```
sudo apt-get install imagemagick
```

The convenience program C{doconce combine\_images}, for combining several images into one, will use C{montage} and C{convert} from ImageMagick and the C{pdftk}, C{pdfnup}, and C{pdfcrop} programs from the C{texlive-extra-utils}

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Debian package. The latter gets installed by::

```
sudo apt-get install texlive-extra-utils
```

### Spellcheck ~~~~~

The utility `C{doconce spellcheck}` applies the `C{ispell}` program for spellcheck. On Debian (including Ubuntu) it is installed by::

```
sudo apt-get install ispell
```

### Ptex2tex for LaTeX Output ~~~~~

To make LaTeX documents with very flexible choice of typesetting of verbatim code blocks you need `U{ptex2tex<http://code.google.com/p/ptex2tex>}`, which is installed by::

```
svn checkout http://ptex2tex.googlecode.com/svn/trunk/ ptex2tex
cd ptex2tex
sudo python setup.py install
```

It may happen that you need additional style files, you can run a script, `C{cp2texmf.sh}`::

```
cd latex
sh cp2texmf.sh # copy stylefiles to ~/texmf directory
cd ../../
```

This script copies some special stylefiles that `C{ptex2tex}` potentially makes use of. Some more standard stylefiles are also needed. These are installed by::

```
sudo apt-get install texlive-latex-recommended texlive-latex-extra
```

on Debian Linux (including Ubuntu) systems. TeXShop on Mac comes with the necessary stylefiles (if not, they can be found by googling and installed manually in the `C{~/texmf/tex/latex/misc}` directory).

Note that the `C{doconce ptex2tex}` command, which needs no installation beyond Doconce itself, can be used as a simpler alternative to the `C{ptex2tex}` program.

The `I{minted}` LaTeX style is offered by `C{ptex2tex}` and `C{doconce ptext2tex}` and popular among many users. This style requires the package `U{Pygments<http://pygments.org>}` to be installed. On Debian Linux::

```
sudo apt-get install python-pygments
```

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Alternatively, the package can be installed manually::

```
hg clone ssh://hg@bitbucket.org/birkenfeld/pygments-main pygments
cd pygments
sudo python setup.py install
```

If you use the minted style together with `C{ptex2tex}`, you have to enable it by the `C{-DMINTED}` command-line argument to `C{ptex2tex}`. This is not necessary if you run the alternative `C{doconce ptex2tex}` program.

All use of the minted style requires the `C{-shell-escape}` command-line argument when running LaTeX, i.e., `C{latex -shell-escape}` or `C{pdflatex -shell-escape}`.

### reStructuredText (reST) Output

~~~~~

The `C{rst}` output from Doconce allows further transformation to LaTeX, HTML, XML, OpenOffice, and so on, through the `U{docutils<http://docutils.sourceforge.net>}` package. The installation of the most recent version can be done by::

```
svn checkout http://docutils.svn.sourceforge.net/svnroot/docutils/trunk/
docutils
cd docutils
sudo python setup.py install
cd ..
```

To use the OpenOffice suite you will typically on Debian systems install::

```
sudo apt-get install unovonv libreoffice libreoffice-dmaths
```

There is a possibility to create PDF files from reST documents using ReportLab instead of LaTeX. The enabling software is `U{rst2pdf<http://code.google.com/p/rst2pdf>}`. Either download the tarball or clone the svn repository, go to the `C{rst2pdf}` directory and run the usual `C{sudo python setup.py install}`.

Output to `C{sphinx}` requires of course the `U{Sphinx software<http://sphinx.pocoo.org>}`, installed by::

```
hg clone https://bitbucket.org/birkenfeld/sphinx
cd sphinx
sudo python setup.py install
cd ..
```

Markdown and Pandoc Output

~~~~~

” **tutorial.epytext** ”

The Doconce format C{pandoc} outputs the document in the Pandoc extended Markdown format, which via the C{pandoc} program can be translated to a range of other formats. Installation of U{Pandoc<<http://johnmacfarlane.net/pandoc/>>}, written in Haskell, is most easily done by::

```
sudo apt-get install pandoc
```

on Debian (Ubuntu) systems.

Epydoc Output

~~~~~

When the output format is C{epydodoc} one needs that program too, installed by::

```
epydodoc  svn co https://epydodoc.svn.sourceforge.net/svnroot/epydodoc/trunk/epydodoc epydodoc
           cd epydodoc
           sudo make install
           cd ..
```

I{Remark.} Several of the packages above installed from source code are also available in Debian-based system through the C{apt-get install} command. However, we recommend installation directly from the version control system repository as there might be important updates and bug fixes. For C{svn} directories, go to the directory, run C{svn update}, and then C{sudo python setup.py install}. For Mercurial (C{hg}) directories, go to the directory, run C{hg pull; hg update}, and then C{sudo python setup.py install}.

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<wiki:comment> Missing: FIGURE, MOVIE, environments </wiki:comment>

#summary Doconce: Document Once, Include Anywhere

By *Hans Petter Langtangen*

==== Jan 30, 2013 ====

* When writing a note, report, manual, etc., do you find it difficult to choose the typesetting format? That is, to choose between plain (email-like) text, wiki, Word/OpenOffice, LaTeX, HTML, reStructuredText, Sphinx, XML, etc. Would it be convenient to start with some very simple text-like format that easily converts to the formats listed above, and then at some later stage eventually go with a particular format?

* Do you need to write documents in varying formats but find it difficult to remember all the typesetting details of various formats like [<http://refcards.com/docs/silvermanj/amslatex/LaTeXRefCard.v2.0.pdf> LaTeX], [<http://www.htmlcodetutorial.com/HTML>], [<http://docutils.sourceforge.net/docs/ref/rst/restructuredtext.html> reStructuredText], [<http://sphinx.pocoo.org/contents.html> Sphinx], and [<http://code.google.com/p/support/wiki/WikiSyntax> wiki]? Would it be convenient to generate the typesetting details of a particular format from a very simple text-like format with minimal tagging?

* Do you have the same information scattered around in different documents in different typesetting formats? Would it be a good idea to write things once, in one format, stored in one place, and include it anywhere?

If any of these questions are of interest, you should keep on reading.

== What Does Doconce Look Like? ==

Doconce text looks like ordinary text, but there are some almost invisible text constructions that allow you to control the formatting. Here are some examples.

- * Bullet lists arise from lines starting with `*`.
- * *Emphasized words* are surrounded by `*`.
- * **Words in boldface** are surrounded by underscores.
- * Words from computer code are enclosed in back quotes and then typeset `verbatim` (in a monospace font).

- * Section headings are recognized by equality (=) signs before and after the title, and the number of = signs indicates the level of the section: 7 for main section, 5 for subsection, and 3 for subsubsection.

- * Paragraph headings are recognized by a double underscore before and after the heading.

- * The abstract of a document starts with *Abstract* as paragraph heading, and all text up to the next heading makes up the abstract,

- * Blocks of computer code can easily be included by placing `!bc` (begin code) and `!ec` (end code) commands at separate lines before and after the code block.

- * Blocks of computer code can also be imported from source files.

- * Blocks of LaTeX mathematics can easily be included by placing `!bt` (begin TeX) and `!et` (end TeX) commands at separate lines before and after the math block.

- * There is support for both LaTeX and text-like inline mathematics.

- * Figures and movies with captions, simple tables, URLs with links, index list, labels and references are supported.

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* Invisible comments in the output format can be inserted throughout the text.
 * Visible comments can be inserted so that authors and readers can comment upon the text (and at any time turn on/off output of such comments).
 * There is an exercise environment with many advanced features.
 * With a preprocessor, Preprocess or Mako, one can include other documents (files) and large portions of text can be defined in or out of the text.
 * With Mako one can also have Python code embedded in the Doconce document and thereby parameterize the text (e.g., one text can describe programming in two languages).

Here is an example of some simple text written in the Doconce format:

```
{{{
===== A Subsection with Sample Text =====
label{my:first:sec}
```

Ordinary text looks like ordinary text, and the tags used for boldface words, **emphasized** words, and 'computer' words look natural in plain text. Lists are typeset as you would do in email,

- * item 1
- * item 2
- * item 3

Lists can also have automatically numbered items instead of bullets,

- o item 1
- o item 2
- o item 3

URLs with a link word are possible, as in "hpl": "http://folk.uio.no/hpl". If the word is URL, the URL itself becomes the link name, as in "URL": "tutorial.do.txt".

References to sections may use logical names as labels (e.g., a "label" command right after the section title), as in the reference to Section ref{my:first:sec}.

Doconce also allows inline comments of the form [name: comment] (with a space after 'name:'), e.g., such as [hpl: here I will make some remarks to the text]. Inline comments can be removed from the output by a command-line argument (see Section ref{doconce2formats} for an example).

Tables are also supported, e.g.,

time	velocity	acceleration
0.0	1.4186	-5.01
2.0	1.376512	11.919
4.0	1.1E+1	14.717624

lines beginning with # are comment lines
 }}}}

The Doconce text above results in the following little document:

```
===== A Subsection with Sample Text =====
```

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Ordinary text looks like ordinary text, and the tags used for ***boldface*** words, **emphasized** words, and ``computer`` words look natural in plain text. Lists are typeset as you would do in an email,

- * item 1
- * item 2
- * item 3

Lists can also have numbered items instead of bullets, just use an ``o`` (for ordered) instead of the asterisk:

- # item 1
- # item 2
- # item 3

URLs with a link word are possible, as in `[http://folk.uio.no/hpl hpl]`. If the word is URL, the URL itself becomes the link name, as in `tutorial.do.txt`.

References to sections may use logical names as labels (e.g., a "label" command right after the section title), as in the reference to the section `[#A_Subsection_with_Sample_Text]`.

Doconce also allows inline comments such as `[hpl: here I will make some remarks to the text]` for allowing authors to make notes. Inline comments can be removed from the output by a command-line argument (see the section `[#From_Doconce_to_Other_Formats]` for an example).

Tables are also supported, e.g.,

<code>*time*</code>	<code>*velocity*</code>	<code>*acceleration*</code>
0.0	1.4186	-5.01
2.0	1.376512	11.919
4.0	1.1E+1	14.717624

==== Mathematics and Computer Code ====

Inline mathematics, such as ``v = sin(x)``, allows the formula to be specified both as LaTeX and as plain text. This results in a professional LaTeX typesetting, but in other formats the text version normally looks better than raw LaTeX mathematics with backslashes. An inline formula like ``v = sin(x)`` is typeset as

```
{
  {
    $ \nu = \sin(x) $ | $ v = \sin(x) $
  }
}
```

The pipe symbol acts as a delimiter between LaTeX code and the plain text version of the formula. If you write a lot of mathematics, only the output formats ``latex``, ``pdflatex``, ``html``, ``sphinx``, and ``pandoc`` are of interest

and all these support inline LaTeX mathematics so then you will naturally drop the pipe symbol and write just

```
{
  {
```

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```
$\nu = \sin(x)$
}}}
```

However, if you want more textual formats, like plain text or reStructuredText, the text after the pipe symbol may help to make the math formula more readable if there are backslashes or other special LaTeX symbols in the LaTeX code.

Blocks of mathematics are typeset with raw LaTeX, inside `!bt` and `!et` (begin TeX, end TeX) instructions:

```
{{{
!bt
\begin{align}
{\partial u \over \partial t} &= \nabla^2 u + f, \text{label{myeq1}} \\
{\partial v \over \partial t} &= \nabla \cdot (q(u) \nabla v) + g
\end{align}
!et
}}}
```

<wiki:comment> Note: `!bt` and `!et` (and `!bc` and `!ec` below) are used to illustrate
</wiki:comment>

<wiki:comment> tex and code blocks in inside verbatim blocks and are replaced </wiki:comment>

<wiki:comment> by `!bt`, `!et`, `!bc`, and `!ec` after all other formatting is finished.
</wiki:comment>

The result looks like this:

```
{{{
\begin{align}
{\partial u \over \partial t} &= \nabla^2 u + f, \text{label{myeq1}} \\
{\partial v \over \partial t} &= \nabla \cdot (q(u) \nabla v) + g
\end{align}
}}}
```

Of course, such blocks only looks nice in formats with support for LaTeX mathematics, and here the align environment in particular (this includes `'latex'`, `'pdflatex'`, `'html'`, and `'sphinx'`). The raw LaTeX syntax appears in simpler formats, but can still be useful for those who can read LaTeX syntax.

You can have blocks of computer code, starting and ending with `!bc` and `!ec` instructions, respectively.

```
{{{
!bc pycod
from math import sin, pi
def myfunc(x):
    return sin(pi*x)

import integrate
I = integrate.trapezoidal(myfunc, 0, pi, 100)
!ec
}}}
```

Such blocks are formatted as

```
{{{
from math import sin, pi
def myfunc(x):
    return sin(pi*x)

import integrate
I = integrate.trapezoidal(myfunc, 0, pi, 100)
```


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```
}}}
```

A code block must come after some plain sentence (at least for successful output to 'sphinx', 'rst', and ASCII-close formats), not directly after a section/paragraph heading or a table.

One can also copy computer code directly from files, either the complete file or specified parts. Computer code is then never duplicated in the documentation (important for the principle of avoiding copying information!).

Another document can be included by writing '# #include "mynote.do.txt"' at the beginning of a line. Doconce documents have extension 'do.txt'. The 'do' part stands for doconce, while the trailing '.txt' denotes a text document so that editors gives you plain text editing capabilities.

==== Macros (Newcommands), Cross-References, Index, and Bibliography ====

Doconce supports a type of macros via a LaTeX-style `*newcommand*` construction. The newcommands defined in a file with name 'newcommand_replace.tex' are expanded when Doconce is filtered to other formats, except for LaTeX (since LaTeX performs the expansion itself). Newcommands in files with names 'newcommands.tex' and 'newcommands_keep.tex' are kept unaltered when Doconce text is filtered to other formats, except for the Sphinx format. Since Sphinx understands LaTeX math, but not newcommands if the Sphinx output is HTML, it makes most sense to expand all newcommands. Normally, a user will put all newcommands that appear in math blocks surrounded by '!bt' and '!et' in 'newcommands_keep.tex' to keep them unchanged, at least if they contribute to make the raw LaTeX math text easier to read in the formats that cannot render LaTeX. Newcommands used elsewhere throughout the text will usually be placed in 'newcommands_replace.tex' and expanded by Doconce. The definitions of newcommands in the 'newcommands*.tex' files *must* appear on a single line (multi-line newcommands are too hard to parse with regular expressions).

Recent versions of Doconce also offer cross referencing, typically one can define labels below (sub)sections, in figure captions, or in equations, and then refer to these later. Entries in an index can be defined and result in an index at the end for the LaTeX and Sphinx formats. Citations to literature, with an accompanying bibliography in a file, are also supported. The syntax of labels, references, citations, and the bibliography closely resembles that of LaTeX, making it easy for Doconce documents to be integrated in LaTeX projects (manuals, books). For further details on functionality and syntax we refer to the 'doc/manual/manual.do.txt' file (see the [https://doconce.googlecode.com/hg/doc/demos/manual/index.html demo page] for various formats of this document).

```
<wiki:comment> Example on including another Doconce file (using preprocess): </wiki:comment>
```

== From Doconce to Other Formats ==

”

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”

Transformation of a Doconce document 'mydoc.do.txt' to various other formats applies the script 'doconce format':

```

{{{
Terminal> doconce format format mydoc.do.txt
}}}
or just
{{{
Terminal> doconce format format mydoc
}}}

```

==== Preprocessing ====

The 'preprocess' and 'mako' programs are used to preprocess the file, and options to 'preprocess' and/or 'mako' can be added after the filename. For example,

```

{{{
Terminal> doconce format latex mydoc -Dextra_sections -DVAR1=5      # preprocess
Terminal> doconce format latex yourdoc extra_sections=True VAR1=5  # mako
}}}

```

The variable 'FORMAT' is always defined as the current format when running 'preprocess' or 'mako'. That is, in the last example, 'FORMAT' is defined as 'latex'. Inside the Doconce document one can then perform format specific actions through tests like '#if FORMAT == "latex"' (for 'preprocess') or '% if FORMAT == "latex":' (for 'mako').

==== Removal of inline comments ====

<wiki:comment> mention notes also </wiki:comment>

The command-line arguments '--no-preprocess' and '--no-mako' turn off running 'preprocess' and 'mako', respectively.

Inline comments in the text are removed from the output by

```

{{{
Terminal> doconce format latex mydoc --skip_inline_comments
}}}

```

One can also remove all such comments from the original Doconce file by running:

```

{{{
Terminal> doconce remove_inline_comments mydoc
}}}

```

This action is convenient when a Doconce document reaches its final form and comments by different authors should be removed.

==== HTML ====

Making an HTML version of a Doconce file 'mydoc.do.txt' is performed by

```

{{{
Terminal> doconce format html mydoc
}}}

```

The resulting file 'mydoc.html' can be loaded into any web browser for viewing.

The HTML style can be defined either in the header of the HTML file or in an external CSS file. The latter is enabled by the command-line argument '--css=filename'. There is a default style with blue headings, and a style with the [http://ethanschoonover.com/solarized solarized] color palette, specified by the '--html-solarized' command line argument. If there is no file with name 'filename' in the '--css=filename'

”

”

”

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specification, the blue or solarized styles are written to 'filename' and linked from the HTML document. You can provide your own style sheet either by replacing the content inside the 'style' tags or by specifying a CSS file through the '--css=filename' option.

If the Pygments package (including the 'pygmentize' program) is installed, code blocks are typeset with aid of this package. The command-line argument '--no-pygments-html' turns off the use of Pygments and makes code blocks appear with plain ('pre') HTML tags. The option '--pygments-html-linenos' turns on line numbers in Pygments-formatted code blocks.

The HTML file can be embedded in a template if the Doconce document does not have a title (because then there will be no header and footer in the HTML file). The template file must contain valid HTML code and can have three "slots": '%(title)s' for a title, '%(date)s' for a date, and '%(main)s' for the main body of text, i.e., the Doconce document translated to HTML. The title becomes the first heading in the Doconce document, and the date is extracted from the 'DATE:' line, if present. With the template feature one can easily embed the text in the look and feel of a website. The template can be extracted from the source code of a page at the site; just insert '%(title)s' and '%(date)s' at appropriate places and replace the main bod of text by '%(main)s'. Here is an example:

```
{
Terminal> doconce format html mydoc --html-template=mytemplate.html
}
```

==== Blogs ====

Doconce can be used for writing blogs provided the blog site accepts raw HTML code. Google's Blogger service ('blogname.blogspot.com') is particularly well suited since it also allows extensive LaTeX mathematics via MathJax.

Write the blog text as a Doconce document without any title, author, and date. Then generate HTML as described above. Copy the text and paste it into the text area in the blog, making sure the input format is HTML. On Google's Blogger service you can use Doconce to generate blogs with LaTeX mathematics and pretty (pygmentized) blocks of computer code. See a [<http://doconce.blogspot.no> blog example] for details on blogging.

Warning. In the comments after the blog one cannot paste raw HTML code with MathJax scripts so there is no support for mathematics in the comments.

WordPress ('wordpress.com') allows raw HTML code in blogs, but has very limited LaTeX support, basically only formulas. The '--wordpress' option to 'doconce' modifies the HTML code such that all equations are typeset in a way that is acceptable to WordPress. There is a [<http://doconce.wordpress.com> doconce example] on blogging with mathematics and code on WordPress.

==== Pandoc and Markdown ====

Output in Pandoc's extended Markdown format results from

```
{
```

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```
Terminal> doconce format pandoc mydoc
}}}
```

The name of the output file is 'mydoc.mkd'.

From this format one can go to numerous other formats:

```
{{{
Terminal> pandoc -R -t mediawiki -o mydoc.mwk --toc mydoc.mkd
}}}
```

Pandoc supports 'latex', 'html', 'odt' (OpenOffice), 'docx' (Microsoft Word), 'rtf', 'texinfo', to mention some. The '-R' option makes Pandoc pass raw HTML or LaTeX to the output format instead of ignoring it, while the '--toc' option generates a table of contents. See the [<http://johnmacfarlane.net/pandoc/README.html> Pandoc documentation] for the many features of the 'pandoc' program.

Pandoc is useful to go from LaTeX mathematics to, e.g., HTML or MS Word. There are two ways (experiment to find the best one for your document): 'doconce format pandoc' and then translating using 'pandoc', or 'doconce format latex', and then going from LaTeX to the desired format using 'pandoc'.

Here is an example on the latter strategy:

```
{{{
Terminal> doconce format latex mydoc
Terminal> doconce ptex2tex mydoc
Terminal> doconce replace '\Verb!' '\verb!' mydoc.tex
Terminal> pandoc -f latex -t docx -o mydoc.docx mydoc.tex
}}}
```

When we go through 'pandoc', only single equations or 'align*' environments are well understood.

Note that Doconce applies the 'Verb' macro from the 'fancyvrb' package while 'pandoc' only supports the standard 'verb' construction for inline verbatim text. Moreover, quite some additional 'doconce replace' and 'doconce subst' edits might be needed on the '.mkd' or '.tex' files to successfully have mathematics that is well translated to MS Word. Also when going to reStructuredText using Pandoc, it can be advantageous to go via LaTeX.

Here is an example where we take a Doconce snippet (without title, author, and date), maybe with some unnumbered equations, and quickly generate HTML with mathematics displayed my MathJax:

```
{{{
Terminal> doconce format pandoc mydoc
Terminal> pandoc -t html -o mydoc.html -s --mathjax mydoc.mkd
}}}
```

The '-s' option adds a proper header and footer to the 'mydoc.html' file. This recipe is a quick way of making HTML notes with (some) mathematics.

==== LaTeX ====

Making a LaTeX file 'mydoc.tex' from 'mydoc.do.txt' is done in two steps:

```
<wiki:comment> Note: putting code blocks inside a list is not successful in many
</wiki:comment>
<wiki:comment> formats - the text may be messed up. A better choice is a paragraph
</wiki:comment>
<wiki:comment> environment, as used here. </wiki:comment>
```

Step 1. Filter the doconce text to a pre-LaTeX form 'mydoc.p.tex' for the 'ptex2tex' program (or 'doconce ptex2tex'):

```
{{{
```

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```
Terminal> doconce format latex mydoc
}}}
```

LaTeX-specific commands ("newcommands") in math formulas and similar can be placed in files 'newcommands.tex', 'newcommands_keep.tex', or 'newcommands_replace.tex' (see the section [Macros_(Newcommands),_Cross-References,_Index,_and_Bibliography]).

If these files are present, they are included in the LaTeX document so that your commands are defined.

An option '--latex-printed' makes some adjustments for documents aimed at being printed. For example, links to web resources are associated with a footnote listing the complete web address (URL).

Step 2. Run 'ptex2tex' (if you have it) to make a standard LaTeX file,

```
{{{
Terminal> ptex2tex mydoc
}}}
```

In case you do not have 'ptex2tex', you may run a (very) simplified version:

```
{{{
Terminal> doconce ptex2tex mydoc
}}}
```

Note that Doconce generates a '.p.tex' file with some preprocessor macros that can be used to steer certain properties of the LaTeX document. For example, to turn on the Helvetica font instead of the standard Computer Modern font, run

```
{{{
Terminal> ptex2tex -DHELVETICA mydoc
Terminal> doconce ptex2tex mydoc -DHELVETICA # alternative
}}}
```

The title, authors, and date are by default typeset in a non-standard way to enable a nicer treatment of multiple authors having institutions in common. However, the standard LaTeX "maketitle" heading is also available through '-DLATEX_HEADING=traditional'.

A separate titlepage can be generate by
'-DLATEX_HEADING=titlepage'.

Preprocessor variables to be defined or undefined are

- * 'BOOK' for the "book" documentclass rather than the standard "article" class (necessary if you apply chapter headings)
- * 'PALATINO' for the Palatino font
- * 'HELVETIA' for the Helvetica font
- * 'A4PAPER' for A4 paper size
- * 'A6PAPER' for A6 paper size (suitable for reading on small devices)
- * 'MOVIE15' for using the movie15 LaTeX package to display movies
- * 'PREAMBLE' to turn the LaTeX preamble on or off (i.e., complete document or document to be included elsewhere)
- * 'MINTED' for inclusion of the minted package (which requires 'latex' or 'pdflatex' to be run with the '-shell-escape' option)

The 'ptex2tex' tool makes it possible to easily switch between many different fancy formattings of computer or verbatim code in LaTeX documents. After any '!bc' command in the Doconce source you can insert verbatim block styles as defined in your '.ptex2tex.cfg' file, e.g., '!bc sys' for a terminal session, where 'sys' is set to a certain environment in '.ptex2tex.cfg' (e.g., 'CodeTerminal'). There are about 40 styles to choose from, and you can easily add

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new ones.

Also the `'doconce ptex2tex'` command supports preprocessor directives for processing the `'.p.tex'` file. The command allows specifications of code environments as well. Here is an example:

```

{{{
Terminal> doconce ptex2tex mydoc -DLATEX_HEADING=traditional \
        -DPALATINO -DA6PAPER \
        "sys=\begin{quote}\begin{verbatim}@\\end{verbatim}\\end{quote}" \
        fpro=minted fcod=minted shcod=Verbatim envir=ans:nt
}}}
```

Note that `'@'` must be used to separate the begin and end LaTeX commands, unless only the environment name is given (such as `'minted'` above, which implies `'\begin{minted}{fortran}'` and `'\end{minted}'` as begin and end for blocks inside `'!bc fpro'` and `'!ec'`). Specifying `'envir=ans:nt'` means that all other environments are typeset with the `'anslistings.sty'` package, e.g., `'!bc cppcod'` will then result in `'\begin{c++}'`. If no environments like `'sys'`, `'fpro'`, or the common `'envir'` are defined on the command line, the plain `'\begin{verbatim}'` and `'\end{verbatim}'` used.

Step 2b (optional). Edit the `'mydoc.tex'` file to your needs. For example, you may want to substitute `'section'` by `'section*'` to avoid numbering of sections, you may want to insert linebreaks (and perhaps space) in the title, etc. This can be automatically edited with the aid of the `'doconce replace'` and `'doconce subst'` commands. The former works with substituting text directly, while the latter performs substitutions using regular expressions.

Here are two examples:

```

{{{
Terminal> doconce replace 'section{' 'section*{' mydoc.tex
Terminal> doconce subst 'title\{((+)Using (.+)\}\}' \
        'title{\g<1> \\\[1.5mm] Using \g<2>}' mydoc.tex
}}}
```

A lot of tailored fixes to the LaTeX document can be done by an appropriate set of text replacements and regular expression substitutions. You are anyway encouraged to make a script for generating PDF from the LaTeX file.

Step 3. Compile `'mydoc.tex'` and create the PDF file:

```

{{{
Terminal> latex mydoc
Terminal> latex mydoc
Terminal> makeindex mydoc      # if index
Terminal> bibitem mydoc       # if bibliography
Terminal> latex mydoc
Terminal> dvipdf mydoc
}}}
```

If one wishes to run `'ptex2tex'` and use the minted LaTeX package for typesetting code blocks (`'Minted_Python'`, `'Minted_Cpp'`, etc., in `'ptex2tex'` specified through the `'*pro'` and `'*cod'` variables in `'.ptex2tex.cfg'` or `'$HOME/.ptex2tex.cfg'`), the minted LaTeX package is needed. This package is included by running `'ptex2tex'` with the `'-DMINTED'` option:

```

{{{
Terminal> ptex2tex -DMINTED mydoc
}}
```

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```
}}}
```

In this case, 'latex' must be run with the '-shell-escape' option:

```
{{{
Terminal> latex -shell-escape mydoc
Terminal> latex -shell-escape mydoc
Terminal> makeindex mydoc      # if index
Terminal> bibitem mydoc       # if bibliography
Terminal> latex -shell-escape mydoc
Terminal> dvipdf mydoc
}}}
```

When running 'doconce ptex2tex mydoc envir=minted' (or other minted specifications with 'doconce ptex2tex'), the minted package is automatically included so there is no need for the '-DMINTED' option.

==== PDFLaTeX ====

Running 'pdflatex' instead of 'latex' follows almost the same steps, but the start is

```
{{{
Terminal> doconce format latex mydoc
}}}
```

Then 'ptex2tex' is run as explained above, and finally

```
{{{
Terminal> pdflatex -shell-escape mydoc
Terminal> makeindex mydoc      # if index
Terminal> bibitem mydoc       # if bibliography
Terminal> pdflatex -shell-escape mydoc
}}}
```

==== Plain ASCII Text ====

We can go from Doconce "back to" plain untagged text suitable for viewing in terminal windows, inclusion in email text, or for insertion in computer source code:

```
{{{
Terminal> doconce format plain mydoc.do.txt  # results in mydoc.txt
}}}
```

==== reStructuredText ====

Going from Doconce to reStructuredText gives a lot of possibilities to go to other formats. First we filter the Doconce text to a reStructuredText file 'mydoc.rst':

```
{{{
Terminal> doconce format rst mydoc.do.txt
}}}
```

We may now produce various other formats:

```
{{{
Terminal> rst2html.py  mydoc.rst > mydoc.html # html
Terminal> rst2latex.py mydoc.rst > mydoc.tex  # latex
Terminal> rst2xml.py   mydoc.rst > mydoc.xml   # XML
Terminal> rst2odt.py   mydoc.rst > mydoc.odt   # OpenOffice
}}}
```

The OpenOffice file 'mydoc.odt' can be loaded into OpenOffice and saved in, among other things, the RTF format or the Microsoft Word format. However, it is more convenient to use the program 'unovonv' to convert between the many formats OpenOffice supports *on the command line*.

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```
Run
{{{
Terminal> unoconv --show
}}}
```

to see all the formats that are supported.
For example, the following commands take
'mydoc.odt' to Microsoft Office Open XML format,
classic MS Word format, and PDF:

```
{{{
Terminal> unoconv -f ooxml mydoc.odt
Terminal> unoconv -f doc mydoc.odt
Terminal> unoconv -f pdf mydoc.odt
}}}
```

Remark about Mathematical Typesetting. At the time of this writing, there is no easy way to go from Doconce and LaTeX mathematics to reST and further to OpenOffice and the "MS Word world". Mathematics is only fully supported by 'latex' as output and to a wide extent also supported by the 'sphinx' output format. Some links for going from LaTeX to Word are listed below.

- * <http://ubuntuforums.org/showthread.php?t=1033441>
- * <http://tug.org/utilities/texconv/textopc.html>
- * <http://nileshbansal.blogspot.com/2007/12/latex-to-openofficeword.html>

==== Sphinx ====

Sphinx documents demand quite some steps in their creation. We have automated most of the steps through the 'doconce sphinx_dir' command:

```
{{{
Terminal> doconce sphinx_dir author="authors' names" \
           title="some title" version=1.0 dirname=sphinxdir \
           theme=mytheme file1 file2 file3 ...
}}}
```

The keywords 'author', 'title', and 'version' are used in the headings of the Sphinx document. By default, 'version' is 1.0 and the script will try to deduce authors and title from the doconce files 'file1', 'file2', etc. that together represent the whole document. Note that none of the individual Doconce files 'file1', 'file2', etc. should include the rest as their union makes up the whole document. The default value of 'dirname' is 'sphinx-rootdir'. The 'theme' keyword is used to set the theme for design of HTML output from Sphinx (the default theme is 'default').

With a single-file document in 'mydoc.do.txt' one often just runs

```
{{{
Terminal> doconce sphinx_dir mydoc
}}}
```

and then an appropriate Sphinx directory 'sphinx-rootdir' is made with relevant files.

The 'doconce sphinx_dir' command generates a script 'automake_sphinx.py' for compiling the Sphinx document into an HTML document. One can either run 'automake_sphinx.py' or perform the steps in the script manually, possibly with necessary modifications. You should at least read the script prior to executing it to have some idea of what is done.

”

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”

The `'doconce sphinx_dir'` script copies directories named `'figs'` or `'figures'` over to the Sphinx directory so that figures are accessible in the Sphinx compilation. If figures or movies are located in other directories, `'automake_sphinx.py'` must be edited accordingly. Files, to which there are local links (not `'http:'` or `'file:'` URLs), must be placed in the `'_static'` subdirectory of the Sphinx directory. The utility `'doconce sphinxfix_localURLs'` is run to check for local links in the Doconce file: for each such link, say `'dir1/dir2/myfile.txt'` it replaces the link by `'_static/myfile.txt'` and copies `'dir1/dir2/myfile.txt'` to a local `'_static'` directory (in the same directory as the script is run). However, we recommend instead that the writer of the document places files in `'_static'` or lets a script do it automatically. The user must copy all `'_static/*'` files to the `'_static'` subdirectory of the Sphinx directory. It may be wise to always put files, to which there are local links in the Doconce document, in a `'_static'` or `'_static-name'` directory and use these local links. Then links do not need to be modified when creating a Sphinx version of the document.

Doconce comes with a collection of HTML themes for Sphinx documents. These are packed out in the Sphinx directory, the `'conf.py'` configuration file for Sphinx is edited accordingly, and a script `'make-themes.sh'` can make HTML documents with one or more themes.

For example,
to realize the themes `'fenics'` and `'pyramid'`, one writes

```
{{{
Terminal> ./make-themes.sh fenics pyramid
}}}
```

The resulting directories with HTML documents are `'_build/html_fenics'` and `'_build/html_pyramid'`, respectively. Without arguments, `'make-themes.sh'` makes all available themes (!).

If it is not desirable to use the autogenerated scripts explained above, here is the complete manual procedure of generating a Sphinx document from a file `'mydoc.do.txt'`.

Step 1. Translate Doconce into the Sphinx format:

```
{{{
Terminal> doconce format sphinx mydoc
}}}
```

Step 2. Create a Sphinx root directory either manually or by using the interactive `'sphinx-quickstart'` program. Here is a scripted version of the steps with the latter:

```
{{{
mkdir sphinx-rootdir
sphinx-quickstart <<EOF
sphinx-rootdir
n
—
Name of My Sphinx Document
Author
version
version
.rst
index
n
y
n
}}}
```

”

”

”

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```
n
n
n
Y
n
n
Y
Y
Y
EOF
}}}
```

The autogenerated `'conf.py'` file may need some edits if you want to specific layout (Sphinx themes) of HTML pages. The `'doconce sphinx_dir'` generator makes an extended `'conv.py'` file where, among other things, several useful Sphinx extensions are included.

Step 3. Copy the `'mydoc.rst'` file to the Sphinx root directory:

```
{{{
Terminal> cp mydoc.rst sphinx-rootdir
}}}
```

If you have figures in your document, the relative paths to those will be invalid when you work with `'mydoc.rst'` in the `'sphinx-rootdir'` directory. Either edit `'mydoc.rst'` so that figure file paths are correct, or simply copy your figure directories to `'sphinx-rootdir'`. Links to local files in `'mydoc.rst'` must be modified to links to files in the `'_static'` directory, see comment above.

Step 4. Edit the generated `'index.rst'` file so that `'mydoc.rst'` is included, i.e., add `'mydoc'` to the `'toctree'` section so that it becomes

```
{{{
.. toctree::
   :maxdepth: 2
```

```

   mydoc
}}}
```

(The spaces before `'mydoc'` are important!)

Step 5. Generate, for instance, an HTML version of the Sphinx source:

```
{{{
make clean    # remove old versions
make html
}}}
```

Sphinx can generate a range of different formats:

standalone HTML, HTML in separate directories with `'index.html'` files, a large single HTML file, JSON files, various help files (the `qthelp`, `HTML`, and `Devhelp` projects), `epub`, `LaTeX`, `PDF` (via `LaTeX`), `pure text`, `man pages`, and `Texinfo` files.

Step 6. View the result:

```
{{{
Terminal> firefox _build/html/index.html
}}}
```

Note that verbatim code blocks can be typeset in a variety of ways depending the argument that follows `'!bc'`: `'cod'` gives Python (`'code-block:: python'` in Sphinx syntax) and `'cppcod'` gives C++, but

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all such arguments can be customized both for Sphinx and LaTeX output.

==== Wiki Formats ====

There are many different wiki formats, but Doconce only supports three:
[\[http://code.google.com/p/support/wiki/WikiSyntax Googlecode wiki\]](http://code.google.com/p/support/wiki/WikiSyntax),
[\[http://www.mediawiki.org/wiki/Help:Formatting MediaWiki\]](http://www.mediawiki.org/wiki/Help:Formatting), and
[\[http://www.wikicreole.org/wiki/Creole1.0 Creole Wiki\]](http://www.wikicreole.org/wiki/Creole1.0).

These formats are called

'gwiki', 'mwiki', and 'cwiki', respectively.

Transformation from Doconce to these formats is done by

```
{{{
Terminal> doconce format gwiki mydoc.do.txt
Terminal> doconce format mwiki mydoc.do.txt
Terminal> doconce format cwiki mydoc.do.txt
}}}
```

The produced MediaWiki can be tested in the [\[http://en.wikibooks.org/wiki/Sandbox\]](http://en.wikibooks.org/wiki/Sandbox) sandbox of

[wikibooks.org](http://en.wikibooks.org). The format

works well with Wikipedia, Wikibooks, and

[\[http://doconcedemo.shoutwiki.com/wiki/Doconce_demo_page ShoutWiki\]](http://doconcedemo.shoutwiki.com/wiki/Doconce_demo_page),

but not always well elsewhere

(see [\[http://doconcedemo.jumpwiki.com/wiki/First_demo\]](http://doconcedemo.jumpwiki.com/wiki/First_demo) this example)).

Large MediaWiki documents can be made with the

[\[http://en.wikipedia.org/w/index.php?title=Special:Book&bookcmd=book_creator\]](http://en.wikipedia.org/w/index.php?title=Special:Book&bookcmd=book_creator) Book creator].

From the MediaWiki format one can go to other formats with aid

of [\[http://pediapress.com/code/mwlib\]](http://pediapress.com/code/mwlib). This means that one can

easily use Doconce to write [\[http://en.wikibooks.org Wikibooks\]](http://en.wikibooks.org)

and publish these in PDF and MediaWiki format, while

at the same time, the book can also be published as a

standard LaTeX book, a Sphinx web document, or a collection of HTML files.

The Googlecode wiki document, 'mydoc.gwiki', is most conveniently stored in a directory which is a clone of the wiki part of the Googlecode project. This is far easier than copying and pasting the entire text into the wiki editor in a web browser.

When the Doconce file contains figures, each figure filename must in the '.gwiki' file be replaced by a URL where the figure is available. There are instructions in the file for doing this. Usually, one performs this substitution automatically (see next section).

==== Tweaking the Doconce Output ====

Occasionally, one would like to tweak the output in a certain format

from Doconce. One example is figure filenames when transforming

Doconce to reStructuredText. Since Doconce does not know if the

'rst' file is going to be filtered to LaTeX or HTML, it cannot know

if '.eps' or '.png' is the most appropriate image filename.

The solution is to use a text substitution command or code with, e.g., sed,

perl, python, or scitools subst, to automatically edit the output file

from Doconce. It is then wise to run Doconce and the editing commands

from a script to automate all steps in going from Doconce to the final

format(s). The 'make.sh' files in 'docs/manual' and 'docs/tutorial'

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constitute comprehensive examples on how such scripts can be made.

==== Demos ====

The current text is generated from a Doconce format stored in the file
 {{{
 docs/tutorial/tutorial.do.txt
 }}}}

The file 'make.sh' in the 'tutorial' directory of the Doconce source code contains a demo of how to produce a variety of formats. The source of this tutorial, 'tutorial.do.txt' is the starting point. Running 'make.sh' and studying the various generated files and comparing them with the original 'tutorial.do.txt' file, gives a quick introduction to how Doconce is used in a real case. [<https://doconce.googlecode.com/hg/doc/demos/tutorial/index.html> Here] is a sample of how this tutorial looks in different formats.

There is another demo in the 'docs/manual' directory which translates the more comprehensive documentation, 'manual.do.txt', to various formats. The 'make.sh' script runs a set of translations.

== Installation of Doconce and its Dependencies ==

==== Doconce ====

Doconce itself is pure Python code hosted at <http://code.google.com/p/doconce>. Its installation from the Mercurial ('hg') source follows the standard procedure:

```

{{{
# Doconce
hg clone https://code.google.com/p/doconce/ doconce
cd doconce
sudo python setup.py install
cd ..
}}}
```

Since Doconce is frequently updated, it is recommended to use the above procedure and whenever a problem occurs, make sure to update to the most recent version:

```

{{{
cd doconce
hg pull
hg update
sudo python setup.py install
}}}
```

Debian GNU/Linux users can also run

```

{{{
sudo apt-get install doconce
}}}
```

This installs the latest release and not the most updated and bugfixed version.

On Ubuntu one needs to run

```

{{{
sudo add-apt-repository ppa:scitools/ppa
sudo apt-get update
sudo apt-get install doconce
}}}
```

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==== Dependencies ====

==== Preprocessors ====

If you make use of the [<http://code.google.com/p/preprocess> Preprocess] preprocessor, this program must be installed:

```
{{{
svn checkout http://preprocess.googlecode.com/svn/trunk/ preprocess
cd preprocess
cd doconce
sudo python setup.py install
cd ..
}}}
```

A much more advanced alternative to Preprocess is [<http://www.makotemplates.org> Mako]. Its installation is most conveniently done by 'pip',

```
{{{
pip install Mako
}}}
```

This command requires 'pip' to be installed. On Debian Linux systems, such as Ubuntu, the installation is simply done by

```
{{{
sudo apt-get install python-pip
}}}
```

Alternatively, one can install from the 'pip' [<http://pypi.python.org/pypi/pip> source code].

Mako can also be installed directly from [<http://www.makotemplates.org/download.html> source]: download the tarball, pack it out, go to the directory and run the usual 'sudo python setup.py install'.

==== Image file handling ====

Different output formats require different formats of image files. For example, PostScript or Encapsulated PostScript is required for 'latex' output, while HTML needs JPEG, GIF, or PNG formats. Doconce calls up programs from the ImageMagick suite for converting image files to a proper format if needed. The [<http://www.imagemagick.org/script/index.php> ImageMagick suite] can be installed on all major platforms. On Debian Linux (including Ubuntu) systems one can simply write

```
{{{
sudo apt-get install imagemagick
}}}
```

The convenience program 'doconce combine_images', for combining several images into one, will use 'montage' and 'convert' from ImageMagick and the 'pdftk', 'pdfnup', and 'pdfcrop' programs from the 'texlive-extra-utils' Debian package. The latter gets installed by

```
{{{
sudo apt-get install texlive-extra-utils
}}}
```

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==== Spellcheck ====

The utility `'doconce spellcheck'` applies the `'ispell'` program for spellcheck. On Debian (including Ubuntu) it is installed by

```
{
sudo apt-get install ispell
}
```

==== Ptex2tex for LaTeX Output ====

To make LaTeX documents with very flexible choice of typesetting of verbatim code blocks you need [<http://code.google.com/p/ptex2tex>], which is installed by

```
{
svn checkout http://ptex2tex.googlecode.com/svn/trunk/ ptex2tex
cd ptex2tex
sudo python setup.py install
}
```

It may happen that you need additional style files, you can run a script, `'cp2texmf.sh'`:

```
{
cd latex
sh cp2texmf.sh # copy stylefiles to ~/texmf directory
cd ../..
}
```

This script copies some special stylefiles that that `'ptex2tex'` potentially makes use of. Some more standard stylefiles are also needed. These are installed by

```
{
sudo apt-get install texlive-latex-recommended texlive-latex-extra
}
```

on Debian Linux (including Ubuntu) systems. TeXShop on Mac comes with the necessary stylefiles (if not, they can be found by googling and installed manually in the `'~/texmf/tex/latex/misc'` directory).

Note that the `'doconce ptex2tex'` command, which needs no installation beyond Doconce itself, can be used as a simpler alternative to the `'ptex2tex'` program.

The `*minted*` LaTeX style is offered by `'ptex2tex'` and `'doconce ptext2tex'` and popular among many users. This style requires the package [<http://pygments.org> Pygments] to be installed. On Debian Linux,

```
{
sudo apt-get install python-pygments
}
```

Alternatively, the package can be installed manually:

```
{
hg clone ssh://hg@bitbucket.org/birkenfeld/pygments-main pygments
cd pygments
sudo python setup.py install
}
```

If you use the `minted` style together with `'ptex2tex'`, you have to

”

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”

enable it by the `'-DMINTED'` command-line argument to `'ptex2tex'`. This is not necessary if you run the alternative `'doconce ptex2tex'` program.

All use of the minted style requires the `'-shell-escape'` command-line argument when running LaTeX, i.e., `'latex -shell-escape'` or `'pdflatex -shell-escape'`.

<wiki:comment> Say something about anslistings.sty </wiki:comment>

==== reStructuredText (reST) Output ====

The `'rst'` output from Doconce allows further transformation to LaTeX, HTML, XML, OpenOffice, and so on, through the [<http://docutils.sourceforge.net> docutils] package. The installation of the most recent version can be done by

```
{{{
svn checkout http://docutils.svn.sourceforge.net/svnroot/docutils/trunk/docutils
cd docutils
sudo python setup.py install
cd ..
}}}
```

To use the OpenOffice suite you will typically on Debian systems install

```
{{{
sudo apt-get install unovonv libreoffice libreoffice-dmaths
}}}
```

There is a possibility to create PDF files from reST documents using ReportLab instead of LaTeX. The enabling software is [<http://code.google.com/p/rst2pdf> rst2pdf]. Either download the tarball or clone the svn repository, go to the `'rst2pdf'` directory and run the usual `'sudo python setup.py install'`.

Output to `'sphinx'` requires of course the [<http://sphinx.pocoo.org> Sphinx software], installed by

```
{{{
hg clone https://bitbucket.org/birkenfeld/sphinx
cd sphinx
sudo python setup.py install
cd ..
}}}
```

==== Markdown and Pandoc Output ====

The Doconce format `'pandoc'` outputs the document in the Pandoc extended Markdown format, which via the `'pandoc'` program can be translated to a range of other formats. Installation of [<http://johnmacfarlane.net/pandoc/> Pandoc], written in Haskell, is most easily done by

```
{{{
sudo apt-get install pandoc
}}}
```

on Debian (Ubuntu) systems.

”

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”

==== Epydoc Output ====

When the output format is 'epydoc' one needs that program too, installed by

```
{ {{
svn co https://epydoc.svn.sourceforge.net/svnroot/epydoc/trunk/epydoc epydoc
cd epydoc
sudo make install
cd ..
}} }
```

Remark. Several of the packages above installed from source code are also available in Debian-based system through the 'apt-get install' command. However, we recommend installation directly from the version control system repository as there might be important updates and bug fixes. For 'svn' directories, go to the directory, run 'svn update', and then 'sudo python setup.py install'. For Mercurial ('hg') directories, go to the directory, run 'hg pull; hg update', and then 'sudo python setup.py install'.

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```
<!-- Missing: FIGURE, MOVIE, environments -->
```

```
% Doconce: Document Once, Include Anywhere
```

```
% Hans Petter Langtangen at Simula Research Laboratory and University of Oslo
```

```
% Jan 30, 2013
```

- * When writing a note, report, manual, etc., do you find it difficult to choose the typesetting format? That is, to choose between plain (email-like) text, wiki, Word/OpenOffice, LaTeX, HTML, reStructuredText, Sphinx, XML, etc. Would it be convenient to start with some very simple text-like format that easily converts to the formats listed above, and then at some later stage eventually go with a particular format?
- * Do you need to write documents in varying formats but find it difficult to remember all the typesetting details of various formats like [LaTeX](http://refcards.com/docs/silvermanj/amslatex/LaTeXRefCard.v2.0.pdf), [HTML](http://www.htmlcodetutorial.com/), [reStructuredText](http://docutils.sourceforge.net/docs/ref/rst/restructuredtext.html), [Sphinx](http://sphinx.pocoo.org/contents.html), and [wiki](http://code.google.com/p/support/wiki/WikiSyntax)? Would it be convenient to generate the typesetting details of a particular format from a very simple text-like format with minimal tagging?
- * Do you have the same information scattered around in different documents in different typesetting formats? Would it be a good idea to write things once, in one format, stored in one place, and include it anywhere?

If any of these questions are of interest, you should keep on reading.

What Does Doconce Look Like?

=====

Doconce text looks like ordinary text, but there are some almost invisible text constructions that allow you to control the formatting. Here are some examples.

- * Bullet lists arise from lines starting with `*`.
- * **Emphasized words** are surrounded by `*`.
- * Words in boldface are surrounded by underscores.
- * Words from computer code are enclosed in back quotes and then typeset `'verbatim (in a monospace font)'`.
- * Section headings are recognized by equality (`'='`) signs before and after the title, and the number of `'='` signs indicates the level of the section: 7 for main section, 5 for subsection, and 3 for subsubsection.
- * Paragraph headings are recognized by a double underscore before and after the heading.
- * The abstract of a document starts with **Abstract** as paragraph heading, and all text up to the next heading makes up the abstract,

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- * Blocks of computer code can easily be included by placing `'!bc'` (begin code) and `'!ec'` (end code) commands at separate lines before and after the code block.
- * Blocks of computer code can also be imported from source files.
- * Blocks of LaTeX mathematics can easily be included by placing `'!bt'` (begin TeX) and `'!et'` (end TeX) commands at separate lines before and after the math block.
- * There is support for both LaTeX and text-like inline mathematics.
- * Figures and movies with captions, simple tables, URLs with links, index list, labels and references are supported.
- * Invisible comments in the output format can be inserted throughout the text.
- * Visible comments can be inserted so that authors and readers can comment upon the text (and at any time turn on/off output of such comments).
- * There is an exercise environment with many advanced features.
- * With a preprocessor, Preprocess or Mako, one can include other documents (files) and large portions of text can be defined in or out of the text.
- * With Mako one can also have Python code embedded in the Doconce document and thereby parameterize the text (e.g., one text can describe programming in two languages).

Here is an example of some simple text written in the Doconce format:

```
~~~~~
===== A Subsection with Sample Text =====
\label{my:first:sec}
```

Ordinary text looks like ordinary text, and the tags used for `_boldface_` words, `*emphasized*` words, and `'computer'` words look natural in plain text. Lists are typeset as you would do in email,

- * item 1
- * item 2
- * item 3

Lists can also have automatically numbered items instead of bullets,

- o item 1
- o item 2
- o item 3

URLs with a link word are possible, as in `"hpl": "http://folk.uio.no/hpl"`. If the word is URL, the URL itself becomes the link name, as in `"URL": "tutorial.do.txt"`.

References to sections may use logical names as labels (e.g., a `"label"` command right after the section title), as in the reference to `Section ref{my:first:sec}`.

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Doconce also allows inline comments of the form [name: comment] (with a space after 'name:'), e.g., such as [hpl: here I will make some remarks to the text]. Inline comments can be removed from the output by a command-line argument (see Section `ref{doconce2formats}` for an example).

Tables are also supported, e.g.,

time	velocity	acceleration
0.0	1.4186	-5.01
2.0	1.376512	11.919
4.0	1.1E+1	14.717624

lines beginning with # are comment lines

The Doconce text above results in the following little document:

A Subsection with Sample Text

Ordinary text looks like ordinary text, and the tags used for `_boldface_` words, `*emphasized*` words, and `'computer'` words look natural in plain text. Lists are typeset as you would do in an email,

- * item 1
- * item 2
- * item 3

Lists can also have numbered items instead of bullets, just use an 'o' (for ordered) instead of the asterisk:

1. item 1
2. item 2
3. item 3

URLs with a link word are possible, as in [hpl](http://folk.uio.no/hpl). If the word is URL, the URL itself becomes the link name, as in `<tutorial.do.txt>`.

References to sections may use logical names as labels (e.g., a "label" command right after the section title), as in the reference to the section [A Subsection with Sample Text](#t).

Doconce also allows inline comments such as [hpl: here I will make some remarks to the text] for allowing authors to make notes. Inline comments can be removed from the output by a command-line argument (see the section [From Doconce to Other Formats](#s) for an example).

Tables are also supported, e.g.,

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time	velocity	acceleration
0.0	1.4186	-5.01
2.0	1.376512	11.919
4.0	1.1E+1	14.717624

Mathematics and Computer Code

Inline mathematics, such as $\nu = \sin(x)$, allows the formula to be specified both as LaTeX and as plain text. This results in a professional LaTeX typesetting, but in other formats the text version normally looks better than raw LaTeX mathematics with backslashes. An inline formula like $\nu = \sin(x)$ is typeset as

```
~~~~~
 $\nu = \sin(x)$  |  $\nu = \sin(x)$ 
~~~~~
```

The pipe symbol acts as a delimiter between LaTeX code and the plain text version of the formula. If you write a lot of mathematics, only the output formats 'latex', 'pdflatex', 'html', 'sphinx', and 'pandoc' are of interest and all these support inline LaTeX mathematics so then you will naturally drop the pipe symbol and write just

```
~~~~~
 $\nu = \sin(x)$ 
~~~~~
```

However, if you want more textual formats, like plain text or reStructuredText, the text after the pipe symbol may help to make the math formula more readable if there are backslashes or other special LaTeX symbols in the LaTeX code.

Blocks of mathematics are typeset with raw LaTeX, inside `!bt` and `!et` (begin TeX, end TeX) instructions:

```
~~~~~
!bt
\begin{align}
\{\partial u \over \partial t\} &= \nabla^2 u + f, \label{myeq1} \\
\{\partial v \over \partial t\} &= \nabla \cdot (q(u) \nabla v) + g
\end{align}
!et
~~~~~
```

<!-- Note: !bt and !et (and !bc and !ec below) are used to illustrate -->
<!-- tex and code blocks in inside verbatim blocks and are replaced -->
<!-- by !bt, !et, !bc, and !ec after all other formatting is finished. -->
The result looks like this:

```
$$
\begin{equation}
```

”

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”

```
{\partial u\over\partial t} = \nabla^2 u + f, \label{myeq1}
\end{equation}
$$
```

```
$$
\begin{equation}
{\partial v\over\partial t} = \nabla\cdot(q(u)\nabla v) + g
\end{equation}
$$
```

Of course, such blocks only looks nice in formats with support for LaTeX mathematics, and here the align environment in particular (this includes 'latex', 'pdflatex', 'html', and 'sphinx'). The raw LaTeX syntax appears in simpler formats, but can still be useful for those who can read LaTeX syntax.

You can have blocks of computer code, starting and ending with '!bc' and '!ec' instructions, respectively.

```
~~~~~
!bc pycod
from math import sin, pi
def myfunc(x):
    return sin(pi*x)

import integrate
I = integrate.trapezoidal(myfunc, 0, pi, 100)
!ec
~~~~~
```

Such blocks are formatted as

```
~~~~~{.Python}
from math import sin, pi
def myfunc(x):
    return sin(pi*x)

import integrate
I = integrate.trapezoidal(myfunc, 0, pi, 100)
~~~~~
```

A code block must come after some plain sentence (at least for successful output to 'sphinx', 'rst', and ASCII-close formats), not directly after a section/paragraph heading or a table.

One can also copy computer code directly from files, either the complete file or specified parts. Computer code is then never duplicated in the documentation (important for the principle of avoiding copying information!).

Another document can be included by writing '# #include "mynote.do.txt"' at the beginning of a line. Doconce documents have extension 'do.txt'. The 'do' part stands for doconce, while the trailing '.txt' denotes a text document so that editors gives you plain text editing capabilities.

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Macros (Newcommands), Cross-References, Index, and Bibliography

Doconce supports a type of macros via a LaTeX-style `*newcommand*` construction. The newcommands defined in a file with name `'newcommand_replace.tex'` are expanded when Doconce is filtered to other formats, except for LaTeX (since LaTeX performs the expansion itself). Newcommands in files with names `'newcommands.tex'` and `'newcommands_keep.tex'` are kept unaltered when Doconce text is filtered to other formats, except for the Sphinx format. Since Sphinx understands LaTeX math, but not newcommands if the Sphinx output is HTML, it makes most sense to expand all newcommands. Normally, a user will put all newcommands that appear in math blocks surrounded by `'!bt'` and `'!et'` in `'newcommands_keep.tex'` to keep them unchanged, at least if they contribute to make the raw LaTeX math text easier to read in the formats that cannot render LaTeX. Newcommands used elsewhere throughout the text will usually be placed in `'newcommands_replace.tex'` and expanded by Doconce. The definitions of newcommands in the `'newcommands*.tex'` files *must* appear on a single line (multi-line newcommands are too hard to parse with regular expressions).

Recent versions of Doconce also offer cross referencing, typically one can define labels below (sub)sections, in figure captions, or in equations, and then refer to these later. Entries in an index can be defined and result in an index at the end for the LaTeX and Sphinx formats. Citations to literature, with an accompanying bibliography in a file, are also supported. The syntax of labels, references, citations, and the bibliography closely resembles that of LaTeX, making it easy for Doconce documents to be integrated in LaTeX projects (manuals, books). For further details on functionality and syntax we refer to the `'doc/manual/manual.do.txt'` file (see the [demo page](<https://doconce.googlecode.com/hg/doc/demos/manual/index.html>) for various formats of this document).

<!-- Example on including another Doconce file (using preprocess): -->

From Doconce to Other Formats

=====

Transformation of a Doconce document `'mydoc.do.txt'` to various other formats applies the script `'doconce format'`:

```
~~~~~{.Bash}
Terminal> doconce format format mydoc.do.txt
~~~~~
```

or just

```
~~~~~{.Bash}
Terminal> doconce format format mydoc
~~~~~
```

Preprocessing

The `'preprocess'` and `'mako'` programs are used to preprocess the

”

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”

file, and options to 'preprocess' and/or 'mako' can be added after the filename. For example,

```
~~~~~{.Bash}
Terminal> doconce format latex mydoc -Dextra_sections -DVAR1=5      # preprocess
Terminal> doconce format latex yourdoc extra_sections=True VAR1=5  # mako
~~~~~
```

The variable 'FORMAT' is always defined as the current format when running 'preprocess' or 'mako'. That is, in the last example, 'FORMAT' is defined as 'latex'. Inside the Doconce document one can then perform format specific actions through tests like '#if FORMAT == "latex"' (for 'preprocess') or '% if FORMAT == "latex":' (for 'mako').

Removal of inline comments

```
<!-- mention notes also -->
```

The command-line arguments '--no-preprocess' and '--no-mako' turn off running 'preprocess' and 'mako', respectively.

Inline comments in the text are removed from the output by

```
~~~~~{.Bash}
Terminal> doconce format latex mydoc --skip_inline_comments
~~~~~
```

One can also remove all such comments from the original Doconce file by running:

```
~~~~~
Terminal> doconce remove_inline_comments mydoc
~~~~~
```

This action is convenient when a Doconce document reaches its final form and comments by different authors should be removed.

HTML

Making an HTML version of a Doconce file 'mydoc.do.txt' is performed by

```
~~~~~{.Bash}
Terminal> doconce format html mydoc
~~~~~
```

The resulting file 'mydoc.html' can be loaded into any web browser for viewing.

The HTML style can be defined either in the header of the HTML file or in an external CSS file. The latter is enabled by the command-line argument '--css=filename'. There is a default style with blue headings, and a style with the [solarized](<http://ethanschoonover.com/solarized>) color palette, specified by the '--html-solarized' command line argument. If there is no file with name 'filename' in the '--css=filename' specification, the blue or solarized styles are written to 'filename' and linked from the HTML document. You can provide your own style sheet

”

”

”

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either by replacing the content inside the `'style'` tags or by specifying a CSS file through the `'--css=filename'` option.

If the Pygments package (including the `'pygmentize'` program) is installed, code blocks are typeset with aid of this package. The command-line argument `'--no-pygments-html'` turns off the use of Pygments and makes code blocks appear with plain (`'pre'`) HTML tags. The option `'--pygments-html-linenos'` turns on line numbers in Pygments-formatted code blocks.

The HTML file can be embedded in a template if the Doconce document does not have a title (because then there will be no header and footer in the HTML file). The template file must contain valid HTML code and can have three "slots": `'%(title)s'` for a title, `'%(date)s'` for a date, and `'%(main)s'` for the main body of text, i.e., the Doconce document translated to HTML. The title becomes the first heading in the Doconce document, and the date is extracted from the `'DATE:'` line, if present. With the template feature one can easily embed the text in the look and feel of a website. The template can be extracted from the source code of a page at the site; just insert `'%(title)s'` and `'%(date)s'` at appropriate places and replace the main bod of text by `'%(main)s'`. Here is an example:

```
~~~~~{.Bash}
Terminal> doconce format html mydoc --html-template=mytemplate.html
~~~~~
```

Blogs

Doconce can be used for writing blogs provided the blog site accepts raw HTML code. Google's Blogger service (`'blogname.blogspot.com'`) is particularly well suited since it also allows extensive LaTeX mathematics via MathJax.

Write the blog text as a Doconce document without any title, author, and date. Then generate HTML as described above. Copy the text and paste it into the text area in the blog, making sure the input format is HTML.

On Google's Blogger service you can use Doconce to generate blogs with LaTeX mathematics and pretty (pygmentized) blocks of computer code. See a [blog example](<http://doconce.blogspot.no>) for details on blogging.

Warning. In the comments after the blog one cannot paste raw HTML code with MathJax scripts so there is no support for mathematics in the comments.

WordPress (`'wordpress.com'`) allows raw HTML code in blogs, but has very limited LaTeX support, basically only formulas. The `'--wordpress'` option to `'doconce'` modifies the HTML code such that all equations are typeset in a way that is acceptable to WordPress. There is a [doconce example](<http://doconce.wordpress.com>) on blogging with mathematics and code on WordPress.

Pandoc and Markdown

Output in Pandoc's extended Markdown format results from

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```
~~~~~{.Bash}
Terminal> doconce format pandoc mydoc
~~~~~
```

The name of the output file is ‘mydoc.mkd’.
From this format one can go to numerous other formats:

```
~~~~~{.Bash}
Terminal> pandoc -R -t mediawiki -o mydoc.mwk --toc mydoc.mkd
~~~~~
```

Pandoc supports ‘latex’, ‘html’, ‘odt’ (OpenOffice), ‘docx’ (Microsoft Word), ‘rtf’, ‘texinfo’, to mention some. The ‘-R’ option makes Pandoc pass raw HTML or LaTeX to the output format instead of ignoring it, while the ‘--toc’ option generates a table of contents. See the [Pandoc documentation](<http://johnmacfarlane.net/pandoc/README.html>) for the many features of the ‘pandoc’ program.

Pandoc is useful to go from LaTeX mathematics to, e.g., HTML or MS Word. There are two ways (experiment to find the best one for your document): ‘doconce format pandoc’ and then translating using ‘pandoc’, or ‘doconce format latex’, and then going from LaTeX to the desired format using ‘pandoc’.

Here is an example on the latter strategy:

```
~~~~~{.Bash}
Terminal> doconce format latex mydoc
Terminal> doconce ptex2tex mydoc
Terminal> doconce replace '\Verb!' '\verb!' mydoc.tex
Terminal> pandoc -f latex -t docx -o mydoc.docx mydoc.tex
~~~~~
```

When we go through ‘pandoc’, only single equations or ‘align*’ environments are well understood.

Note that Doconce applies the ‘Verb’ macro from the ‘fancyvrb’ package while ‘pandoc’ only supports the standard ‘verb’ construction for inline verbatim text. Moreover, quite some additional ‘doconce replace’ and ‘doconce subst’ edits might be needed on the ‘.mkd’ or ‘.tex’ files to successfully have mathematics that is well translated to MS Word. Also when going to reStructuredText using Pandoc, it can be advantageous to go via LaTeX.

Here is an example where we take a Doconce snippet (without title, author, and date), maybe with some unnumbered equations, and quickly generate HTML with mathematics displayed by MathJax:

```
~~~~~{.Bash}
Terminal> doconce format pandoc mydoc
Terminal> pandoc -t html -o mydoc.html -s --mathjax mydoc.mkd
~~~~~
```

The ‘-s’ option adds a proper header and footer to the ‘mydoc.html’ file. This recipe is a quick way of making HTML notes with (some) mathematics.

LaTeX

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Making a LaTeX file ‘mydoc.tex’ from ‘mydoc.do.txt’ is done in two steps:

<!-- Note: putting code blocks inside a list is not successful in many -->

<!-- formats – the text may be messed up. A better choice is a paragraph -->

<!-- environment, as used here. -->

Step 1. Filter the doconce text to a pre-LaTeX form ‘mydoc.p.tex’ for the ‘ptex2tex’ program (or ‘doconce ptex2tex’):

```
~~~~~{.Bash}
Terminal> doconce format latex mydoc
~~~~~
```

LaTeX-specific commands ("newcommands") in math formulas and similar

can be placed in files ‘newcommands.tex’, ‘newcommands_keep.tex’, or

‘newcommands_replace.tex’ (see the section [Macros (Newcommands), Cross-References, Index, and Bibliography](#y)).

If these files are present, they are included in the LaTeX document so that your commands are defined.

An option ‘--latex-printed’ makes some adjustments for documents aimed at being printed. For example, links to web resources are associated with a footnote listing the complete web address (URL).

Step 2. Run ‘ptex2tex’ (if you have it) to make a standard LaTeX file,

```
~~~~~{.Bash}
Terminal> ptex2tex mydoc
~~~~~
```

In case you do not have ‘ptex2tex’, you may run a (very) simplified version:

```
~~~~~{.Bash}
Terminal> doconce ptex2tex mydoc
~~~~~
```

Note that Doconce generates a ‘.p.tex’ file with some preprocessor macros that can be used to steer certain properties of the LaTeX document.

For example, to turn on the Helvetica font instead of the standard Computer Modern font, run

```
~~~~~{.Bash}
Terminal> ptex2tex -DHELIVETICA mydoc
Terminal> doconce ptex2tex mydoc -DHELIVETICA # alternative
~~~~~
```

The title, authors, and date are by default typeset in a non-standard way to enable a nicer treatment of multiple authors having institutions in common. However, the standard LaTeX "maketitle" heading is also available through ‘-DLATEX_HEADING=traditional’.

A separate titlepage can be generate by ‘-DLATEX_HEADING=titlepage’.

Preprocessor variables to be defined or undefined are

- * ‘BOOK’ for the "book" documentclass rather than the standard "article" class (necessary if you apply chapter headings)

- * ‘PALATINO’ for the Palatino font

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- * ‘**HELVETIA**’ for the Helvetica font
- * ‘**A4PAPER**’ for A4 paper size
- * ‘**A6PAPER**’ for A6 paper size (suitable for reading on small devices)
- * ‘**MOVIE15**’ for using the movie15 LaTeX package to display movies
- * ‘**PREAMBLE**’ to turn the LaTeX preamble on or off (i.e., complete document or document to be included elsewhere)
- * ‘**MINTED**’ for inclusion of the minted package (which requires ‘**latex**’ or ‘**pdflatex**’ to be run with the ‘**–shell–escape**’ option)

The ‘**ptex2tex**’ tool makes it possible to easily switch between many different fancy formattings of computer or verbatim code in LaTeX documents. After any ‘**!bc**’ command in the Doconce source you can insert verbatim block styles as defined in your ‘**.ptex2tex.cfg**’ file, e.g., ‘**!bc sys**’ for a terminal session, where ‘**sys**’ is set to a certain environment in ‘**.ptex2tex.cfg**’ (e.g., ‘**CodeTerminal**’). There are about 40 styles to choose from, and you can easily add new ones.

Also the ‘**doconce ptex2tex**’ command supports preprocessor directives for processing the ‘**.p.tex**’ file. The command allows specifications of code environments as well. Here is an example:

```
~~~~~{.Bash}
Terminal> doconce ptex2tex mydoc -DLATEX_HEADING=traditional \
-DPALATINO -DA6PAPER \
"sys=\begin{quote}\begin{verbatim}@\\end{verbatim}\\end{quote}" \
fpro=minted fcod=minted shcod=Verbatim envr=ans:nt
~~~~~
```

Note that ‘**@**’ must be used to separate the begin and end LaTeX commands, unless only the environment name is given (such as ‘**minted**’ above, which implies ‘**\begin{minted}{fortran}**’ and ‘**\end{minted}**’ as begin and end for blocks inside ‘**!bc fpro**’ and ‘**!ec**’). Specifying ‘**envr=ans:nt**’ means that all other environments are typeset with the ‘**anslistings.sty**’ package, e.g., ‘**!bc cppcod**’ will then result in ‘**\begin{c++}**’. If no environments like ‘**sys**’, ‘**fpro**’, or the common ‘**envr**’ are defined on the command line, the plain ‘**\begin{verbatim}**’ and ‘**\end{verbatim}**’ used.

*Step 2b (optional). * Edit the ‘**mydoc.tex**’ file to your needs. For example, you may want to substitute ‘**section**’ by ‘**section***’ to avoid numbering of sections, you may want to insert linebreaks (and perhaps space) in the title, etc. This can be automatically edited with the aid of the ‘**doconce replace**’ and ‘**doconce subst**’ commands. The former works with substituting text directly, while the latter performs substitutions using regular expressions. Here are two examples:

```
~~~~~{.Bash}
Terminal> doconce replace 'section{' 'section*{' mydoc.tex
Terminal> doconce subst 'title\{(.+)Using (.+)\}' \
'title{\g<1> \\\ [1.5mm] Using \g<2>}' mydoc.tex
```

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A lot of tailored fixes to the LaTeX document can be done by an appropriate set of text replacements and regular expression substitutions. You are anyway encouraged to make a script for generating PDF from the LaTeX file.

Step 3. Compile ‘mydoc.tex’ and create the PDF file:

```
~~~~~{.Bash}
Terminal> latex mydoc
Terminal> latex mydoc
Terminal> makeindex mydoc # if index
Terminal> bibitem mydoc # if bibliography
Terminal> latex mydoc
Terminal> dvipdf mydoc
~~~~~
```

If one wishes to run ‘ptex2tex’ and use the minted LaTeX package for typesetting code blocks (‘Minted_Python’, ‘Minted_Cpp’, etc., in ‘ptex2tex’ specified through the ‘*pro’ and ‘*cod’ variables in ‘.ptex2tex.cfg’ or ‘\$HOME/.ptex2tex.cfg’), the minted LaTeX package is needed. This package is included by running ‘ptex2tex’ with the ‘-DMINTED’ option:

```
~~~~~{.Bash}
Terminal> ptex2tex -DMINTED mydoc
~~~~~
```

In this case, ‘latex’ must be run with the ‘-shell-escape’ option:

```
~~~~~{.Bash}
Terminal> latex -shell-escape mydoc
Terminal> latex -shell-escape mydoc
Terminal> makeindex mydoc # if index
Terminal> bibitem mydoc # if bibliography
Terminal> latex -shell-escape mydoc
Terminal> dvipdf mydoc
~~~~~
```

When running ‘doconce ptex2tex mydoc envir=minted’ (or other minted specifications with ‘doconce ptex2tex’), the minted package is automatically included so there is no need for the ‘-DMINTED’ option.

PDFLaTeX

Running ‘pdflatex’ instead of ‘latex’ follows almost the same steps, but the start is

```
~~~~~{.Bash}
Terminal> doconce format latex mydoc
~~~~~
```

Then ‘ptex2tex’ is run as explained above, and finally

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```
~~~~~{.Bash}
Terminal> pdflatex -shell-escape mydoc
Terminal> makeindex mydoc # if index
Terminal> bibitem mydoc # if bibliography
Terminal> pdflatex -shell-escape mydoc
~~~~~
```

Plain ASCII Text

We can go from Doconce "back to" plain untagged text suitable for viewing in terminal windows, inclusion in email text, or for insertion in computer source code:

```
~~~~~{.Bash}
Terminal> doconce format plain mydoc.do.txt # results in mydoc.txt
~~~~~
```

reStructuredText

Going from Doconce to reStructuredText gives a lot of possibilities to go to other formats. First we filter the Doconce text to a reStructuredText file 'mydoc.rst':

```
~~~~~{.Bash}
Terminal> doconce format rst mydoc.do.txt
~~~~~
```

We may now produce various other formats:

```
~~~~~{.Bash}
Terminal> rst2html.py mydoc.rst > mydoc.html # html
Terminal> rst2latex.py mydoc.rst > mydoc.tex # latex
Terminal> rst2xml.py mydoc.rst > mydoc.xml # XML
Terminal> rst2odt.py mydoc.rst > mydoc.odt # OpenOffice
~~~~~
```

The OpenOffice file 'mydoc.odt' can be loaded into OpenOffice and saved in, among other things, the RTF format or the Microsoft Word format. However, it is more convenient to use the program 'unoconv' to convert between the many formats OpenOffice supports *on the command line*. Run

```
~~~~~{.Bash}
Terminal> unoconv --show
~~~~~
```

to see all the formats that are supported. For example, the following commands take 'mydoc.odt' to Microsoft Office Open XML format, classic MS Word format, and PDF:

```
~~~~~{.Bash}
Terminal> unoconv -f ooxml mydoc.odt
Terminal> unoconv -f doc mydoc.odt
Terminal> unoconv -f pdf mydoc.odt
~~~~~
```

”

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”

Remark about Mathematical Typesetting. At the time of this writing, there is no easy way to go from Doconce and LaTeX mathematics to reST and further to OpenOffice and the "MS Word world". Mathematics is only fully supported by 'latex' as output and to a wide extent also supported by the 'sphinx' output format. Some links for going from LaTeX to Word are listed below.

* <<http://ubuntuforums.org/showthread.php?t=1033441>>

* <<http://tug.org/utilities/texconv/textopc.html>>

* <<http://nileshbansal.blogspot.com/2007/12/latex-to-openofficeword.html>>

Sphinx

Sphinx documents demand quite some steps in their creation. We have automated most of the steps through the 'doconce sphinx_dir' command:

```
~~~~~{.Bash}
Terminal> doconce sphinx_dir author="authors ' names " \
          title="some title" version=1.0 dirname=sphinxdir \
          theme=mytheme file1 file2 file3 ...
~~~~~
```

The keywords 'author', 'title', and 'version' are used in the headings of the Sphinx document. By default, 'version' is 1.0 and the script will try to deduce authors and title from the doconce files 'file1', 'file2', etc. that together represent the whole document. Note that none of the individual Doconce files 'file1', 'file2', etc. should include the rest as their union makes up the whole document. The default value of 'dirname' is 'sphinx-rootdir'. The 'theme' keyword is used to set the theme for design of HTML output from Sphinx (the default theme is 'default').

With a single-file document in 'mydoc.do.txt' one often just runs

```
~~~~~{.Bash}
Terminal> doconce sphinx_dir mydoc
~~~~~
```

and then an appropriate Sphinx directory 'sphinx-rootdir' is made with relevant files.

The 'doconce sphinx_dir' command generates a script 'automake_sphinx.py' for compiling the Sphinx document into an HTML document. One can either run 'automake_sphinx.py' or perform the steps in the script manually, possibly with necessary modifications. You should at least read the script prior to executing it to have some idea of what is done.

The 'doconce sphinx_dir' script copies directories named 'figs' or 'figures' over to the Sphinx directory so that figures are accessible in the Sphinx compilation. If figures or movies are located in other directories, 'automake_sphinx.py' must be edited accordingly. Files, to which there are local links (not 'http:' or 'file:' URLs), must be placed in the '_static' subdirectory of the Sphinx directory. The utility 'doconce sphinxfix_localURLs' is run to check for local links in the Doconce file: for each such link, say 'dir1/dir2/myfile.txt' it replaces the link by '_static/myfile.txt' and copies

”

”

”

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‘dir1/dir2/myfile.txt’ to a local ‘_static’ directory (in the same directory as the script is run). However, we recommend instead that the writer of the document places files in ‘_static’ or lets a script do it automatically. The user must copy all ‘_static/*’ files to the ‘_static’ subdirectory of the Sphinx directory. It may be wise to always put files, to which there are local links in the Doconce document, in a ‘_static’ or ‘_static-name’ directory and use these local links. Then links do not need to be modified when creating a Sphinx version of the document.

Doconce comes with a collection of HTML themes for Sphinx documents. These are packed out in the Sphinx directory, the ‘conf.py’ configuration file for Sphinx is edited accordingly, and a script ‘make-themes.sh’ can make HTML documents with one or more themes. For example, to realize the themes ‘fenics’ and ‘pyramid’, one writes

```
~~~~~{.Bash}
Terminal> ./make-themes.sh fenics pyramid
~~~~~
```

The resulting directories with HTML documents are ‘_build/html_fenics’ and ‘_build/html_pyramid’, respectively. Without arguments, ‘make-themes.sh’ makes all available themes (!).

If it is not desirable to use the autogenerated scripts explained above, here is the complete manual procedure of generating a Sphinx document from a file ‘mydoc.do.txt’.

Step 1. Translate Doconce into the Sphinx format:

```
~~~~~{.Bash}
Terminal> doconce format sphinx mydoc
~~~~~
```

Step 2. Create a Sphinx root directory either manually or by using the interactive ‘sphinx-quickstart’ program. Here is a scripted version of the steps with the latter:

```
~~~~~{.Bash}
mkdir sphinx-rootdir
sphinx-quickstart <<EOF
sphinx-rootdir
n
```

~Name of My Sphinx Document

Author

version

version

.rst

index

n

y

n

n

n

n

y

n

”

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”

n
y
y
y
EOF

~~~~~

The autogenerated ‘conf.py’ file may need some edits if you want to specific layout (Sphinx themes) of HTML pages. The ‘doconce sphinx\_dir’ generator makes an extended ‘conv.py’ file where, among other things, several useful Sphinx extensions are included.

\*Step 3.\* Copy the ‘mydoc.rst’ file to the Sphinx root directory:

~~~~~{.Bash}  
Terminal> cp mydoc.rst sphinx-rootdir
~~~~~

If you have figures in your document, the relative paths to those will be invalid when you work with ‘mydoc.rst’ in the ‘sphinx-rootdir’ directory. Either edit ‘mydoc.rst’ so that figure file paths are correct, or simply copy your figure directories to ‘sphinx-rootdir’. Links to local files in ‘mydoc.rst’ must be modified to links to files in the ‘\_static’ directory, see comment above.

\*Step 4.\* Edit the generated ‘index.rst’ file so that ‘mydoc.rst’ is included, i.e., add ‘mydoc’ to the ‘toctree’ section so that it becomes

~~~~~  
.. toctree::
 :maxdepth: 2

 mydoc
~~~~~

(The spaces before ‘mydoc’ are important!)

\*Step 5.\* Generate, for instance, an HTML version of the Sphinx source:

~~~~~{.Bash}  
make clean # remove old versions
make html
~~~~~

Sphinx can generate a range of different formats: standalone HTML, HTML in separate directories with ‘index.html’ files, a large single HTML file, JSON files, various help files (the qthelp, HTML, and Devhelp projects), epub, LaTeX, PDF (via LaTeX), pure text, man pages, and Texinfo files.

\*Step 6.\* View the result:

~~~~~{.Bash}  
Terminal> firefox _build/html/index.html
~~~~~

Note that verbatim code blocks can be typeset in a variety of ways



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depending the argument that follows `!bc`: `cod` gives Python (`code-block:: python` in Sphinx syntax) and `cppcod` gives C++, but all such arguments can be customized both for Sphinx and LaTeX output.

### Wiki Formats

---

There are many different wiki formats, but Doconce only supports three: [Googlecode wiki](http://code.google.com/p/support/wiki/WikiSyntax), [MediaWiki](http://www.mediawiki.org/wiki/Help:Formatting), and [Creole Wiki](http://www.wikicreole.org/wiki/Creole1.0).

These formats are called

`gwiki`, `mwiki`, and `cwiki`, respectively.

Transformation from Doconce to these formats is done by

```
~~~~~{.Bash}
Terminal> doconce format gwiki mydoc.do.txt
Terminal> doconce format mwiki mydoc.do.txt
Terminal> doconce format cwiki mydoc.do.txt
~~~~~
```

The produced MediaWiki can be tested in the [sandbox of wikibooks.org](http://en.wikibooks.org/wiki/Sandbox). The format works well with Wikipedia, Wikibooks, and [ShoutWiki](http://doconcedemo.shoutwiki.com/wiki/Doconce\_demo\_page), but not always well elsewhere (see [this example](http://doconcedemo.jumpwiki.com/wiki/First\_demo)).

Large MediaWiki documents can be made with the [Book creator](http://en.wikipedia.org/w/index.php?title=Special:Book&bookcmd=book\_creator). From the MediaWiki format one can go to other formats with aid of [mwlib](http://pediapress.com/code/). This means that one can easily use Doconce to write [Wikibooks](http://en.wikibooks.org) and publish these in PDF and MediaWiki format, while at the same time, the book can also be published as a standard LaTeX book, a Sphinx web document, or a collection of HTML files.

The Googlecode wiki document, `mydoc.gwiki`, is most conveniently stored in a directory which is a clone of the wiki part of the Googlecode project. This is far easier than copying and pasting the entire text into the wiki editor in a web browser.

When the Doconce file contains figures, each figure filename must in the `.gwiki` file be replaced by a URL where the figure is available. There are instructions in the file for doing this. Usually, one performs this substitution automatically (see next section).

### Tweaking the Doconce Output

---

Occasionally, one would like to tweak the output in a certain format from Doconce. One example is figure filenames when transforming Doconce to reStructuredText. Since Doconce does not know if the `.rst` file is going to be filtered to LaTeX or HTML, it cannot know if `.eps` or `.png` is the most appropriate image filename. The solution is to use a text substitution command or code with, e.g., `sed`,

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perl, python, or scitools subst, to automatically edit the output file from Doconce. It is then wise to run Doconce and the editing commands from a script to automate all steps in going from Doconce to the final format(s). The ‘make.sh’ files in ‘docs/manual’ and ‘docs/tutorial’ constitute comprehensive examples on how such scripts can be made.

### Demos

The current text is generated from a Doconce format stored in the file

```
docs/tutorial/tutorial.do.txt
```

The file ‘make.sh’ in the ‘tutorial’ directory of the Doconce source code contains a demo of how to produce a variety of formats. The source of this tutorial, ‘tutorial.do.txt’ is the starting point. Running ‘make.sh’ and studying the various generated files and comparing them with the original ‘tutorial.do.txt’ file, gives a quick introduction to how Doconce is used in a real case. [Here](<https://doconce.googlecode.com/hg/doc/demos/tutorial/index.html>) is a sample of how this tutorial looks in different formats.

There is another demo in the ‘docs/manual’ directory which translates the more comprehensive documentation, ‘manual.do.txt’, to various formats. The ‘make.sh’ script runs a set of translations.

### Installation of Doconce and its Dependencies

#### Doconce

Doconce itself is pure Python code hosted at <<http://code.google.com/p/doconce/>>. Its installation from the Mercurial (‘hg’) source follows the standard procedure:

```
~~~~~{.Bash}
Doconce
hg clone https://code.google.com/p/doconce/ doconce
cd doconce
sudo python setup.py install
cd ..
~~~~~
```

Since Doconce is frequently updated, it is recommended to use the above procedure and whenever a problem occurs, make sure to update to the most recent version:

```
~~~~~{.Bash}
cd doconce
hg pull
hg update
sudo python setup.py install
~~~~~
```

Debian GNU/Linux users can also run

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```
~~~~~{.Bash}
sudo apt-get install doconce
~~~~~
```

This installs the latest release and not the most updated and bugfixed version.

On Ubuntu one needs to run

```
~~~~~{.Bash}
sudo add-apt-repository ppa:scitools/ppa
sudo apt-get update
sudo apt-get install doconce
~~~~~
```

### Dependencies

---

### Preprocessors

---

If you make use of the [Preprocess](<http://code.google.com/p/preprocess>) preprocessor, this program must be installed:

```
~~~~~{.Bash}
svn checkout http://preprocess.googlecode.com/svn/trunk/ preprocess
cd preprocess
cd doconce
sudo python setup.py install
cd ..
~~~~~
```

A much more advanced alternative to Preprocess is [Mako](<http://www.makotemplates.org>). Its installation is most conveniently done by ‘pip’,

```
~~~~~{.Bash}
pip install Mako
~~~~~
```

This command requires ‘pip’ to be installed. On Debian Linux systems, such as Ubuntu, the installation is simply done by

```
~~~~~{.Bash}
sudo apt-get install python-pip
~~~~~
```

Alternatively, one can install from the ‘pip’ [source code](<http://pypi.python.org/pypi/pip>).

Mako can also be installed directly from [source](<http://www.makotemplates.org/download.html>): download the tarball, pack it out, go to the directory and run the usual ‘sudo python setup.py install’.

### Image file handling

---

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Different output formats require different formats of image files.

For example, PostScript or Encapsulated PostScript is required for ‘latex’ output, while HTML needs JPEG, GIF, or PNG formats.

Doconce calls up programs from the ImageMagick suite for converting image files to a proper format if needed. The [ImageMagick suite](<http://www.imagemagick.org/script/index.php>) can be installed on all major platforms.

On Debian Linux (including Ubuntu) systems one can simply write

```
~~~~~{.Bash}
sudo apt-get install imagemagick
~~~~~
```

The convenience program ‘doconce combine\_images’, for combining several images into one, will use ‘montage’ and ‘convert’ from ImageMagick and the ‘pdftk’, ‘pdfnup’, and ‘pdfcrop’ programs from the ‘texlive-extra-utils’ Debian package. The latter gets installed by

```
~~~~~{.Bash}
sudo apt-get install texlive-extra-utils
~~~~~
```

### Spellcheck

The utility ‘doconce spellcheck’ applies the ‘ispell’ program for spellcheck. On Debian (including Ubuntu) it is installed by

```
~~~~~{.Bash}
sudo apt-get install ispell
~~~~~
```

### Ptex2tex for LaTeX Output

To make LaTeX documents with very flexible choice of typesetting of verbatim code blocks you need [ptex2tex](<http://code.google.com/p/ptex2tex>), which is installed by

```
~~~~~{.Bash}
svn checkout http://ptex2tex.googlecode.com/svn/trunk/ ptex2tex
cd ptex2tex
sudo python setup.py install
~~~~~
```

It may happen that you need additional style files, you can run a script, ‘cp2texmf.sh’:

```
~~~~~{.Bash}
cd latex
sh cp2texmf.sh # copy stylefiles to ~/texmf directory
cd ../..
~~~~~
```

This script copies some special stylefiles that

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that ‘ptex2tex’ potentially makes use of. Some more standard stylefiles are also needed. These are installed by

```
~~~~~{.Bash}
sudo apt-get install texlive-latex-recommended texlive-latex-extra
~~~~~
```

on Debian Linux (including Ubuntu) systems. TeXShop on Mac comes with the necessary stylefiles (if not, they can be found by googling and installed manually in the ‘~/texmf/tex/latex/misc’ directory).

Note that the ‘doconce ptex2tex’ command, which needs no installation beyond Doconce itself, can be used as a simpler alternative to the ‘ptex2tex’ program.

The \*minted\* LaTeX style is offered by ‘ptex2tex’ and ‘doconce ptext2tex’ and popular among many users. This style requires the package [Pygments](http://pygments.org) to be installed. On Debian Linux,

```
~~~~~{.Bash}
sudo apt-get install python-pygments
~~~~~
```

Alternatively, the package can be installed manually:

```
~~~~~{.Bash}
hg clone ssh://hg@bitbucket.org/birkenfeld/pygments-main pygments
cd pygments
sudo python setup.py install
~~~~~
```

If you use the minted style together with ‘ptex2tex’, you have to enable it by the ‘-DMINTED’ command-line argument to ‘ptex2tex’. This is not necessary if you run the alternative ‘doconce ptex2tex’ program.

All use of the minted style requires the ‘-shell-escape’ command-line argument when running LaTeX, i.e., ‘latex -shell-escape’ or ‘pdflatex -shell-escape’.

<!-- Say something about anslistings.sty -->

reStructuredText (reST) Output

The ‘rst’ output from Doconce allows further transformation to LaTeX, HTML, XML, OpenOffice, and so on, through the [docutils](http://docutils.sourceforge.net) package. The installation of the most recent version can be done by

```
~~~~~{.Bash}
svn checkout http://docutils.svn.sourceforge.net/svnroot/docutils/trunk/docutils
cd docutils
sudo python setup.py install
cd ..
~~~~~
```

## tutorial.md

To use the OpenOffice suite you will typically on Debian systems install

```
~~~~~{.Bash}
sudo apt-get install unovonv libreoffice libreoffice-dmaths
~~~~~
```

There is a possibility to create PDF files from reST documents using ReportLab instead of LaTeX. The enabling software is [rst2pdf](<http://code.google.com/p/rst2pdf>). Either download the tarball or clone the svn repository, go to the 'rst2pdf' directory and run the usual 'sudo python setup.py install'.

Output to 'sphinx' requires of course the [Sphinx software](<http://sphinx.pocoo.org>), installed by

```
~~~~~{.Bash}
hg clone https://bitbucket.org/irkenfeld/sphinx
cd sphinx
sudo python setup.py install
cd ..
~~~~~
```

### Markdown and Pandoc Output

The Doconce format 'pandoc' outputs the document in the Pandoc extended Markdown format, which via the 'pandoc' program can be translated to a range of other formats. Installation of [Pandoc](<http://johnmacfarlane.net/pandoc/>), written in Haskell, is most easily done by

```
~~~~~{.Bash}
sudo apt-get install pandoc
~~~~~
```

on Debian (Ubuntu) systems.

### Epydoc Output

When the output format is 'epydok' one needs that program too, installed by

```
~~~~~{.Bash}
svn co https://epydok.svn.sourceforge.net/svnroot/epydok/trunk/epydok epydok
cd epydok
sudo make install
cd ..
~~~~~
```

\*Remark.\* Several of the packages above installed from source code are also available in Debian-based system through the 'apt-get install' command. However, we recommend installation directly from the version control system repository as there might be important

”

**tutorial.md**

”

updates and bug fixes. For ‘svn’ directories, go to the directory, run ‘svn update’, and then ‘sudo python setup.py install’. For Mercurial (‘hg’) directories, go to the directory, run ‘hg pull; hg update’, and then ‘sudo python setup.py install’.

---

# **Doconce: Document Once, Include Anywhere Documentation**

***Release 1.0***

**Hans Petter Langtangen**

January 30, 2013





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Contents:



# DOCONCE: DOCUMENT ONCE, INCLUDE ANYWHERE

**Author** Hans Petter Langtangen

**Date** Jan 30, 2013

- When writing a note, report, manual, etc., do you find it difficult to choose the typesetting format? That is, to choose between plain (email-like) text, wiki, Word/OpenOffice, LaTeX, HTML, reStructuredText, Sphinx, XML, etc. Would it be convenient to start with some very simple text-like format that easily converts to the formats listed above, and then at some later stage eventually go with a particular format?
- Do you need to write documents in varying formats but find it difficult to remember all the typesetting details of various formats like LaTeX, HTML, reStructuredText, Sphinx, and wiki? Would it be convenient to generate the typesetting details of a particular format from a very simple text-like format with minimal tagging?
- Do you have the same information scattered around in different documents in different typesetting formats? Would it be a good idea to write things once, in one format, stored in one place, and include it anywhere?

If any of these questions are of interest, you should keep on reading.



# WHAT DOES DOCONCE LOOK LIKE?

Doconce text looks like ordinary text, but there are some almost invisible text constructions that allow you to control the formatting. Here are some examples.

- Bullet lists arise from lines starting with `*`.
- *Emphasized words* are surrounded by `*`.
- **Words in boldface** are surrounded by underscores.
- Words from computer code are enclosed in back quotes and then typeset `verbatim` (in a monospace font).
- Section headings are recognized by equality (`=`) signs before and after the title, and the number of `=` signs indicates the level of the section: 7 for main section, 5 for subsection, and 3 for subsubsection.
- Paragraph headings are recognized by a double underscore before and after the heading.
- The abstract of a document starts with *Abstract* as paragraph heading, and all text up to the next heading makes up the abstract.
- Blocks of computer code can easily be included by placing `!bc` (begin code) and `!ec` (end code) commands at separate lines before and after the code block.
- Blocks of computer code can also be imported from source files.
- Blocks of LaTeX mathematics can easily be included by placing `!bt` (begin TeX) and `!et` (end TeX) commands at separate lines before and after the math block.
- There is support for both LaTeX and text-like inline mathematics.
- Figures and movies with captions, simple tables, URLs with links, index list, labels and references are supported.
- Invisible comments in the output format can be inserted throughout the text.
- Visible comments can be inserted so that authors and readers can comment upon the text (and at any time turn on/off output of such comments).
- There is an exercise environment with many advanced features.
- With a preprocessor, Preprocess or Mako, one can include other documents (files) and large portions of text can be defined in or out of the text.
- With Mako one can also have Python code embedded in the Doconce document and thereby parameterize the text (e.g., one text can describe programming in two languages).

Here is an example of some simple text written in the Doconce format:



```
==== A Subsection with Sample Text ====
label{my:first:sec}
```

Ordinary text looks like ordinary text, and the tags used for `_boldface_` words, `*emphasized*` words, and `'computer'` words look natural in plain text. Lists are typeset as you would do in email,

- \* item 1
- \* item 2
- \* item 3

Lists can also have automatically numbered items instead of bullets,

- o item 1
- o item 2
- o item 3

URLs with a link word are possible, as in `"hpl": "http://folk.uio.no/hpl"`. If the word is URL, the URL itself becomes the link name, as in `"URL": "tutorial.do.txt"`.

References to sections may use logical names as labels (e.g., a `"label"` command right after the section title), as in the reference to Section `ref{my:first:sec}`.

Doconce also allows inline comments of the form `[name: comment]` (with a space after `'name:'`), e.g., such as `[hpl: here I will make some remarks to the text]`. Inline comments can be removed from the output by a command-line argument (see Section `ref{doconce2formats}` for an example).

Tables are also supported, e.g.,

```
|-----|
|time  | velocity | acceleration |
|---r-----r-----r-----|
| 0.0  | 1.4186   | -5.01        |
| 2.0  | 1.376512 | 11.919       |
| 4.0  | 1.1E+1   | 14.717624    |
|-----|
```

# lines beginning with # are comment lines

The Doconce text above results in the following little document:

## 2.1 A Subsection with Sample Text

Ordinary text looks like ordinary text, and the tags used for **boldface** words, *emphasized* words, and `computer` words look natural in plain text. Lists are typeset as you would do in an email,

- item 1
- item 2
- item 3

Lists can also have numbered items instead of bullets, just use an `o` (for ordered) instead of the asterisk:

1. item 1
2. item 2
3. item 3

URLs with a link word are possible, as in [hpl](#). If the word is URL, the URL itself becomes the link name, as in [tutorial.do.txt](#).

References to sections may use logical names as labels (e.g., a “label” command right after the section title), as in the reference to the section [A Subsection with Sample Text](#).

Doconce also allows inline comments such as (**hpl**: here I will make some remarks to the text) for allowing authors to make notes. Inline comments can be removed from the output by a command-line argument (see the section [From Doconce to Other Formats](#) for an example).

Tables are also supported, e.g.,

time	velocity	acceleration
0.0	1.4186	-5.01
2.0	1.376512	11.919
4.0	1.1E+1	14.717624

## 2.2 Mathematics and Computer Code

Inline mathematics, such as  $\nu = \sin(x)$ , allows the formula to be specified both as LaTeX and as plain text. This results in a professional LaTeX typesetting, but in other formats the text version normally looks better than raw LaTeX mathematics with backslashes. An inline formula like  $\nu = \sin(x)$  is typeset as

```
$\nu = \sin(x)$ | $v = \sin(x)$
```

The pipe symbol acts as a delimiter between LaTeX code and the plain text version of the formula. If you write a lot of mathematics, only the output formats `latex`, `pdflatex`, `html`, `sphinx`, and `pandoc` are of interest and all these support inline LaTeX mathematics so then you will naturally drop the pipe symbol and write just

```
$\nu = \sin(x)$
```

However, if you want more textual formats, like plain text or reStructuredText, the text after the pipe symbol may help to make the math formula more readable if there are backslashes or other special LaTeX symbols in the LaTeX code.

Blocks of mathematics are typeset with raw LaTeX, inside `!bt` and `!et` (begin TeX, end TeX) instructions:

```
!bt
\begin{align}
{\partial u \over \partial t} &= \nabla^2 u + f, \text{label{myeq1}} \\
{\partial v \over \partial t} &= \nabla \cdot (q(u) \nabla v) + g
\end{align}
!et
```

The result looks like this:

$$\frac{\partial u}{\partial t} = \nabla^2 u + f, \tag{2.1}$$

$$\frac{\partial v}{\partial t} = \nabla \cdot (q(u) \nabla v) + g$$

Of course, such blocks only looks nice in formats with support for LaTeX mathematics, and here the align environment in particular (this includes `latex`, `pdflatex`, `html`, and `sphinx`). The raw LaTeX syntax appears in simpler formats, but can still be useful for those who can read LaTeX syntax.

You can have blocks of computer code, starting and ending with `!bc` and `!ec` instructions, respectively.

```
!bc pycod
from math import sin, pi
def myfunc(x):
    return sin(pi*x)

import integrate
I = integrate.trapezoidal(myfunc, 0, pi, 100)
!ec
```

Such blocks are formatted as

```
from math import sin, pi
def myfunc(x):
    return sin(pi*x)

import integrate
I = integrate.trapezoidal(myfunc, 0, pi, 100)
```

A code block must come after some plain sentence (at least for successful output to `sphinx`, `rst`, and ASCII-close formats), not directly after a section/paragraph heading or a table.

One can also copy computer code directly from files, either the complete file or specified parts. Computer code is then never duplicated in the documentation (important for the principle of avoiding copying information!).

Another document can be included by writing `#include "mynote.do.txt"` at the beginning of a line. Doconce documents have extension `do.txt`. The `do` part stands for doconce, while the trailing `.txt` denotes a text document so that editors gives you plain text editing capabilities.

## 2.3 Macros (Newcommands), Cross-References, Index, and Bibliography

Doconce supports a type of macros via a LaTeX-style *newcommand* construction. The newcommands defined in a file with name `newcommand_replace.tex` are expanded when Doconce is filtered to other formats, except for LaTeX (since LaTeX performs the expansion itself). Newcommands in files with names `newcommands.tex` and `newcommands_keep.tex` are kept unaltered when Doconce text is filtered to other formats, except for the Sphinx format. Since Sphinx understands LaTeX math, but not newcommands if the Sphinx output is HTML, it makes most sense to expand all newcommands. Normally, a user will put all newcommands that appear in math blocks surrounded by `!bt` and `!et` in `newcommands_keep.tex` to keep them unchanged, at least if they contribute to make the raw LaTeX math text easier to read in the formats that cannot render LaTeX. Newcommands used elsewhere throughout the text will usually be placed in `newcommands_replace.tex` and expanded by Doconce. The definitions of newcommands in the `newcommands*.tex` files *must* appear on a single line (multi-line newcommands are too hard to parse with regular expressions).

Recent versions of Doconce also offer cross referencing, typically one can define labels below (sub)sections, in figure captions, or in equations, and then refer to these later. Entries in an index can be defined and result in an index at the end for the LaTeX and Sphinx formats. Citations to literature, with an accompanying bibliography in a file, are also supported. The syntax of labels, references, citations, and the bibliography closely resembles that of LaTeX, making it easy for Doconce documents to be integrated in LaTeX projects (manuals, books). For further details on functionality and syntax we refer to the `doc/manual/manual.do.txt` file (see the [demo page](#) for various formats of this document).

# FROM DOCONCE TO OTHER FORMATS

Transformation of a Doconce document `mydoc.do.txt` to various other formats applies the script `doconce format`:

```
Terminal> doconce format format mydoc.do.txt
```

or just

```
Terminal> doconce format format mydoc
```

## 3.1 Preprocessing

The `preprocess` and `mako` programs are used to preprocess the file, and options to `preprocess` and/or `mako` can be added after the filename. For example,

```
Terminal> doconce format latex mydoc -Dextra_sections -DVAR1=5      # preprocess
Terminal> doconce format latex yourdoc extra_sections=True VAR1=5  # mako
```

The variable `FORMAT` is always defined as the current format when running `preprocess` or `mako`. That is, in the last example, `FORMAT` is defined as `latex`. Inside the Doconce document one can then perform format specific actions through tests like `#if FORMAT == "latex"` (for `preprocess`) or `% if FORMAT == "latex":` (for `mako`).

## 3.2 Removal of inline comments

The command-line arguments `--no-preprocess` and `--no-mako` turn off running `preprocess` and `mako`, respectively.

Inline comments in the text are removed from the output by

```
Terminal> doconce format latex mydoc --skip_inline_comments
```

One can also remove all such comments from the original Doconce file by running:

```
Terminal> doconce remove_inline_comments mydoc
```

This action is convenient when a Doconce document reaches its final form and comments by different authors should be removed.

## 3.3 HTML

Making an HTML version of a Doconce file `mydoc.do.txt` is performed by

```
Terminal> doconce format html mydoc
```

The resulting file `mydoc.html` can be loaded into any web browser for viewing.

The HTML style can be defined either in the header of the HTML file or in an external CSS file. The latter is enabled by the command-line argument `--css=filename`. There is a default style with blue headings, and a style with the [solarized](#) color palette, specified by the `--html-solarized` command line argument. If there is no file with name `filename` in the `--css=filename` specification, the blue or solarized styles are written to `filename` and linked from the HTML document. You can provide your own style sheet either by replacing the content inside the `style` tags or by specifying a CSS file through the `--css=filename` option.

If the Pygments package (including the `pygmentize` program) is installed, code blocks are typeset with aid of this package. The command-line argument `--no-pygments-html` turns off the use of Pygments and makes code blocks appear with plain (`pre`) HTML tags. The option `--pygments-html-linenos` turns on line numbers in Pygments-formatted code blocks.

The HTML file can be embedded in a template if the Doconce document does not have a title (because then there will be no header and footer in the HTML file). The template file must contain valid HTML code and can have three “slots”: `%(title)s` for a title, `%(date)s` for a date, and `%(main)s` for the main body of text, i.e., the Doconce document translated to HTML. The title becomes the first heading in the Doconce document, and the date is extracted from the `DATE:` line, if present. With the template feature one can easily embed the text in the look and feel of a website. The template can be extracted from the source code of a page at the site; just insert `%(title)s` and `%(date)s` at appropriate places and replace the main bod of text by `%(main)s`. Here is an example:

```
Terminal> doconce format html mydoc --html-template=mytemplate.html
```

## 3.4 Blogs

Doconce can be used for writing blogs provided the blog site accepts raw HTML code. Google’s Blogger service ([blogname.blogspot.com](#)) is particularly well suited since it also allows extensive LaTeX mathematics via MathJax. Write the blog text as a Doconce document without any title, author, and date. Then generate HTML as described above. Copy the text and paste it into the text area in the blog, making sure the input format is HTML. On Google’s Blogger service you can use Doconce to generate blogs with LaTeX mathematics and pretty (pygmentized) blocks of computer code. See a [blog example](#) for details on blogging.

**Warning:** In the comments after the blog one cannot paste raw HTML code with MathJax scripts so there is no support for mathematics in the comments.

WordPress ([wordpress.com](#)) allows raw HTML code in blogs, but has very limited LaTeX support, basically only formulas. The `--wordpress` option to `doconce` modifies the HTML code such that all equations are typeset in a way that is acceptable to WordPress. There is a [doconce example](#) on blogging with mathematics and code on WordPress.

## 3.5 Pandoc and Markdown

Output in Pandoc’s extended Markdown format results from

```
Terminal> doconce format pandoc mydoc
```

The name of the output file is `mydoc.mkd`. From this format one can go to numerous other formats:

```
Terminal> pandoc -R -t mediawiki -o mydoc.mwk --toc mydoc.mkd
```

Pandoc supports `latex`, `html`, `odt` (OpenOffice), `docx` (Microsoft Word), `rtf`, `texinfo`, to mention some. The `-R` option makes Pandoc pass raw HTML or LaTeX to the output format instead of ignoring it, while the `--toc` option generates a table of contents. See the [Pandoc documentation](#) for the many features of the `pandoc` program.

Pandoc is useful to go from LaTeX mathematics to, e.g., HTML or MS Word. There are two ways (experiment to find the best one for your document): `doconce format pandoc` and then translating using `pandoc`, or `doconce format latex`, and then going from LaTeX to the desired format using `pandoc`. Here is an example on the latter strategy:

```
Terminal> doconce format latex mydoc
Terminal> doconce ptex2tex mydoc
Terminal> doconce replace '\Verb!' '\verb!' mydoc.tex
Terminal> pandoc -f latex -t docx -o mydoc.docx mydoc.tex
```

When we go through `pandoc`, only single equations or `align*` environments are well understood.

Note that Doconce applies the `Verb` macro from the `fancyvrb` package while `pandoc` only supports the standard `verb` construction for inline verbatim text. Moreover, quite some additional `doconce replace` and `doconce subst` edits might be needed on the `.mkd` or `.tex` files to successfully have mathematics that is well translated to MS Word. Also when going to reStructuredText using Pandoc, it can be advantageous to go via LaTeX.

Here is an example where we take a Doconce snippet (without title, author, and date), maybe with some unnumbered equations, and quickly generate HTML with mathematics displayed by MathJax:

```
Terminal> doconce format pandoc mydoc
Terminal> pandoc -t html -o mydoc.html -s --mathjax mydoc.mkd
```

The `-s` option adds a proper header and footer to the `mydoc.html` file. This recipe is a quick way of making HTML notes with (some) mathematics.

## 3.6 LaTeX

Making a LaTeX file `mydoc.tex` from `mydoc.do.txt` is done in two steps: .. Note: putting code blocks inside a list is not successful in many

*Step 1.* Filter the doconce text to a pre-LaTeX form `mydoc.p.tex` for the `ptex2tex` program (or `doconce ptex2tex`):

```
Terminal> doconce format latex mydoc
```

LaTeX-specific commands (“newcommands”) in math formulas and similar can be placed in files `newcommands.tex`, `newcommands_keep.tex`, or `newcommands_replace.tex` (see the section [Macros \(Newcommands\)](#), [Cross-References](#), [Index](#), and [Bibliography](#)). If these files are present, they are included in the LaTeX document so that your commands are defined.

An option `--latex-printed` makes some adjustments for documents aimed at being printed. For example, links to web resources are associated with a footnote listing the complete web address (URL).

*Step 2.* Run `ptex2tex` (if you have it) to make a standard LaTeX file,

```
Terminal> ptex2tex mydoc
```

In case you do not have `ptex2tex`, you may run a (very) simplified version:

```
Terminal> doconce ptex2tex mydoc
```

Note that Doconce generates a `.p.tex` file with some preprocessor macros that can be used to steer certain properties of the LaTeX document. For example, to turn on the Helvetica font instead of the standard Computer Modern font, run

```
Terminal> ptex2tex -DHELVETICA mydoc
Terminal> doconce ptex2tex mydoc -DHELVETICA # alternative
```

The title, authors, and date are by default typeset in a non-standard way to enable a nicer treatment of multiple authors having institutions in common. However, the standard LaTeX “maketitle” heading is also available through `-DLATEX_HEADING=traditional`. A separate titlepage can be generated by `-DLATEX_HEADING=titlepage`.

Preprocessor variables to be defined or undefined are

- `BOOK` for the “book” documentclass rather than the standard “article” class (necessary if you apply chapter headings)
- `PALATINO` for the Palatino font
- `HELVETIA` for the Helvetica font
- `A4PAPER` for A4 paper size
- `A6PAPER` for A6 paper size (suitable for reading on small devices)
- `MOVIE15` for using the movie15 LaTeX package to display movies
- `PREAMBLE` to turn the LaTeX preamble on or off (i.e., complete document or document to be included elsewhere)
- `MINTED` for inclusion of the minted package (which requires `latex` or `pdflatex` to be run with the `-shell-escape` option)

The `ptex2tex` tool makes it possible to easily switch between many different fancy formattings of computer or verbatim code in LaTeX documents. After any `!bc` command in the Doconce source you can insert verbatim block styles as defined in your `.ptex2tex.cfg` file, e.g., `!bc sys` for a terminal session, where `sys` is set to a certain environment in `.ptex2tex.cfg` (e.g., `CodeTerminal`). There are about 40 styles to choose from, and you can easily add new ones.

Also the `doconce ptex2tex` command supports preprocessor directives for processing the `.p.tex` file. The command allows specifications of code environments as well. Here is an example:

```
Terminal> doconce ptex2tex mydoc -DLATEX_HEADING=traditional \
-DPALATINO -DA6PAPER \
"sys=\begin{quote}\begin{verbatim}@\end{verbatim}\end{quote}" \
fpro=minted fcod=minted shcod=Verbatim envir=ans:nt
```

Note that `@` must be used to separate the begin and end LaTeX commands, unless only the environment name is given (such as `minted` above, which implies `\begin{minted}{fortran}` and `\end{minted}` as begin and end for blocks inside `!bc fpro` and `!ec`). Specifying `envir=ans:nt` means that all other environments are typeset with the `anslistings.sty` package, e.g., `!bc cppcod` will then result in `\begin{c++}`. If no environments like `sys`, `fpro`, or the common `envir` are defined on the command line, the plain `\begin{verbatim}` and `\end{verbatim}` are used.

*Step 2b (optional).* Edit the `mydoc.tex` file to your needs. For example, you may want to substitute `section` by `section*` to avoid numbering of sections, you may want to insert linebreaks (and perhaps space) in the title, etc. This can be automatically edited with the aid of the `doconce replace` and `doconce subst` commands. The

former works with substituting text directly, while the latter performs substitutions using regular expressions. Here are two examples:

```
Terminal> doconce replace 'section{' 'section*{' mydoc.tex
Terminal> doconce subst 'title\{(.+)Using (.+)\}' \
'title{\g<1> \\\ [1.5mm] Using \g<2>}' mydoc.tex
```

A lot of tailored fixes to the LaTeX document can be done by an appropriate set of text replacements and regular expression substitutions. You are anyway encouraged to make a script for generating PDF from the LaTeX file.

*Step 3. Compile mydoc.tex and create the PDF file:*

```
Terminal> latex mydoc
Terminal> latex mydoc
Terminal> makeindex mydoc    # if index
Terminal> bibitem mydoc      # if bibliography
Terminal> latex mydoc
Terminal> dvipdf mydoc
```

If one wishes to run `ptex2tex` and use the minted LaTeX package for typesetting code blocks (Minted\_Python, Minted\_Cpp, etc., in `ptex2tex` specified through the `*pro` and `*cod` variables in `.ptex2tex.cfg` or `$HOME/.ptex2tex.cfg`), the minted LaTeX package is needed. This package is included by running `ptex2tex` with the `-DMINTED` option:

```
Terminal> ptex2tex -DMINTED mydoc
```

In this case, `latex` must be run with the `-shell-escape` option:

```
Terminal> latex -shell-escape mydoc
Terminal> latex -shell-escape mydoc
Terminal> makeindex mydoc    # if index
Terminal> bibitem mydoc      # if bibliography
Terminal> latex -shell-escape mydoc
Terminal> dvipdf mydoc
```

When running `doconce ptex2tex mydoc enviro=minted` (or other minted specifications with `doconce ptex2tex`), the minted package is automatically included so there is no need for the `-DMINTED` option.

## 3.7 PDFLaTeX

Running `pdflatex` instead of `latex` follows almost the same steps, but the start is

```
Terminal> doconce format latex mydoc
```

Then `ptex2tex` is run as explained above, and finally

```
Terminal> pdflatex -shell-escape mydoc
Terminal> makeindex mydoc    # if index
Terminal> bibitem mydoc      # if bibliography
Terminal> pdflatex -shell-escape mydoc
```

## 3.8 Plain ASCII Text

We can go from Doconce “back to” plain untagged text suitable for viewing in terminal windows, inclusion in email text, or for insertion in computer source code:



```
Terminal> doconce format plain mydoc.do.txt # results in mydoc.txt
```

## 3.9 reStructuredText

Going from Doconce to reStructuredText gives a lot of possibilities to go to other formats. First we filter the Doconce text to a reStructuredText file `mydoc.rst`:

```
Terminal> doconce format rst mydoc.do.txt
```

We may now produce various other formats:

```
Terminal> rst2html.py mydoc.rst > mydoc.html # html
Terminal> rst2latex.py mydoc.rst > mydoc.tex # latex
Terminal> rst2xml.py mydoc.rst > mydoc.xml # XML
Terminal> rst2odt.py mydoc.rst > mydoc.odt # OpenOffice
```

The OpenOffice file `mydoc.odt` can be loaded into OpenOffice and saved in, among other things, the RTF format or the Microsoft Word format. However, it is more convenient to use the program `unoconv` to convert between the many formats OpenOffice supports *on the command line*. Run

```
Terminal> unoconv --show
```

to see all the formats that are supported. For example, the following commands take `mydoc.odt` to Microsoft Office Open XML format, classic MS Word format, and PDF:

```
Terminal> unoconv -f ooxml mydoc.odt
Terminal> unoconv -f doc mydoc.odt
Terminal> unoconv -f pdf mydoc.odt
```

*Remark about Mathematical Typesetting.* At the time of this writing, there is no easy way to go from Doconce and LaTeX mathematics to reST and further to OpenOffice and the “MS Word world”. Mathematics is only fully supported by `latex` as output and to a wide extent also supported by the `sphinx` output format. Some links for going from LaTeX to Word are listed below.

- <http://ubuntuforums.org/showthread.php?t=1033441>
- <http://tug.org/utilities/texconv/textopc.html>
- <http://nileshbansal.blogspot.com/2007/12/latex-to-openofficeword.html>

## 3.10 Sphinx

Sphinx documents demand quite some steps in their creation. We have automated most of the steps through the `doconce sphinx_dir` command:

```
Terminal> doconce sphinx_dir author="authors' names" \
          title="some title" version=1.0 dirname=sphinx_dir \
          theme=mytheme file1 file2 file3 ...
```

The keywords `author`, `title`, and `version` are used in the headings of the Sphinx document. By default, `version` is 1.0 and the script will try to deduce authors and title from the doconce files `file1`, `file2`, etc. that together represent the whole document. Note that none of the individual Doconce files `file1`, `file2`, etc. should include the rest as their union makes up the whole document. The default value of `dirname` is `sphinx-rootdir`. The `theme` keyword is used to set the theme for design of HTML output from Sphinx (the default theme is `'default'`).

With a single-file document in `mydoc.do.txt` one often just runs

```
Terminal> doconce sphinx_dir mydoc
```

and then an appropriate Sphinx directory `sphinx-rootdir` is made with relevant files.

The `doconce sphinx_dir` command generates a script `automake_sphinx.py` for compiling the Sphinx document into an HTML document. One can either run `automake_sphinx.py` or perform the steps in the script manually, possibly with necessary modifications. You should at least read the script prior to executing it to have some idea of what is done.

The `doconce sphinx_dir` script copies directories named `figs` or `figures` over to the Sphinx directory so that figures are accessible in the Sphinx compilation. If figures or movies are located in other directories, `automake_sphinx.py` must be edited accordingly. Files, to which there are local links (not `http:` or `file:` URLs), must be placed in the `_static` subdirectory of the Sphinx directory. The utility `doconce sphinxfix_localURLs` is run to check for local links in the Doconce file: for each such link, say `dir1/dir2/myfile.txt` it replaces the link by `_static/myfile.txt` and copies `dir1/dir2/myfile.txt` to a local `_static` directory (in the same directory as the script is run). However, we recommend instead that the writer of the document places files in `_static` or lets a script do it automatically. The user must copy all `_static/*` files to the `_static` subdirectory of the Sphinx directory. It may be wise to always put files, to which there are local links in the Doconce document, in a `_static` or `_static-name` directory and use these local links. Then links do not need to be modified when creating a Sphinx version of the document.

Doconce comes with a collection of HTML themes for Sphinx documents. These are packed out in the Sphinx directory, the `conf.py` configuration file for Sphinx is edited accordingly, and a script `make-themes.sh` can make HTML documents with one or more themes. For example, to realize the themes `fenics` and `pyramid`, one writes

```
Terminal> ./make-themes.sh fenics pyramid
```

The resulting directories with HTML documents are `_build/html_fenics` and `_build/html_pyramid`, respectively. Without arguments, `make-themes.sh` makes all available themes (!).

If it is not desirable to use the autogenerated scripts explained above, here is the complete manual procedure of generating a Sphinx document from a file `mydoc.do.txt`.

*Step 1.* Translate Doconce into the Sphinx format:

```
Terminal> doconce format sphinx mydoc
```

*Step 2.* Create a Sphinx root directory either manually or by using the interactive `sphinx-quickstart` program. Here is a scripted version of the steps with the latter:

```
mkdir sphinx-rootdir
sphinx-quickstart <<EOF
sphinx-rootdir
n
—
Name of My Sphinx Document
Author
version
version
.rst
index
n
Y
n
n
n
n
n
```

```
Y
n
n
Y
Y
Y
EOF
```

The autogenerated `conf.py` file may need some edits if you want to specific layout (Sphinx themes) of HTML pages. The `doconce sphinx_dir` generator makes an extended `conf.py` file where, among other things, several useful Sphinx extensions are included.

*Step 3.* Copy the `mydoc.rst` file to the Sphinx root directory:

```
Terminal> cp mydoc.rst sphinx-rootdir
```

If you have figures in your document, the relative paths to those will be invalid when you work with `mydoc.rst` in the `sphinx-rootdir` directory. Either edit `mydoc.rst` so that figure file paths are correct, or simply copy your figure directories to `sphinx-rootdir`. Links to local files in `mydoc.rst` must be modified to links to files in the `_static` directory, see comment above.

*Step 4.* Edit the generated `index.rst` file so that `mydoc.rst` is included, i.e., add `mydoc` to the `toctree` section so that it becomes

```
.. toctree::
    :maxdepth: 2

    mydoc
```

(The spaces before `mydoc` are important!)

*Step 5.* Generate, for instance, an HTML version of the Sphinx source:

```
make clean    # remove old versions
make html
```

Sphinx can generate a range of different formats: standalone HTML, HTML in separate directories with `index.html` files, a large single HTML file, JSON files, various help files (the `qthelp`, `HTML`, and `Devhelp` projects), `epub`, `LaTeX`, `PDF` (via `LaTeX`), `pure text`, `man pages`, and `Texinfo` files.

*Step 6.* View the result:

```
Terminal> firefox _build/html/index.html
```

Note that verbatim code blocks can be typeset in a variety of ways depending the argument that follows `!bc:` `cod` gives Python (`code-block:: python` in Sphinx syntax) and `cppcod` gives C++, but all such arguments can be customized both for Sphinx and LaTeX output.

## 3.11 Wiki Formats

There are many different wiki formats, but Doconce only supports three: [Googlecode wiki](#), [MediaWiki](#), and [Creole Wiki](#). These formats are called `gwiki`, `mwiki`, and `cwiki`, respectively. Transformation from Doconce to these formats is done by

```
Terminal> doconce format gwiki mydoc.do.txt
Terminal> doconce format mwiki mydoc.do.txt
Terminal> doconce format cwiki mydoc.do.txt
```

The produced MediaWiki can be tested in the [sandbox of wikibooks.org](#). The format works well with Wikipedia, Wikibooks, and [ShoutWiki](#), but not always well elsewhere (see [this example](#)).

Large MediaWiki documents can be made with the [Book creator](#). From the MediaWiki format one can go to other formats with aid of [mwlib](#). This means that one can easily use Doconce to write [Wikibooks](#) and publish these in PDF and MediaWiki format, while at the same time, the book can also be published as a standard LaTeX book, a Sphinx web document, or a collection of HTML files.

The Googlecode wiki document, `mydoc.gwiki`, is most conveniently stored in a directory which is a clone of the wiki part of the Googlecode project. This is far easier than copying and pasting the entire text into the wiki editor in a web browser.

When the Doconce file contains figures, each figure filename must in the `.gwiki` file be replaced by a URL where the figure is available. There are instructions in the file for doing this. Usually, one performs this substitution automatically (see next section).

## 3.12 Tweaking the Doconce Output

Occasionally, one would like to tweak the output in a certain format from Doconce. One example is figure filenames when transforming Doconce to reStructuredText. Since Doconce does not know if the `.rst` file is going to be filtered to LaTeX or HTML, it cannot know if `.eps` or `.png` is the most appropriate image filename. The solution is to use a text substitution command or code with, e.g., `sed`, `perl`, `python`, or `scitools subst`, to automatically edit the output file from Doconce. It is then wise to run Doconce and the editing commands from a script to automate all steps in going from Doconce to the final format(s). The `make.sh` files in `docs/manual` and `docs/tutorial` constitute comprehensive examples on how such scripts can be made.

## 3.13 Demos

The current text is generated from a Doconce format stored in the file

```
docs/tutorial/tutorial.do.txt
```

The file `make.sh` in the `tutorial` directory of the Doconce source code contains a demo of how to produce a variety of formats. The source of this tutorial, `tutorial.do.txt` is the starting point. Running `make.sh` and studying the various generated files and comparing them with the original `tutorial.do.txt` file, gives a quick introduction to how Doconce is used in a real case. [Here](#) is a sample of how this tutorial looks in different formats.

There is another demo in the `docs/manual` directory which translates the more comprehensive documentation, `manual.do.txt`, to various formats. The `make.sh` script runs a set of translations.



# INSTALLATION OF DOCONCE AND ITS DEPENDENCIES

## 4.1 Doconce

Doconce itself is pure Python code hosted at <http://code.google.com/p/doconce>. Its installation from the Mercurial (hg) source follows the standard procedure:

```
# Doconce
hg clone https://code.google.com/p/doconce/ doconce
cd doconce
sudo python setup.py install
cd ..
```

Since Doconce is frequently updated, it is recommended to use the above procedure and whenever a problem occurs, make sure to update to the most recent version:

```
cd doconce
hg pull
hg update
sudo python setup.py install
```

Debian GNU/Linux users can also run

```
sudo apt-get install doconce
```

This installs the latest release and not the most updated and bugfixed version. On Ubuntu one needs to run

```
sudo add-apt-repository ppa:scitools/ppa
sudo apt-get update
sudo apt-get install doconce
```

## 4.2 Dependencies

### 4.2.1 Preprocessors

If you make use of the [Preprocess](#) preprocessor, this program must be installed:

```
svn checkout http://preprocess.googlecode.com/svn/trunk/ preprocess
cd preprocess
cd doconce
```

```
sudo python setup.py install
cd ..
```

A much more advanced alternative to Preprocess is [Mako](#). Its installation is most conveniently done by `pip`,

```
pip install Mako
```

This command requires `pip` to be installed. On Debian Linux systems, such as Ubuntu, the installation is simply done by

```
sudo apt-get install python-pip
```

Alternatively, one can install from the `pip` [source code](#).

Mako can also be installed directly from [source](#): download the tarball, pack it out, go to the directory and run the usual

```
sudo python setup.py install.
```

### 4.2.2 Image file handling

Different output formats require different formats of image files. For example, PostScript or Encapsulated PostScript is required for `latex` output, while HTML needs JPEG, GIF, or PNG formats. Doconce calls up programs from the ImageMagick suite for converting image files to a proper format if needed. The [ImageMagick suite](#) can be installed on all major platforms. On Debian Linux (including Ubuntu) systems one can simply write

```
sudo apt-get install imagemagick
```

The convenience program `doconce combine_images`, for combining several images into one, will use `montage` and `convert` from ImageMagick and the `pdftk`, `pdfnup`, and `pdfcrop` programs from the `texlive-extra-utils` Debian package. The latter gets installed by

```
sudo apt-get install texlive-extra-utils
```

### 4.2.3 Spellcheck

The utility `doconce spellcheck` applies the `ispell` program for spellcheck. On Debian (including Ubuntu) it is installed by

```
sudo apt-get install ispell
```

### 4.2.4 Ptex2tex for LaTeX Output

To make LaTeX documents with very flexible choice of typesetting of verbatim code blocks you need [ptex2tex](#), which is installed by

```
svn checkout http://ptex2tex.googlecode.com/svn/trunk/ ptex2tex
cd ptex2tex
sudo python setup.py install
```

It may happen that you need additional style files, you can run a script, `cp2texmf.sh`:

```
cd latex
sh cp2texmf.sh # copy stylefiles to ~/texmf directory
cd ../../
```

This script copies some special stylefiles that that `ptex2tex` potentially makes use of. Some more standard stylefiles are also needed. These are installed by

```
sudo apt-get install texlive-latex-recommended texlive-latex-extra
```

on Debian Linux (including Ubuntu) systems. TeXShop on Mac comes with the necessary stylefiles (if not, they can be found by googling and installed manually in the `~/texmf/tex/latex/misc` directory).

Note that the `doconce ptex2tex` command, which needs no installation beyond Doconce itself, can be used as a simpler alternative to the `ptex2tex` program.

The *minted* LaTeX style is offered by `ptex2tex` and `doconce ptext2tex` and popular among many users. This style requires the package `Pygments` to be installed. On Debian Linux,

```
sudo apt-get install python-pygments
```

Alternatively, the package can be installed manually:

```
hg clone ssh://hg@bitbucket.org/birkenfeld/pygments-main pygments
cd pygments
sudo python setup.py install
```

If you use the *minted* style together with `ptex2tex`, you have to enable it by the `-DMINTED` command-line argument to `ptex2tex`. This is not necessary if you run the alternative `doconce ptex2tex` program.

All use of the *minted* style requires the `-shell-escape` command-line argument when running LaTeX, i.e., `latex -shell-escape` or `pdflatex -shell-escape`.

## 4.2.5 reStructuredText (reST) Output

The `rst` output from Doconce allows further transformation to LaTeX, HTML, XML, OpenOffice, and so on, through the `docutils` package. The installation of the most recent version can be done by

```
svn checkout http://docutils.svn.sourceforge.net/svnroot/docutils/trunk/docutils
cd docutils
sudo python setup.py install
cd ..
```

To use the OpenOffice suite you will typically on Debian systems install

```
sudo apt-get install unovonv libreoffice libreoffice-dmaths
```

There is a possibility to create PDF files from reST documents using ReportLab instead of LaTeX. The enabling software is `rst2pdf`. Either download the tarball or clone the svn repository, go to the `rst2pdf` directory and run the usual `sudo python setup.py install`.

Output to sphinx requires of course the `Sphinx` software, installed by

```
hg clone https://bitbucket.org/birkenfeld/sphinx
cd sphinx
sudo python setup.py install
cd ..
```

## 4.2.6 Markdown and Pandoc Output

The Doconce format `pandoc` outputs the document in the Pandoc extended Markdown format, which via the `pandoc` program can be translated to a range of other formats. Installation of `Pandoc`, written in Haskell, is most easily done by



```
sudo apt-get install pandoc
```

on Debian (Ubuntu) systems.

### 4.2.7 Epydoc Output

When the output format is epydoc one needs that program too, installed by

```
svn co https://epydoc.svn.sourceforge.net/svnroot/epydoc/trunk/epydoc epydoc
cd epydoc
sudo make install
cd ..
```

*Remark.* Several of the packages above installed from source code are also available in Debian-based system through the `apt-get install` command. However, we recommend installation directly from the version control system repository as there might be important updates and bug fixes. For `svn` directories, go to the directory, run `svn update`, and then `sudo python setup.py install`. For Mercurial (`hg`) directories, go to the directory, run `hg pull`; `hg update`, and then `sudo python setup.py install`.

# INDICES AND TABLES

- *genindex*
- *modindex*
- *search*

## tutorial.xml

```

<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE document PUBLIC "-//IDN docutils.sourceforge.net//DTD Docutils Generic
//EN//XML" "http://docutils.sourceforge.net/docs/ref/docutils.dtd">
<!-- Generated by Docutils 0.9 -->
<document source="tutorial.rst"><comment xml:space="preserve">Automatically gene
rated reST file from Doconce source
(http://code.google.com/p/doconce/)</comment><comment xml:space="preserve">Missi
ng: FIGURE, MOVIE, environments</comment><section ids="doconce-document-once-inc
lude-anywhere" names="doconce:\ document\ once,\ include\ anywhere"><title>Docon
ce: Document Once, Include Anywhere</title><field_list><field><field_name>Author
</field_name><field_body><paragraph>Hans Petter Langtangen</paragraph></field_bo
dy></field><field><field_name>Date</field_name><field_body><paragraph>Jan 30, 20
13</paragraph><bullet_list bullet="*"><list_item><paragraph>When writing a note,
report, manual, etc., do you find it difficult
to choose the typesetting format? That is, to choose between plain
(email-like) text, wiki, Word/OpenOffice, LaTeX, HTML,
reStructuredText, Sphinx, XML, etc. Would it be convenient to
start with some very simple text-like format that easily converts
to the formats listed above, and then at some later stage
eventually go with a particular format?</paragraph></list_item><list_item><parag
raph>Do you need to write documents in varying formats but find it
difficult to remember all the typesetting details of various
formats like <reference name="LaTeX" refuri="http://refcards.com/docs/silvermanj
/amslatex/LaTeXRefCard.v2.0.pdf">LaTeX</reference><target ids="latex" names="lat
ex" refuri="http://refcards.com/docs/silvermanj/amslatex/LaTeXRefCard.v2.0.pdf"/
>, <reference name="HTML" refuri="http://www.htmlcodetutorial.com/">HTML</refere
nce><target ids="html" names="html" refuri="http://www.htmlcodetutorial.com/">,
<reference name="reStructuredText" refuri="http://docutils.sourceforge.net/docs
/ref/rst/restructuredtext.html">reStructuredText</reference><target ids="restruc
turedtext" names="restructuredtext" refuri="http://docutils.sourceforge.net/docs
/ref/rst/restructuredtext.html"/>, <reference name="Sphinx" refuri="http://sphin
x.pocoo.org/contents.html">Sphinx</reference><target ids="sphinx" names="sphinx"
refuri="http://sphinx.pocoo.org/contents.html"/>, and <reference name="wiki" re
furi="http://code.google.com/p/support/wiki/WikiSyntax">wiki</reference><target
ids="wiki" names="wiki" refuri="http://code.google.com/p/support/wiki/WikiSyntax
"/>? Would it be convenient
to generate the typesetting details of a particular format from a
very simple text-like format with minimal tagging?</paragraph></list_item><list_
item><paragraph>Do you have the same information scattered around in different
documents in different typesetting formats? Would it be a good idea
to write things once, in one format, stored in one place, and
include it anywhere?</paragraph></list_item></bullet_list></field_body></field><
/field_list><paragraph>If any of these questions are of interest, you should kee
p on reading.</paragraph></section><section ids="what-does-doconce-look-like" na
mes="what\ does\ doconce\ look\ like?"><title>What Does Doconce Look Like?</titl
e><paragraph>Doconce text looks like ordinary text, but there are some almost in
visible
text constructions that allow you to control the formatting. Here are
som examples.</paragraph><block_quote><bullet_list bullet="*"><list_item><paragr
aph>Bullet lists arise from lines starting with <literal>*</literal>.</paragr
aph></list_item><list_item><paragraph><emphasis>Emphasized words</emphasis> are sur
rounded by <literal>*</literal>.</paragraph></list_item><list_item><paragraph><s
trong>Words in boldface</strong> are surrounded by underscores.</paragraph></lis
t_item><list_item><paragraph>Words from computer code are enclosed in back quote
s and
then typeset <literal>verbatim (in a monospace font)</literal>.</paragraph></lis
t_item><list_item><paragraph>Section headings are recognised by equality (<litera
l>=</literal>) signs before
and after the title, and the number of <literal>=</literal> signs indicates the

```

”

**tutorial.xml**

”

level of the section: 7 for main section, 5 for subsection, and 3 for subsubsection.

Paragraph headings are recognized by a double underscore before and after the heading.

The abstract of a document starts with **Abstract** as paragraph heading, and all text up to the next heading makes up the abstract.

Blocks of computer code can easily be included by placing `<literal>!bc</literal>` (begin code) and `<literal>!ec</literal>` (end code) commands at separate lines before and after the code block.

Blocks of computer code can also be imported from source files.

Blocks of LaTeX mathematics can easily be included by placing `<literal>!bt</literal>` (begin TeX) and `<literal>!et</literal>` (end TeX) commands at separate lines before and after the math block.

There is support for both LaTeX and text-like inline mathematics.

Figures and movies with captions, simple tables, URLs with links, index list, labels and references are supported.

Invisible comments in the output format can be inserted throughout the text.

Visible comments can be inserted so that authors and readers can comment upon the text (and at any time turn on/off output of such comments).

There is an exercise environment with many advanced features.

With a preprocessor, Preprocess or Mako, one can include other documents (files) and large portions of text can be defined in or out of the text.

With Mako one can also have Python code embedded in the Doconce document and thereby parameterize the text (e.g., one text can describe programming in two languages).

Here is an example of some simple text written in the Doconce format:

```

===== A Subsection with Sample Text =====
label{my:first:sec}

```

Ordinary text looks like ordinary text, and the tags used for `_boldface_` words, `*emphasized*` words, and `'computer'` words look natural in plain text. Lists are typeset as you would do in email,

- \* item 1
- \* item 2
- \* item 3

Lists can also have automatically numbered items instead of bullets,

- o item 1
- o item 2
- o item 3

URLs with a link word are possible, as in `&quot;hpl&quot;; &quot;http://folk.uio.no/hpl&quot;;`.

If the word is URL, the URL itself becomes the link name, as in `&quot;URL&quot;; &quot;tutorial.do.txt&quot;;`.

References to sections may use logical names as labels (e.g., a `&quot;label&quot;` command right after the section title), as in the reference to

”

”

”

## tutorial.xml

Section ref{my:first:sec}.

Doconce also allows inline comments of the form [name: comment] (with a space after 'name:'), e.g., such as [hpl: here I will make some remarks to the text]. Inline comments can be removed from the output by a command-line argument (see Section ref{doconce2formats} for an example).

Tables are also supported, e.g.,

time	velocity	acceleration
0.0	1.4186	-5.01
2.0	1.376512	11.919
4.0	1.1E+1	14.717624

# lines beginning with # are comment lines

The Doconce text above results in the following little document:

<target refid="my-first-sec"/><section ids="a-subsection-with-sample-text my-first-sec" names="a\ subsection\ with\ sample\ text my:first:sec"><title>A Subsection with Sample Text</title><paragraph>Ordinary text looks like ordinary text, and the tags used for

<strong>boldface</strong> words, <emphasis>emphasized</emphasis> words, and <literal>computer</literal> words look natural in plain text. Lists are typeset as you would do in an email,

<block\_quote><bullet\_list bullet="\*"><list\_item><paragraph>item 1</paragraph></list\_item><list\_item><paragraph>item 2</paragraph></list\_item><list\_item><paragraph>item 3</paragraph></list\_item></bullet\_list></block\_quote><paragraph>Lists can also have numbered items instead of bullets, just use an <literal>o</literal>

(for ordered) instead of the asterisk:

<block\_quote><enumerated\_list enumtype="arabic" prefix="" suffix="."><list\_item><paragraph>item 1</paragraph></list\_item><list\_item><paragraph>item 2</paragraph></list\_item><list\_item><paragraph>item 3</paragraph></list\_item></enumerated\_list></block\_quote><paragraph>URLs with a link word are possible, as in <reference name="hpl" refuri="http://folk.uio.no/hpl">hpl</reference><target ids="hpl" names="hpl" refuri="http://folk.uio.no/hpl"/>.

If the word is URL, the URL itself becomes the link name, as in <reference name="tutorial.do.txt" refuri="tutorial.do.txt">tutorial.do.txt</reference><target ids="tutorial-do-txt" names="tutorial.do.txt" refuri="tutorial.do.txt"/>.</paragraph><paragraph>References to sections may use logical names as labels (e.g., a

"label" command right after the section title), as in the reference to the section <reference name="A Subsection with Sample Text" refid="a-subsection-with-sample-text">A Subsection with Sample Text</reference>.</paragraph><paragraph>Doconce also allows inline comments such as (<strong>hpl</strong>: here I will make

some remarks to the text) for allowing authors to make notes. Inline comments can be removed from the output by a command-line argument

(see the section <reference name="From Doconce to Other Formats" refid="from-doc-once-to-other-formats">From Doconce to Other Formats</reference> for an example)

</paragraph><paragraph>Tables are also supported, e.g.,</paragraph><table><tr><td>time</td><td>velocity</td><td>acceleration</td></tr><tr><td>0.0</td><td>1.4186</td><td>-5.01</td></tr><tr><td>2.0</td><td>1.376512</td><td>11.919</td></tr><tr><td>4.0</td><td>1.1E+1</td><td>14.717624</td></tr></table>

"	tutorial.xml	"
	<pre> entry&gt;&lt;paragraph&gt;2.0&lt;/paragraph&gt;&lt;/entry&gt;&lt;entry&gt;&lt;paragraph&gt;1.376512&lt;/paragraph&gt;&lt;/entry&gt;&lt;entry&gt;&lt;paragraph&gt;11.919&lt;/paragraph&gt;&lt;/entry&gt;&lt;/row&gt;&lt;row&gt;&lt;entry&gt;&lt;paragraph&gt;4.0&lt;/paragraph&gt;&lt;/entry&gt;&lt;entry&gt;&lt;paragraph&gt;1.1E+1&lt;/paragraph&gt;&lt;/entry&gt;&lt;entry&gt;&lt;paragraph&gt;14.717624&lt;/paragraph&gt;&lt;/entry&gt;&lt;/row&gt;&lt;/tbody&gt;&lt;/tgroup&gt;&lt;/table&gt;&lt;/section&gt;&lt;section ids="mathematics-and-computer-code" names="mathematics\ and\ computer\ code"&gt; &lt;title&gt;Mathematics and Computer Code&lt;/title&gt;&lt;paragraph&gt;Inline mathematics, such as <math>v = \sin(x)</math>, allows the formula to be specified both as LaTeX and as plain text. This results in a professional LaTeX typesetting, but in other formats the text version normally looks better than raw LaTeX mathematics with backslashes. An inline formula like <math>v = \sin(x)</math> is typeset as:&lt;/paragraph&gt;&lt;literal_block xml:space="preserve"&gt;\nu = \sin(x)\$ v = \sin(x)\$&lt;/literal_block&gt;&lt;paragraph&gt;The pipe symbol acts as a delimiter between La TeX code and the plain text version of the formula. If you write a lot of mathematics, only the output formats &lt;literal&gt;latex&lt;/literal&gt;, &lt;literal&gt;pdflatex&lt;/literal&gt;, &lt;literal&gt;h tml&lt;/literal&gt;, &lt;literal&gt;sphinx&lt;/literal&gt;, and &lt;literal&gt;pandoc&lt;/literal&gt; are of interest and all these support inline LaTeX mathematics so then you will naturally drop the pipe symbol and write just:&lt;/paragraph&gt;&lt;literal_block xml:space="preser ve"&gt;\nu = \sin(x)\$&lt;/literal_block&gt;&lt;paragraph&gt;However, if you want more textual formats, like plain text or reStructuredText, the text after the pipe symbol may help to make the math formula more readable if there are backslashes or other special LaTeX symbols in the LaTeX code.&lt;/parag raph&gt;&lt;paragraph&gt;Blocks of mathematics are typeset with raw LaTeX, inside &lt;literal&gt;!bt&lt;/literal&gt; and &lt;literal&gt;!et&lt;/literal&gt; (begin TeX, end TeX) instructi ons:&lt;/paragraph&gt;&lt;literal_block xml:space="preserve"&gt;!bt \begin{align} \{\partial u\over\partial t\} \ \&amp;= \ \nabla^2 u + f, \text{label}\{myeq1\}\\ \{\partial v\over\partial t\} \ \&amp;= \ \nabla\cdot(q(u)\nabla v) + g \end{align} !et&lt;/literal_block&gt;&lt;comment xml:space="preserve"&gt;Note: !bt and !et (and !bc and !ec below) are used to illustrate&lt;/comment&gt;&lt;comment xml:space="preserve"&gt;tex and code blocks in inside verbatim blocks and are replaced&lt;/comment&gt;&lt;comment xml:sp ace="preserve"&gt;by !bt, !et, !bc, and !ec after all other formatting is finished. &lt;/comment&gt;&lt;paragraph&gt;The result looks like this:&lt;/paragraph&gt;&lt;literal_block xml:s pace="preserve"&gt;\begin{align} \{\partial u\over\partial t\} \ \&amp;= \ \nabla^2 u + f, \text{label}\{myeq1\}\\ \{\partial v\over\partial t\} \ \&amp;= \ \nabla\cdot(q(u)\nabla v) + g \end{align}&lt;/literal_block&gt;&lt;paragraph&gt;Of course, such blocks only looks nice in formats with support for LaTeX mathematics, and here the align environment in particular (this includes &lt;literal&gt;latex&lt;/literal&gt;, &lt;literal&gt;pdflatex&lt;/literal&gt;, &lt;literal&gt;h tml&lt;/literal&gt;, and &lt;literal&gt;sphinx&lt;/literal&gt;). The raw LaTeX syntax appears in simpler formats, but can still be useful for those who can read LaTeX syntax.&lt;/paragraph&gt;&lt;paragraph&gt;You can have blocks o f computer code, starting and ending with &lt;literal&gt;!bc&lt;/literal&gt; and &lt;literal&gt;!ec&lt;/literal&gt; instructions, respectively:&lt;/p aragraph&gt;&lt;literal_block xml:space="preserve"&gt;!bc pycod from math import sin, pi def myfunc(x):     return sin(pi*x)  import integrate I = integrate.trapezoidal(myfunc, 0, pi, 100) !ec&lt;/literal_block&gt;&lt;paragraph&gt;Such blocks are formatted as:&lt;/paragraph&gt;&lt;literal_ block xml:space="preserve"&gt;from math import sin, pi def myfunc(x):     return sin(pi*x) </pre>	

## tutorial.xml

```
import integrate
I = integrate.trapezoidal(myfunc, 0, pi, 100)</literal_block><paragraph>A code b
lock must come after some plain sentence (at least for successful
output to <literal>sphinx</literal>, <literal>rst</literal>, and ASCII-close for
mats),
not directly after a section/paragraph heading or a table.</paragraph><paragraph>
One can also copy computer code directly from files, either the
complete file or specified parts. Computer code is then never
duplicated in the documentation (important for the principle of
avoiding copying information!).</paragraph><paragraph>Another document can be in
cluded by writing <literal># #include &quot;mynote.do.txt&quot;</literal>
at the beginning of a line. Doconce documents have
extension <literal>do.txt</literal>. The <literal>do</literal> part stands for d
oconce, while the
trailing <literal>.txt</literal> denotes a text document so that editors gives y
ou
plain text editing capabilities.</paragraph><target refid="newcommands"/></secti
on><section ids="macros-newcommands-cross-references-index-and-bibliography newc
ommands" names="macros\ (newcommands),\ cross-references,\ index,\ and\ bibliogr
aphy newcommands"><title>Macros (Newcommands), Cross-References, Index, and Bibl
iography</title><paragraph>Doconce supports a type of macros via a LaTeX-style <
emphasis>newcommand</emphasis>
construction. The newcommands defined in a file with name
<literal>newcommand_replace.tex</literal> are expanded when Doconce is filtered
to
other formats, except for LaTeX (since LaTeX performs the expansion
itself). Newcommands in files with names <literal>newcommands.tex</literal> and
<literal>newcommands_keep.tex</literal> are kept unaltered when Doconce text is
filtered to other formats, except for the Sphinx format. Since Sphinx
understands LaTeX math, but not newcommands if the Sphinx output is
HTML, it makes most sense to expand all newcommands. Normally, a user
will put all newcommands that appear in math blocks surrounded by
<literal>!bt</literal> and <literal>!et</literal> in <literal>newcommands_keep.t
ex</literal> to keep them unchanged, at
least if they contribute to make the raw LaTeX math text easier to
read in the formats that cannot render LaTeX. Newcommands used
elsewhere throughout the text will usually be placed in
<literal>newcommands_replace.tex</literal> and expanded by Doconce. The definit
ions of
newcommands in the <literal>newcommands*.tex</literal> files <emphasis>must</emp
hasis> appear on a single
line (multi-line newcommands are too hard to parse with regular
expressions).</paragraph><paragraph>Recent versions of Doconce also offer cross
referencing, typically one
can define labels below (sub)sections, in figure captions, or in
equations, and then refer to these later. Entries in an index can be
defined and result in an index at the end for the LaTeX and Sphinx
formats. Citations to literature, with an accompanying bibliography in
a file, are also supported. The syntax of labels, references,
citations, and the bibliography closely resembles that of LaTeX,
making it easy for Doconce documents to be integrated in LaTeX
projects (manuals, books). For further details on functionality and
syntax we refer to the <literal>doc/manual/manual.do.txt</literal> file (see the
<reference name="demo page" refuri="https://doconce.googlecode.com/hg/doc/demos/
manual/index.html">demo page</reference><target ids="demo-page" names="demo\ pag
e" refuri="https://doconce.googlecode.com/hg/doc/demos/manual/index.html"/>
for various formats of this document).</paragraph><comment xml:space="preserve">
Example on including another Doconce file (using preprocess):</comment><target r
```

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**tutorial.xml**

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```

efid="doconce2formats"/></section></section><section ids="from-doconce-to-other-formats doconce2formats" names="from\ doconce\ to\ other\ formats doconce2formats"><title>From Doconce to Other Formats</title><paragraph>Transformation of a Doconce document <literal>mydoc.do.txt</literal> to various other formats applies the script <literal>doconce format</literal>:</paragraph><literal_block xml:space="preserve">Terminal> doconce format format mydoc.do.txt</literal_block><paragraph>or just:</paragraph><literal_block xml:space="preserve">Terminal> doconce format format mydoc</literal_block><section ids="preprocessing" names="preprocessing"><title>Preprocessing</title><paragraph>The <literal>preprocess</literal> and <literal>mako</literal> programs are used to preprocess the file, and options to <literal>preprocess</literal> and/or <literal>mako</literal> can be added after the filename. For example:</paragraph><literal_block xml:space="preserve">Terminal> doconce format latex mydoc -Dextra_sections -DVAR1=5 # preprocess</literal_block><paragraph>The variable <literal>FORMAT</literal> is always defined as the current format when running <literal>preprocess</literal> or <literal>mako</literal>. That is, in the last example, <literal>FORMAT</literal> is defined as <literal>latex</literal>. Inside the Doconce document one can then perform format specific actions through tests like <literal>#if FORMAT == &quot;latex&quot;ot;</literal> (for <literal>preprocess</literal>) or <literal>% if FORMAT == &quot;latex&quot;:</literal> (for <literal>mako</literal>).</paragraph></section><section ids="removal-of-inline-comments" names="removal\ of\ inline\ comments"><title>Removal of inline comments</title><comment xml:space="preserve">mention notes also</comment><paragraph>The command-line arguments <literal>--no-preprocess</literal> and <literal>--no-mako</literal> turn off running <literal>preprocess</literal> and <literal>mako</literal>, respectively.</paragraph><paragraph>Inline comments in the text are removed from the output by:</paragraph><literal_block xml:space="preserve">Terminal> doconce format latex mydoc --skip_inline_comments</literal_block><paragraph>One can also remove all such comments from the original Doconce file by running:</paragraph><literal_block xml:space="preserve">Terminal> doconce remove_inline_comments mydoc</literal_block><paragraph>This action is convenient when a Doconce document reaches its final form and comments by different authors should be removed.</paragraph></section><section id="html" ids="id1"><title>HTML</title><paragraph>Making an HTML version of a Doconce file <literal>mydoc.do.txt</literal> is performed by:</paragraph><literal_block xml:space="preserve">Terminal> doconce format html mydoc</literal_block><paragraph>The resulting file <literal>mydoc.html</literal> can be loaded into any web browser for viewing.</paragraph><paragraph>The HTML style can be defined either in the header of the HTML file or in an external CSS file. The latter is enabled by the command-line argument <literal>--css=filename</literal>. There is a default style with blue headings, and a style with the <reference name="solarized" refuri="http://ethanschoonover.com/solarized">solarized</reference><target ids="solarized" names="solarized" refuri="http://ethanschoonover.com/solarized"/> color palette, specified by the <literal>--html-solarized</literal> command line argument. If there is no file with name <literal>filename</literal> in the <literal>--css=filename</literal> specification, the blue or solarized styles are written to <literal>filename</literal> and linked from the HTML document. You can provide your own style sheet either by replacing the content inside the <literal>style</literal> tags or by specifying a CSS file through the <literal>--css=filename</literal> option.</par

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**tutorial.xml**

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agraph><paragraph>If the Pygments package (including the <literal>pygmentize</literal> program) is installed, code blocks are typeset with aid of this package. The command-line argument <literal>--no-pygments-html</literal> turns off the use of Pygments and makes code blocks appear with plain (<literal>pre</literal>) HTML tags. The option <literal>--pygments-html-linenos</literal> turns on line numbers in Pygments-formatted code blocks.</paragraph><paragraph>The HTML file can be embedded in a template if the Doconce document does not have a title (because then there will be no header and footer in the HTML file). The template file must contain valid HTML code and can have three &quot;slots&quot;; <literal>%(title)s</literal> for a title, <literal>%(date)s</literal> for a date, and <literal>%(main)s</literal> for the main body of text, i.e., the Doconce document translated to HTML. The title becomes the first heading in the Doconce document, and the date is extracted from the <literal>DATE:</literal> line, if present. With the template feature one can easily embed the text in the look and feel of a website. The template can be extracted from the source code of a page at the site; just insert <literal>%(title)s</literal> and <literal>%(date)s</literal> at appropriate places and replace the main body of text by <literal>%(main)s</literal>. Here is an example:</paragraph><literal\_block xml:space="preserve">Terminal> doconce format html mydoc --html-template=mytemplate.html</literal\_block></section><section ids="blogs" names="blogs"><title>Blogs</title><paragraph>Doconce can be used for writing blogs provided the blog site accepts raw HTML code. Google's Blogger service (<literal>blogname.blogspot.com</literal>) is particularly well suited since it also allows extensive LaTeX mathematics via MathJax. Write the blog text as a Doconce document without any title, author, and date. Then generate HTML as described above. Copy the text and paste it into the text area in the blog, making sure the input format is HTML. On Google's Blogger service you can use Doconce to generate blogs with LaTeX mathematics and pretty (pygmentized) blocks of computer code. See a <reference name="blog example" refuri="http://doconce.blogspot.no">blog example</reference><target ids="blog-example" names="blog\ example" refuri="http://doconce.blogspot.no"/> for details on blogging.</paragraph><warning><paragraph>In the comments after the blog one cannot paste raw HTML code with MathJax scripts so there is no support for mathematics in the comments.</paragraph></warning><paragraph>WordPress (<literal>wordpress.com</literal>) allows raw HTML code in blogs, but has very limited LaTeX support, basically only formulas. The <literal>--wordpress</literal> option to <literal>doconce</literal> modifies the HTML code such that all equations are typeset in a way that is acceptable to WordPress. There is a <reference name="doconce example" refuri="http://doconce.wordpress.com">doconce example</reference><target ids="doconce-example" names="doconce\ example" refuri="http://doconce.wordpress.com"/> on blogging with mathematics and code on WordPress.</paragraph></section><section ids="pandoc-and-markdown" names="pandoc\ and\ markdown"><title>Pandoc and Markdown</title><paragraph>Output in Pandoc's extended Markdown format results from:</paragraph><literal\_block xml:space="preserve">Terminal> doconce format pand

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## tutorial.xml

```

oc mydoc</literal_block><paragraph>The name of the output file is <literal>mydoc
.mkd</literal>.
From this format one can go to numerous other formats:</paragraph><literal_block
xml:space="preserve">Terminal&gt; pandoc -R -t mediawiki -o mydoc.mwk --toc myd
oc.mkd</literal_block><paragraph>Pandoc supports <literal>latex</literal>, <lite
ral>html</literal>, <literal>odt</literal> (OpenOffice), <literal>docx</literal>
(Microsoft
Word), <literal>rtf</literal>, <literal>texinfo</literal>, to mention some. The
<literal>-R</literal> option makes
Pandoc pass raw HTML or LaTeX to the output format instead of ignoring it,
while the <literal>--toc</literal> option generates a table of contents.
See the <reference name="Pandoc documentation" refuri="http://johnmacfarlane.net
/pandoc/README.html">Pandoc documentation</reference><target ids="pandoc-documen
tation" names="pandoc\ documentation" refuri="http://johnmacfarlane.net/pandoc/R
EADME.html"/>
for the many features of the <literal>pandoc</literal> program.</paragraph><para
graph>Pandoc is useful to go from LaTeX mathematics to, e.g., HTML or MS Word.
There are two ways (experiment to find the best one for your document):
<literal>doconce format pandoc</literal> and then translating using <literal>pan
doc</literal>, or
<literal>doconce format latex</literal>, and then going from LaTeX to the desire
d format
using <literal>pandoc</literal>.
Here is an example on the latter strategy:</paragraph><literal_block xml:space="
preserve">Terminal&gt; doconce format latex mydoc
Terminal&gt; doconce ptex2tex mydoc
Terminal&gt; doconce replace '\Verb!' '\verb!' mydoc.tex
Terminal&gt; pandoc -f latex -t docx -o mydoc.docx mydoc.tex</literal_block><par
agraph>When we go through <literal>pandoc</literal>, only single equations or <l
iteral>align*</literal>
environments are well understood.</paragraph><paragraph>Note that Doconce applie
s the <literal>Verb</literal> macro from the <literal>fancyvrb</literal> package
while <literal>pandoc</literal> only supports the standard <literal>verb</litera
l> construction for
inline verbatim text. Moreover, quite some additional <literal>doconce
replace</literal> and <literal>doconce subst</literal> edits might be needed on
the <literal>.mkd</literal> or
<literal>.tex</literal> files to successfully have mathematics that is well tran
slated
to MS Word. Also when going to reStructuredText using Pandoc, it can
be advantageous to go via LaTeX.</paragraph><paragraph>Here is an example where
we take a Doconce snippet (without title, author,
and date), maybe with some unnumbered equations, and quickly generate
HTML with mathematics displayed my MathJax:</paragraph><literal_block xml:space="
preserve">Terminal&gt; doconce format pandoc mydoc
Terminal&gt; pandoc -t html -o mydoc.html -s --mathjax mydoc.mkd</literal_block>
<paragraph>The <literal>-s</literal> option adds a proper header and footer to t
he <literal>mydoc.html</literal> file.
This recipe is a quick way of makeing HTML notes with (some) mathematics.</parag
raph></section><section dupnames="latex" ids="id2"><title>LaTeX</title><paragrap
h>Making a LaTeX file <literal>mydoc.tex</literal> from <literal>mydoc.do.txt</l
iteral> is done in two steps:
.. Note: putting code blocks inside a list is not successful in many</paragraph>
<comment xml:space="preserve">formats - the text may be messed up. A better choi
ce is a paragraph</comment><comment xml:space="preserve">environment, as used he
re.</comment><paragraph><emphasis>Step 1.</emphasis> Filter the doconce text to
a pre-LaTeX form <literal>mydoc.p.tex</literal> for
the <literal>ptex2tex</literal> program (or <literal>doconce ptex2tex</literal>)
:</paragraph><literal_block xml:space="preserve">Terminal&gt; doconce format lat

```

## tutorial.xml

ex mydoc

LaTeX-specific commands (‘newcommands’ and ‘) in math formulas and similar can be placed in files `newcommands.tex`, `newcommands_keep.tex`, or `newcommands_replace.tex` (see the section ‘Macros (Newcommands), Cross-References, Index, and Bibliography’). If these files are present, they are included in the LaTeX document so that your commands are defined.

An option `--latex-printed` makes some adjustments for documents aimed at being printed. For example, links to web resources are associated with a footnote listing the complete web address (URL).

**Step 2.** Run `ptex2tex` (if you have it) to make a standard LaTeX file:

```
Terminal> ptex2tex mydoc
```

In case you do not have `ptex2tex`, you may run a (very) simplified version:

```
Terminal> doconce ptex2tex mydoc
```

Note that Doconce generates a `.p.tex` file with some preprocessor macros that can be used to steer certain properties of the LaTeX document. For example, to turn on the Helvetica font instead of the standard Computer Modern font, run:

```
Terminal> ptex2tex -DHELVETICA mydoc
```

```
Terminal> doconce ptex2tex mydoc -DHELVETICA # alternative
```

The title, authors, and date are by default typeset in a non-standard way to enable a nicer treatment of multiple authors having institutions in common. However, the standard LaTeX ‘maketitle’ heading is also available through `-DLATEX_HEADING=traditional`.

A separate titlepage can be generated by `-DLATEX_HEADING=titlepage`.

Preprocessor variables to be defined or undefined are:

- `BOOK` for the ‘book’ documentclass rather than the standard ‘article’ class (necessary if you apply chapter headings)
- `PALATINO` for the Palatino font
- `HELVETIA` for the Helvetica font
- `A4PAPER` for A4 paper size
- `A6PAPER` for A6 paper size (suitable for reading on small devices)
- `MOVIE15` for using the movie15 LaTeX package to display movies
- `PREAMBLE` to turn the LaTeX preamble on or off (i.e., complete document or document to be included elsewhere)
- `MINTED` for inclusion of the minted package (which requires `latex` or `pdflatex` to be run with the `-shell-escape` option)

The `ptex2tex` tool makes it possible to easily switch between many different fancy formattings of computer or verbatim code in LaTeX documents. After any `!bc` command in the Doconce source you can insert verbatim block styles as defined in your `.ptex2tex.cfg` file, e.g., `!bc sys` for a terminal session, where `sys` is set to a certain environment in `.ptex2tex.cfg` (e.g., `CodeTerminal`).

## tutorial.xml

There are about 40 styles to choose from, and you can easily add new ones.

Also the `<literal>doonce ptex2tex</literal>` command supports preprocessor directives for processing the `<literal>.p.tex</literal>` file. The command allows specifications of code environments as well. Here is an example:

```
Terminal> doonce ptex2tex mydoc -DLATEX_HEADING=traditional
\
    -DPALATINO -DA6PAPER \
    &quot;sys=\begin{quote}\begin{verbatim}@\end{verbatim}\end{quote}&quot;
; \
    fpro=minted fcod=minted shcod=Verbatim envir=ans:nt</literal_block>
<paragraph>Note that <literal>@</literal> must be used to separate the begin and end LaTeX commands, unless only the environment name is given (such as <literal>minted</literal> above, which implies <literal>\begin{minted}{fortran}</literal> and <literal>\end{minted}</literal> as begin and end for blocks inside <literal>!bc fpro</literal> and <literal>!ec</literal>). Specifying <literal>envir=ans:nt</literal> means that all other environments are typeset with the <literal>anslistings.sty</literal> package, e.g., <literal>!bc cppcod</literal> will then result in <literal>\begin{c++}</literal>. If no environments like <literal>sys</literal>, <literal>fpro</literal>, or the common <literal>envir</literal> are defined on the command line, the plain <literal>\begin{verbatim}</literal> and <literal>\end{verbatim}</literal> used.


Step 2b (optional). Edit the <literal>mydoc.tex</literal> file to your needs.



For example, you may want to substitute <literal>section</literal> by <literal>section*</literal> to avoid numbering of sections, you may want to insert linebreaks (and perhaps space) in the title, etc. This can be automatically edited with the aid of the <literal>doonce replace</literal> and <literal>doonce subst</literal> commands. The former works with substituting text directly, while the latter performs substitutions using regular expressions. Here are two examples:



```
Terminal> doonce replace 'section{' 'section*{' mydoc.tex
Terminal> doonce subst 'title\{(.+)Using (.+)\}' \
    'title{\&lt;\&lt;\&lt;\&lt; [1.5mm] Using \&lt;\&lt;\&lt;}' mydoc.tex</literal_block>
<paragraph>A lot of tailored fixes to the LaTeX document can be done by an appropriate set of text replacements and regular expression substitutions. You are anyway encouraged to make a script for generating PDF from the LaTeX file.


Step 3. Compile <literal>mydoc.tex</literal> and create the PDF file:



```
Terminal> latex mydoc
Terminal> latex mydoc
Terminal> makeindex mydoc    # if index
Terminal> bibitem mydoc      # if bibliography
Terminal> latex mydoc
Terminal> dvipdf mydoc</literal_block>
<paragraph>If one wishes to run <literal>ptex2tex</literal> and use the minted LaTeX package for typesetting code blocks (<literal>Minted_Python</literal>, <literal>Minted_Cpp</literal>, etc., in <literal>ptex2tex</literal> specified through the <literal>*pro</literal> and <l
```


```


```

## tutorial.xml

```

literal>*cod</literal> variables in
<literal>.ptex2tex.cfg</literal> or <literal>$HOME/.ptex2tex.cfg</literal>), the
  minted LaTeX package is
needed. This package is included by running <literal>ptex2tex</literal> with th
e
<literal>-DMINTED</literal> option:</paragraph><literal_block xml:space="preserv
e">Terminal&gt; ptex2tex -DMINTED mydoc</literal_block><paragraph>In this case,
<literal>latex</literal> must be run with the
<literal>-shell-escape</literal> option:</paragraph><literal_block xml:space="pr
eserve">Terminal&gt; latex -shell-escape mydoc
Terminal&gt; latex -shell-escape mydoc
Terminal&gt; makeindex mydoc      # if index
Terminal&gt; bibitem mydoc        # if bibliography
Terminal&gt; latex -shell-escape mydoc
Terminal&gt; dvipdf mydoc</literal_block><paragraph>When running <literal>doconc
e ptex2tex mydoc envirminted</literal> (or other minted
specifications with <literal>doconce ptex2tex</literal>), the minted package is
automatically
included so there is no need for the <literal>-DMINTED</literal> option.</paragr
aph></section><section ids="pdflatex" names="pdflatex"><title>PDFLaTeX</title><p
aragraph>Running <literal>pdflatex</literal> instead of <literal>latex</literal>
  follows almost the same steps,
but the start is:</paragraph><literal_block xml:space="preserve">Terminal&gt; do
conce format latex mydoc</literal_block><paragraph>Then <literal>ptex2tex</liter
al> is run as explained above, and finally:</paragraph><literal_block xml:space=
"preserve">Terminal&gt; pdflatex -shell-escape mydoc
Terminal&gt; makeindex mydoc      # if index
Terminal&gt; bibitem mydoc        # if bibliography
Terminal&gt; pdflatex -shell-escape mydoc</literal_block></section><section ids=
"plain-ascii-text" names="plain\ ascii\ text"><title>Plain ASCII Text</title><pa
ragraph>We can go from Doconce &quot;back to&quot; plain untagged text suitable
for viewing
in terminal windows, inclusion in email text, or for insertion in
computer source code:</paragraph><literal_block xml:space="preserve">Terminal&gt
; doconce format plain mydoc.do.txt  # results in mydoc.txt</literal_block></sec
tion><section dupnames="restructuredtext" ids="id3"><title>reStructuredText</tit
le><paragraph>Going from Doconce to reStructuredText gives a lot of possibilitie
s to
go to other formats. First we filter the Doconce text to a
reStructuredText file <literal>mydoc.rst</literal>:</paragraph><literal_block xm
l:space="preserve">Terminal&gt; doconce format rst mydoc.do.txt</literal_block><
paragraph>We may now produce various other formats:</paragraph><literal_block xm
l:space="preserve">Terminal&gt; rst2html.py mydoc.rst &gt; mydoc.html # html
Terminal&gt; rst2latex.py mydoc.rst &gt; mydoc.tex  # latex
Terminal&gt; rst2xml.py mydoc.rst &gt; mydoc.xml   # XML
Terminal&gt; rst2odt.py mydoc.rst &gt; mydoc.odt   # OpenOffice</literal_block>
<paragraph>The OpenOffice file <literal>mydoc.odt</literal> can be loaded into O
penOffice and
saved in, among other things, the RTF format or the Microsoft Word format.
However, it is more convenient to use the program <literal>unovonv</literal>
to convert between the many formats OpenOffice supports <em>on the command
line</em>.
Run:</paragraph><literal_block xml:space="preserve">Terminal&gt; unoconv --show<
/literal_block><paragraph>to see all the formats that are supported.
For example, the following commands take
<literal>mydoc.odt</literal> to Microsoft Office Open XML format,
classic MS Word format, and PDF:</paragraph><literal_block xml:space="preserve">
Terminal&gt; unoconv -f ooxml mydoc.odt
Terminal&gt; unoconv -f doc mydoc.odt

```

"	tutorial.xml	"
	<p>Terminal&gt; unoconv -f pdf mydoc.odt&lt;/literal_block&gt;&lt;paragraph&gt;&lt;emphasis&gt;Remark about Mathematical Typesetting.&lt;/emphasis&gt; At the time of this writing, there is no easy way to go from Doconce and LaTeX mathematics to reST and further to OpenOffice and the "MS Word world". Mathematics is only fully supported by &lt;literal&gt;latex&lt;/literal&gt; as output and to a wide extent also supported by the &lt;literal&gt;sphinx&lt;/literal&gt; output format.</p> <p>Some links for going from LaTeX to Word are listed below.&lt;/paragraph&gt;&lt;block_quote&gt;&lt;bullet_list bullet="*"&gt;&lt;list_item&gt;&lt;paragraph&gt;&lt;reference name="http://ubuntuforums.org/showthread.php?t=1033441" refuri="http://ubuntuforums.org/showthread.php?t=1033441"&gt;http://ubuntuforums.org/showthread.php?t=1033441&lt;/reference&gt;&lt;target ids="http-ubuntuforums-org-showthread-php-t-1033441" names="http://ubuntuforums.org/showthread.php?t=1033441" refuri="http://ubuntuforums.org/showthread.php?t=1033441"/&gt;&lt;/paragraph&gt;&lt;/list_item&gt;&lt;list_item&gt;&lt;paragraph&gt;&lt;reference name="http://tug.org/utilities/texconv/textopc.html" refuri="http://tug.org/utilities/texconv/textopc.html"&gt;http://tug.org/utilities/texconv/textopc.html&lt;/reference&gt;&lt;target ids="http-tug-org-utilites-texconv-textopc-html" names="http://tug.org/utilities/texconv/textopc.html" refuri="http://tug.org/utilities/texconv/textopc.html"/&gt;&lt;/paragraph&gt;&lt;/list_item&gt;&lt;list_item&gt;&lt;paragraph&gt;&lt;reference name="http://nileshbansal.blogspot.com/2007/12/latex-to-openofficeword.html" refuri="http://nileshbansal.blogspot.com/2007/12/latex-to-openofficeword.html"&gt;http://nileshbansal.blogspot.com/2007/12/latex-to-openofficeword.html&lt;/reference&gt;&lt;target ids="http-nileshbansal-blogspot-com-2007-12-latex-to-openofficeword-html" names="http://nileshbansal.blogspot.com/2007/12/latex-to-openofficeword.html" refuri="http://nileshbansal.blogspot.com/2007/12/latex-to-openofficeword.html"/&gt;&lt;/paragraph&gt;&lt;/list_item&gt;&lt;/bullet_list&gt;&lt;/block_quote&gt;&lt;/section&gt;&lt;section dupnames="sphinx" ids="id4"&gt;&lt;title&gt;Sphinx&lt;/title&gt;&lt;paragraph&gt;Sphinx documents demand quite some steps in their creation. We have automated most of the steps through the &lt;literal&gt;doconce sphinx_dir&lt;/literal&gt; command:&lt;/paragraph&gt;&lt;literal_block xml:space="preserve"&gt;Terminal&gt; doconce sphinx_dir author=&amp;quot;authors' names&amp;quot; \ title=&amp;quot;some title&amp;quot; version=1.0 dirname=sphinxdir \ theme=mytheme file1 file2 file3 ...&lt;/literal_block&gt;&lt;paragraph&gt;The keywords &lt;literal&gt;author&lt;/literal&gt;, &lt;literal&gt;title&lt;/literal&gt;, and &lt;literal&gt;version&lt;/literal&gt; are used in the headings of the Sphinx document. By default, &lt;literal&gt;version&lt;/literal&gt; is 1.0 and the script will try to deduce authors and title from the doconce files &lt;literal&gt;file1&lt;/literal&gt;, &lt;literal&gt;file2&lt;/literal&gt;, etc. that together represent the whole document. Note that none of the individual Doconce files &lt;literal&gt;file1&lt;/literal&gt;, &lt;literal&gt;file2&lt;/literal&gt;, etc. should include the rest as their union makes up the whole document. The default value of &lt;literal&gt;dirname&lt;/literal&gt; is &lt;literal&gt;sphinx-rootdir&lt;/literal&gt;. The &lt;literal&gt;theme&lt;/literal&gt; keyword is used to set the theme for design of HTML output from Sphinx (the default theme is &lt;literal&gt;'default'&lt;/literal&gt;).&lt;/paragraph&gt;&lt;paragraph&gt;With a single-file document in &lt;literal&gt;mydoc.do.txt&lt;/literal&gt; one often just runs:&lt;/paragraph&gt;&lt;literal_block xml:space="preserve"&gt;Terminal&gt; doconce sphinx_dir mydoc&lt;/literal_block&gt;&lt;paragraph&gt;and then an appropriate Sphinx directory &lt;literal&gt;sphinx-rootdir&lt;/literal&gt; is made with relevant files.&lt;/paragraph&gt;&lt;paragraph&gt;The &lt;literal&gt;doconce sphinx_dir&lt;/literal&gt; command generates a script &lt;literal&gt;automake_sphinx.py&lt;/literal&gt; for compiling the Sphinx document into an HTML document. One can either run &lt;literal&gt;automake_sphinx.py&lt;/literal&gt; or perform the</p>	

” **tutorial.xml** ”

steps in the script manually, possibly with necessary modifications. You should at least read the script prior to executing it to have some idea of what is done.

The `doonce sphinx_dir` script copies directories named `figs` or `figures` over to the Sphinx directory so that figures are accessible in the Sphinx compilation. If figures or movies are located in other directories, `automake_sphinx.py` must be edited accordingly. Files, to which there are local links (not `http:` or `file:` URLs), must be placed in the `_static` subdirectory of the Sphinx directory. The utility `doonce sphinxfix_localURLs` is run to check for local links in the Doonce file: for each such link, say `dir1/dir2/myfile.txt` it replaces the link by `_static/myfile.txt` and copies `dir1/dir2/myfile.txt` to a local `_static` directory (in the same directory as the script is run). However, we recommend instead that the writer of the document places files in `_static` or lets a script do it automatically. The user must copy all `_static/*` files to the `_static` subdirectory of the Sphinx directory. It may be wise to always put files, to which there are local links in the Doonce document, in a `_static` or `_static-name` directory and use these local links. Then links do not need to be modified when creating a Sphinx version of the document.

Doonce comes with a collection of HTML themes for Sphinx documents. These are packed out in the Sphinx directory, the `conf.py` configuration file for Sphinx is edited accordingly, and a script `make-themes.sh` can make HTML documents with one or more themes. For example, to realize the themes `fenics` and `pyramid`, one writes:

```
Terminal> ./make-themes.sh fenics pyramid
```

The resulting directories with HTML documents are `_build/html_fenics` and `_build/html_pyramid`, respectively. Without arguments, `make-themes.sh` makes all available themes (!).

If it is not desirable to use the autogenerated scripts explained above, here is the complete manual procedure of generating a Sphinx document from a file `mydoc.do.txt`.

**Step 1.** Translate Doonce into the Sphinx format:

```
Terminal> doonce format sphinx mydoc
```

**Step 2.** Create a Sphinx root directory either manually or by using the interactive `sphinx-quickstart` program. Here is a scripted version of the steps with the latter:

```
mkdir sphinx-rootdir
sphinx-quickstart &&& EOF
sphinx-rootdir
n
```

— Name of My Sphinx Document

”

**tutorial.xml**

”

Author  
version  
version  
.rst  
index

n  
y  
n  
n  
n  
y  
n  
n  
y  
y  
y

EOF</literal\_block><paragraph>The autogenerated <literal>conf.py</literal> file may need some edits if you want to specific layout (Sphinx themes) of HTML pages. The <literal>doconce sphinx\_dir</literal> generator makes an extended <literal>conv.py</literal>

file where, among other things, several useful Sphinx extensions are included.</paragraph><paragraph><emphasis>Step 3.</emphasis> Copy the <literal>mydoc.rst</literal> file to the Sphinx root directory:</paragraph><literal\_block xml:space="preserve">Terminal> cp mydoc.rst sphinx-rootdir</literal\_block><paragraph>If you have figures in your document, the relative paths to those will

be invalid when you work with <literal>mydoc.rst</literal> in the <literal>sphinx-rootdir</literal>

directory. Either edit <literal>mydoc.rst</literal> so that figure file paths are correct,

or simply copy your figure directories to <literal>sphinx-rootdir</literal>. Links to local files in <literal>mydoc.rst</literal> must be modified to links to

files in the <literal>\_static</literal> directory, see comment above.</paragraph><paragraph><emphasis>Step 4.</emphasis> Edit the generated <literal>index.rst</literal> file so that <literal>mydoc.rst</literal>

is included, i.e., add <literal>mydoc</literal> to the <literal>toctree</literal> section so that it becomes:</paragraph><literal\_block xml:space="preserve">..

toctree::  
    :maxdepth: 2

mydoc</literal\_block><paragraph>(The spaces before <literal>mydoc</literal> are important!)</paragraph><paragraph><emphasis>Step 5.</emphasis> Generate, for instance, an HTML version of the Sphinx source:</paragraph><literal\_block xml:space="preserve">make clean # remove old versions

make html</literal\_block><paragraph>Sphinx can generate a range of different formats: standalone HTML, HTML in separate directories with <literal>index.html</literal> files,

a large single HTML file, JSON files, various help files (the qthelp, HTML, and Devhelp projects), epub, LaTeX, PDF (via LaTeX), pure text, man pages, and Texinfo files.</paragraph><paragraph><emphasis>Step 6.</emphasis> View the result:</paragraph><literal\_block xml:space="preserve">Terminal> firefox \_build/html/index.html</literal\_block><paragraph>Note that verbatim code blocks can be typeset in a variety of ways

depending the argument that follows <literal>!bc</literal>: <literal>cod</literal> gives Python

(<literal>code-block:: python</literal> in Sphinx syntax) and <literal>cppcod</literal>

”

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## tutorial.xml

```

literal> gives C++, but
all such arguments can be customized both for Sphinx and LaTeX output.</paragrap
h></section><section ids="wiki-formats" names="wiki\ formats"><title>Wiki Format
s</title><paragraph>There are many different wiki formats, but Doconce only supp
orts three:
<reference name="Googlecode wiki" refuri="http://code.google.com/p/support/wiki/
WikiSyntax">Googlecode wiki</reference><target ids="googlecode-wiki" names="goog
lecode\ wiki" refuri="http://code.google.com/p/support/wiki/WikiSyntax"/>,
<reference name="MediaWiki" refuri="http://www.mediawiki.org/wiki/Help:Formattin
g">MediaWiki</reference><target ids="mediawiki" names="mediawiki" refuri="http:/
/www.mediawiki.org/wiki/Help:Formatting"/>, and
<reference name="Creole Wiki" refuri="http://www.wikicreole.org/wiki/Creole1.0">
Creole Wiki</reference><target ids="creole-wiki" names="creole\ wiki" refuri="ht
tp://www.wikicreole.org/wiki/Creole1.0"/>.
These formats are called
<literal>gwiki</literal>, <literal>mwiki</literal>, and <literal>cwiki</literal>
, respectively.
Transformation from Doconce to these formats is done by:</paragraph><literal_blo
ck xml:space="preserve">Terminal> doconce format gwiki mydoc.do.txt
Terminal> doconce format mwiki mydoc.do.txt
Terminal> doconce format cwiki mydoc.do.txt</literal_block><paragraph>The pro
duced MediaWiki can be tested in the <reference name="sandbox of wikibooks.org"
refuri="http://en.wikibooks.org/wiki/Sandbox">sandbox of
wikibooks.org</reference><target ids="sandbox-of-wikibooks-org" names="sandbox\
of\ wikibooks.org" refuri="http://en.wikibooks.org/wiki/Sandbox"/>. The format
works well with Wikipedia, Wikibooks, and
<reference name="ShoutWiki" refuri="http://doconcedemo.shoutwiki.com/wiki/Doconc
e_demo_page">ShoutWiki</reference><target ids="shoutwiki" names="shoutwiki" refu
ri="http://doconcedemo.shoutwiki.com/wiki/Doconce_demo_page"/>,
but not always well elsewhere
(see <reference name="this example" refuri="http://doconcedemo.jumpwiki.com/wiki
/First_demo">this example</reference><target ids="this-example" names="this\ exa
mple" refuri="http://doconcedemo.jumpwiki.com/wiki/First_demo"/>).</paragraph><p
aragraph>Large MediaWiki documents can be made with the
<reference name="Book creator" refuri="http://en.wikipedia.org/w/index.php?title
=Special:Book&bookcmd=book_creator">Book creator</reference><target ids="boo
k-creator" names="book\ creator" refuri="http://en.wikipedia.org/w/index.php?tit
le=Special:Book&bookcmd=book_creator"/>.
From the MediaWiki format one can go to other formats with aid
of <reference name="mwlib" refuri="http://pediapress.com/code/">mwlib</reference
><target ids="mwlib" names="mwlib" refuri="http://pediapress.com/code/">. This
means that one can
easily use Doconce to write <reference name="Wikibooks" refuri="http://en.wikibo
oks.org">Wikibooks</reference><target ids="wikibooks" names="wikibooks" refuri="
http://en.wikibooks.org"/>
and publish these in PDF and MediaWiki format, while
at the same time, the book can also be published as a
standard LaTeX book, a Sphinx web document, or a collection of HTML files.</para
graph><paragraph>The Googlecode wiki document, <literal>mydoc.gwiki</literal>, i
s most conveniently stored
in a directory which is a clone of the wiki part of the Googlecode project.
This is far easier than copying and pasting the entire text into the
wiki editor in a web browser.</paragraph><paragraph>When the Doconce file contain
s figures, each figure filename must in
the <literal>.gwiki</literal> file be replaced by a URL where the figure is
available. There are instructions in the file for doing this. Usually,
one performs this substitution automatically (see next section).</paragraph></se
ction><section ids="tweaking-the-doconce-output" names="tweaking\ the\ doconce\
output"><title>Tweaking the Doconce Output</title><paragraph>Occasionally, one w

```

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**tutorial.xml**

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ould like to tweak the output in a certain format from Doconce. One example is figure filenames when transforming Doconce to reStructuredText. Since Doconce does not know if the `<literal>.rst</literal>` file is going to be filtered to LaTeX or HTML, it cannot know if `<literal>.eps</literal>` or `<literal>.png</literal>` is the most appropriate image filename.

The solution is to use a text substitution command or code with, e.g., sed, perl, python, or scitools subst, to automatically edit the output file from Doconce. It is then wise to run Doconce and the editing commands from a script to automate all steps in going from Doconce to the final format(s). The `<literal>make.sh</literal>` files in `<literal>docs/manual</literal>` and `<literal>docs/tutorial</literal>` constitute comprehensive examples on how such scripts can be made.

</section><section ids="demos" names="demos"><title>Demos</title><paragraph>The current text is generated from a Doconce format stored in the file:</paragraph><literal\_block xml:space="preserve">docs/tutorial/tutorial.do.txt</literal\_block><paragraph>The file `<literal>make.sh</literal>` in the `<literal>tutorial</literal>` directory of the Doconce source code contains a demo of how to produce a variety of formats. The source of this tutorial, `<literal>tutorial.do.txt</literal>` is the starting point. Running `<literal>make.sh</literal>` and studying the various generated files and comparing them with the original `<literal>tutorial.do.txt</literal>` file, gives a quick introduction to how Doconce is used in a real case.

<reference name="Here" refuri="https://doconce.googlecode.com/hg/doc/demos/tutorial/index.html">Here</reference><target ids="here" names="here" refuri="https://doconce.googlecode.com/hg/doc/demos/tutorial/index.html"/>

is a sample of how this tutorial looks in different formats.</paragraph><paragraph>There is another demo in the `<literal>docs/manual</literal>` directory which translates the more comprehensive documentation, `<literal>manual.do.txt</literal>`, to various formats. The `<literal>make.sh</literal>` script runs a set of translations.</paragraph></section></section><section ids="installation-of-doconce-and-its-dependencies" names="installation\ of\ doconce\ and\ its\ dependencies"><title>Installation of Doconce and its Dependencies</title><section ids="doconce" names="doconce"><title>Doconce</title><paragraph>Doconce itself is pure Python code hosted at <reference name="http://code.google.com/p/doconce" refuri="http://code.google.com/p/doconce">http://code.google.com/p/doconce</reference><target ids="http-code-google-com-p-doconce" names="http://code.google.com/p/doconce" refuri="http://code.google.com/p/doconce"/>. Its installation from the Mercurial (`<literal>hg</literal>`) source follows the standard procedure:</paragraph><literal\_block xml:space="preserve"># Doconce  
hg clone https://code.google.com/p/doconce/ doconce  
cd doconce  
sudo python setup.py install  
cd ..</literal\_block><paragraph>Since Doconce is frequently updated, it is recommended to use the above procedure and whenever a problem occurs, make sure to update to the most recent version:</paragraph><literal\_block xml:space="preserve">cd doconce  
hg pull  
hg update  
sudo python setup.py install</literal\_block><paragraph>Debian GNU/Linux users can also run:</paragraph><literal\_block xml:space="preserve">sudo apt-get install doconce</literal\_block><paragraph>This installs the latest release and not the most updated and bugfixed version.

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"	tutorial.xml	"
	<p>On Ubuntu one needs to run:&lt;/paragraph&gt;&lt;literal_block xml:space="preserve"&gt;sudo add-apt-repository ppa:scitools/ppa sudo apt-get update sudo apt-get install doconce&lt;/literal_block&gt;&lt;/section&gt;&lt;section ids="dependencies" names="dependencies"&gt;&lt;title&gt;Dependencies&lt;/title&gt;&lt;section ids="preprocessors" names="preprocessors"&gt;&lt;title&gt;Preprocessors&lt;/title&gt;&lt;paragraph&gt;If you make use of the &lt;reference name="Preprocess" refuri="http://code.google.com/p/preprocess"&gt;Preprocess&lt;/reference&gt;&lt;target ids="preprocess" names="preprocess" refuri="http://code.google.com/p/preprocess"/&gt; preprocessor, this program must be installed:&lt;/paragraph&gt;&lt;literal_block xml:space="preserve"&gt;svn checkout http://preprocess.googlecode.com/svn/trunk/ preprocess cd preprocess cd doconce sudo python setup.py install cd ..&lt;/literal_block&gt;&lt;paragraph&gt;A much more advanced alternative to Preprocess is</p> <p>&lt;reference name="Mako" refuri="http://www.makotemplates.org"&gt;Mako&lt;/reference&gt;&lt;target ids="mako" names="mako" refuri="http://www.makotemplates.org"/&gt;. Its installation is most conveniently done by &lt;literal&gt;pip&lt;/literal&gt;:&lt;/paragraph&gt;&lt;literal_block xml:space="preserve"&gt;pip install Mako&lt;/literal_block&gt;&lt;paragraph&gt;This command requires &lt;literal&gt;pip&lt;/literal&gt; to be installed. On Debian Linux systems, such as Ubuntu, the installation is simply done by:&lt;/paragraph&gt;&lt;literal_block xml:space="preserve"&gt;sudo apt-get install python-pip&lt;/literal_block&gt;&lt;paragraph&gt;Alternatively, one can install from the &lt;literal&gt;pip&lt;/literal&gt; &lt;reference name="source code" refuri="http://pypi.python.org/pypi/pip"&gt;source code&lt;/reference&gt;&lt;target ids="source-code" names="source\ code" refuri="http://pypi.python.org/pypi/pip"/&gt;.&lt;/paragraph&gt;&lt;paragraph&gt;Mako can also be installed directly from &lt;reference name="source" refuri="http://www.makotemplates.org/download.html"&gt;source&lt;/reference&gt;&lt;target ids="source" names="source" refuri="http://www.makotemplates.org/download.html"/&gt;: download the tarball, pack it out, go to the directory and run the usual &lt;literal&gt;sudo python setup.py install&lt;/literal&gt;.&lt;/paragraph&gt;&lt;/section&gt;&lt;section ids="image-file-handling" names="image\ file\ handling"&gt;&lt;title&gt;Image file handling&lt;/title&gt;&lt;paragraph&gt;Different output formats require different formats of image files. For example, PostScript or Encapsulated PostScript is required for &lt;literal&gt;latex&lt;/literal&gt; output, while HTML needs JPEG, GIF, or PNG formats. Doconce calls up programs from the ImageMagick suite for converting image files to a proper format if needed. The &lt;reference name="ImageMagick suite" refuri="http://www.imagemagick.org/script/index.php"&gt;ImageMagick suite&lt;/reference&gt;&lt;target ids="imagemagick-suite" names="imagemagick\ suite" refuri="http://www.imagemagick.org/script/index.php"/&gt; can be installed on all major platforms. On Debian Linux (including Ubuntu) systems one can simply write:&lt;/paragraph&gt;&lt;literal_block xml:space="preserve"&gt;sudo apt-get install imagemagick&lt;/literal_block&gt;&lt;paragraph&gt;The convenience program &lt;literal&gt;doconce combine_images&lt;/literal&gt;, for combining several images into one, will use &lt;literal&gt;montage&lt;/literal&gt; and &lt;literal&gt;convert&lt;/literal&gt; from ImageMagick and the &lt;literal&gt;pdftk&lt;/literal&gt;, &lt;literal&gt;pdfnup&lt;/literal&gt;, and &lt;literal&gt;pdfcrop&lt;/literal&gt; programs from the &lt;literal&gt;texlive-extra-utils&lt;/literal&gt; Debian package. The latter gets installed by:&lt;/paragraph&gt;&lt;literal_block xml:space="preserve"&gt;sudo apt-get install texlive-extra-utils&lt;/literal_block&gt;&lt;/section&gt;&lt;section ids="spellcheck" names="spellcheck"&gt;&lt;title&gt;Spellcheck&lt;/title&gt;&lt;paragraph&gt;The utility &lt;literal&gt;doconce spellcheck&lt;/literal&gt; applies the &lt;literal&gt;ispell&lt;/literal&gt; program for spellcheck. On Debian (including Ubuntu) it is installed by:&lt;/paragraph&gt;&lt;literal_block xml:space="preserve"&gt;sudo apt-get install ispell&lt;/literal_block&gt;&lt;/section&gt;</p>	

"	tutorial.xml	"
	<pre> &gt;&lt;section ids="ptex2tex-for-latex-output" names="ptex2tex\ for\ latex\ output"&gt;&lt; title&gt;Ptex2tex for LaTeX Output&lt;/title&gt;&lt;paragraph&gt;To make LaTeX documents with v ery flexible choice of typesetting of verbatim code blocks you need &lt;reference name="ptex2tex" refuri="http://code.goo gle.com/p/ptex2tex"&gt;ptex2tex&lt;/reference&gt;&lt;target ids="ptex2tex" names="ptex2tex" refuri="http://code.google.com/p/ptex2tex"/&gt;, which is installed by:&lt;/paragraph&gt;&lt;literal_block xml:space="preserve"&gt;svn checko ut http://ptex2tex.googlecode.com/svn/trunk/ ptex2tex cd ptex2tex sudo python setup.py install&lt;/literal_block&gt;&lt;paragraph&gt;It may happen that you ne ed additional style files, you can run a script, &lt;literal&gt;cp2texmf.sh&lt;/literal&gt;:&lt;/paragraph&gt;&lt;literal_block xml:space="p reserve"&gt;cd latex sh cp2texmf.sh # copy stylefiles to ~/texmf directory cd ../../&lt;/literal_block&gt;&lt;paragraph&gt;This script copies some special stylefiles th at that &lt;literal&gt;ptex2tex&lt;/literal&gt; potentially makes use of. Some more standard st ylefiles are also needed. These are installed by:&lt;/paragraph&gt;&lt;literal_block xml:space="pr eserve"&gt;sudo apt-get install texlive-latex-recommended texlive-latex-extra&lt;/lite ral_block&gt;&lt;paragraph&gt;on Debian Linux (including Ubuntu) systems. TeXShop on Mac comes with the necessary stylefiles (if not, they can be found by googling and installed manually in the &lt;literal&gt;~/texmf/tex/latex/misc&lt;/literal&gt; directory).&lt;/paragraph&gt; &lt;paragraph&gt;Note that the &lt;literal&gt;doconce ptex2tex&lt;/literal&gt; command, which nee ds no installation beyond Doconce itself, can be used as a simpler alternative to the &lt;literal&gt;ptex 2tex&lt;/literal&gt; program.&lt;/paragraph&gt;&lt;paragraph&gt;The &lt;emphasis&gt;minted&lt;/emphasis&gt; LaTeX style is of fered by &lt;literal&gt;ptex2tex&lt;/literal&gt; and &lt;literal&gt;doconce ptext2tex&lt;/literal&gt; and popular among many users. This style requires the package &lt;reference name="Pygments" refuri="http:/ /pygments.org"&gt;Pygments&lt;/reference&gt;&lt;target ids="pygments" names="pygments" refur i="http://pygments.org"/&gt; to be installed. On Debian Linux:&lt;/paragraph&gt;&lt;literal_block xml:space="preserve" &gt;sudo apt-get install python-pygments&lt;/literal_block&gt;&lt;paragraph&gt;Alternatively, t he package can be installed manually:&lt;/paragraph&gt;&lt;literal_block xml:space="prese rve"&gt;hg clone ssh://hg@bitbucket.org/birkenfeld/pygments-main pygments cd pygments sudo python setup.py install&lt;/literal_block&gt;&lt;paragraph&gt;If you use the minted sty le together with &lt;literal&gt;ptex2tex&lt;/literal&gt;, you have to enable it by the &lt;literal&gt;-DMINTED&lt;/literal&gt; command-line argument to &lt;literal&gt;p tex2tex&lt;/literal&gt;. This is not necessary if you run the alternative &lt;literal&gt;doconce ptex2tex&lt;/lite ral&gt; program.&lt;/paragraph&gt;&lt;paragraph&gt;All use of the minted style requires the &lt;literal&gt;-shell-escape&lt;/literal&gt; command-li ne argument when running LaTeX, i.e., &lt;literal&gt;latex -shell-escape&lt;/literal&gt; or &lt;li teral&gt;pdflatex -shell-escape&lt;/literal&gt;.&lt;/paragraph&gt;&lt;comment xml:space="preserve"&gt;Say something about anslistings.sty&lt;/comment&gt;&lt;/section&gt;&lt;section ids="restructuredtext-rest-out put" names="restructuredtext\ (rest)\ output"&gt;&lt;title&gt;reStructuredText (reST) Out put&lt;/title&gt;&lt;paragraph&gt;The &lt;literal&gt;rst&lt;/literal&gt; output from Doconce allows furt her transformation to LaTeX, HTML, XML, OpenOffice, and so on, through the &lt;reference name="docutils" refuri= "http://docutils.sourceforge.net"&gt;docutils&lt;/reference&gt;&lt;target ids="docutils" nam es="docutils" refuri="http://docutils.sourceforge.net"/&gt; package. The installat ion of the most recent version can be done by:&lt;/paragraph&gt;&lt;literal_block xml:space="preserv </pre>	

## tutorial.xml

```
e">svn checkout http://docutils.svn.sourceforge.net/svnroot/docutils/trunk/docutils
cd docutils
sudo python setup.py install
cd ..</literal_block><paragraph>To use the OpenOffice suite you will typically on Debian systems install:</paragraph><literal_block xml:space="preserve">sudo apt-get install unovonv libreoffice libreoffice-dmaths</literal_block><paragraph>There is a possibility to create PDF files from reST documents using ReportLab instead of LaTeX. The enabling software is <reference name="rst2pdf" refuri="http://code.google.com/p/rst2pdf">rst2pdf</reference><target ids="rst2pdf" names="rst2pdf" refuri="http://code.google.com/p/rst2pdf"/>. Either download the tarball or clone the svn repository, go to the <literal>rst2pdf</literal> directory and run the usual <literal>sudo python setup.py install</literal>.</paragraph><paragraph>Output to <literal>sphinx</literal> requires of course the <reference name="Sphinx software" refuri="http://sphinx.pocoo.org">Sphinx software</reference><target ids="sphinx-software" names="sphinx\ software" refuri="http://sphinx.pocoo.org"/>, installed by:</paragraph><literal_block xml:space="preserve">hg clone https://bitbucket.org/birkenfeld/sphinx</literal_block>
cd sphinx
sudo python setup.py install
cd ..</literal_block></section><section ids="markdown-and-pandoc-output" names="markdown\ and\ pandoc\ output"><title>Markdown and Pandoc Output</title><paragraph>The Doconce format <literal>pandoc</literal> outputs the document in the Pandoc extended Markdown format, which via the <literal>pandoc</literal> program can be translated to a range of other formats. Installation of <reference name="Pandoc" refuri="http://johnmacfarlane.net/pandoc/">Pandoc</reference><target ids="pandoc" names="pandoc" refuri="http://johnmacfarlane.net/pandoc/">, written in Haskell, is most easily done by:</paragraph><literal_block xml:space="preserve">sudo apt-get install pandoc</literal_block><paragraph>on Debian (Ubuntu) systems.</paragraph></section><section ids="epydoc-output" names="epydoc\ output"><title>Epydoc Output</title><paragraph>When the output format is <literal>epydoc</literal> one needs that program too, installed by:</paragraph><literal_block xml:space="preserve">svn co https://epydoc.svn.sourceforge.net/svnroot/epydoc/trunk/epydoc epydoc</literal_block>
cd epydoc
sudo make install
cd ..</literal_block><paragraph><emphasis>Remark.</emphasis> Several of the packages above installed from source code are also available in Debian-based system through the <literal>apt-get install</literal> command. However, we recommend installation directly from the version control system repository as there might be important updates and bug fixes. For <literal>svn</literal> directories, go to the directory, run <literal>svn update</literal>, and then <literal>sudo python setup.py install</literal>. For Mercurial (<literal>hg</literal>) directories, go to the directory, run <literal>hg pull; hg update</literal>, and then <literal>sudo python setup.py install</literal>.</paragraph></section></section></section></document>
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