



How to use

**rst2pdf**

Version 0.100 (final)

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# 1 Introduction

This document explains how to use `rst2pdf`. Here is the very short version:

```
rst2pdf.py mydocument.txt -o mydocument.pdf
```

That will, as long as `mydocument.txt` is a valid reStructured Text (rST) document, produce a file called `mydocument.pdf` which is a PDF version of your document.

Of course, that means you just used default styles and settings. If it looks good enough for you, then you may stop reading this document, because you are done with it. If you are reading this in a PDF, it was generated using those default settings.

However, if you want to customize the output, or are just curious to see what can be done, let's continue.

## 1.1 Related Reading

As well as the `rst2pdf`-specific features described in this manual, you may also find it useful to refer to the ReStructuredText manual and information about its directives:

- A ReStructuredText Primer: <https://docutils.sourceforge.io/docs/user/rst/quickstart.html>
- Quick ReStructuredText: <https://docutils.sourceforge.io/docs/user/rst/quickref.html>
- ReStructuredText Specification: <https://docutils.sourceforge.io/docs/ref/rst/restructuredtext.html>
- ReStructuredText Directives: <https://docutils.sourceforge.io/docs/ref/rst/directives.html>

## 2 Command line options

<code>-h, --help</code>	Show this help message and exit
<code>--config=FILE</code>	Config file to use. Default= <code>~/rst2pdf/config</code>
<code>-o FILE, --output=FILE</code>	Write the PDF to FILE
<code>-s STYLESHEETS, --stylesheets=STYLESHEETS</code>	A comma-separated list of custom stylesheets. Default=""
<code>--stylesheet-path=FOLDERLIST</code>	A colon-separated list of folders to search for stylesheets. Default=""
<code>-c, --compressed</code>	Create a compressed PDF. Default=False
<code>--print-stylesheet</code>	Print the default stylesheet and exit
<code>--font-folder=FOLDER</code>	Search this folder for fonts. (Deprecated)
<code>--font-path=FOLDERLIST</code>	A colon-separated list of folders to search for fonts. Default=""
<code>--baseurl=URL</code>	The base URL for relative URLs.
<code>-l LANG, --language=LANG</code>	Language to be used for hyphenation and docutils localization. Default=None
<code>--header=HEADER</code>	Page header if not specified in the document.
<code>--footer=FOOTER</code>	Page footer if not specified in the document.
<code>--section-header-depth=N</code>	Sections up to this dept will be used in the header and footer's replacement of <code>###Section###</code> . Default=2
<code>--smart-quotes=VALUE</code>	Try to convert ASCII quotes, ellipsis and dashes to the typographically correct equivalent. Default=0

The possible values are:

1. Suppress all transformations. (Do nothing.)
2. Performs default SmartyPants transformations: quotes (including backticks-style), em-dashes, and ellipses. "--" (dash dash) is used to signify an em-dash; there is no support for en-dashes.
3. Same as `--smart-quotes=1`, except that it uses the old-school typewriter shorthand for dashes: "--" (dash dash) for en-dashes, "---" (dash dash dash) for em-dashes.
4. Same as `--smart-quotes=2`, but inverts the shorthand for dashes: "--" (dash dash) for em-dashes, and "---" (dash dash dash) for en-dashes.

<code>--fit-literal-mode=MODE</code>	What to do when a literal is too wide. One of error,overflow,shrink,truncate. Default="shrink"
<code>--fit-background-mode=MODE</code>	How to fit the background image to the page. One of scale, scale_width or center. Default="center"
<code>--inline-links</code>	Shows target between parenthesis instead of active link
<code>--repeat-table-rows</code>	Repeats header row for each splitted table
<code>--raw-html</code>	Support embeddig raw HTML. Default: False
<code>-q, --quiet</code>	Print less information.
<code>-v, --verbose</code>	Print debug information.
<code>--very-verbose</code>	Print even more debug information.
<code>--version</code>	Print version number and exit.
<code>--no-footnote-backlinks</code>	Disable footnote backlinks. Default: False
<code>--inline-footnotes</code>	Show footnotes inline. Default: True
<code>--default-dpi=NUMBER</code>	DPI for objects sized in pixels. Default=300

<code>--show-frame-boundary</code>	Show frame borders (only useful for debugging). Default=False
<code>--disable-splittables</code>	Don't use splittable flowables in some elements. Only try this if you can't process a document any other way.
<code>-b LEVEL, --break-level=LEVEL</code>	Maximum section level that starts in a new page. Default: 0

**--first-page-on-right When using double sided pages, the first page will start**

on the right hand side. (Book Style)

<code>--blank-first-page</code>	Add a blank page at the beginning of the document.
<code>--break-side=VALUE</code>	How section breaks work. Can be "even", and sections start in an even page,"odd", and sections start in odd pages, or "any" and sections start in the next page,be it even or odd. See also the -b option.
<code>--date-invariant</code>	Don't store the current date in the PDF. Useful mainly for the test suite, where we don't want the PDFs to change.
<code>-e EXTENSIONS</code>	Alias for --extension-module
<code>--extension-module=EXTENSIONS</code>	Add a helper extension module to this invocation of rst2pdf (module must end in .py and be on the python path)
<code>--custom-cover=FILE</code>	Template file used for the cover page. Default: cover.tpl
<code>--use-floating-images</code>	Makes images with :align: attribute work more like in rst2html. Default: False
<code>--use-numbered-links</code>	When using numbered sections, adds the numbers to all links referring to the section headers. Default: False
<code>--strip-elements-with-class=CLASS</code>	Remove elements with this CLASS from the output. Can be used multiple times.
<code>--record-dependencies=FILE</code>	Write output file dependencies to FILE.

## 3 Configuration File

Since version 0.8, rst2pdf will read (if it is available) configuration files in `/etc/rst2pdf.conf` and `~/.rst2pdf/config`.

The user's file at `~/.rst2pdf/config` will have priority over the system's at `/etc/rst2pdf.conf` <sup>1</sup>

Here's an example file showing some of the currently available options:

```
# This is an example config file. Modify and place in ~/.rst2pdf/config
```

### **[general]**

```
# A comma-separated list of custom stylesheets. Example:
```

```
# stylesheets="fruity.json,a4paper.json,verasans.json"
```

```
stylesheets=""
```

```
# Create a compressed PDF
```

```
# Use true/false (lower case) or 1/0
```

```
compressed=false
```

```
# A colon-separated list of folders to search for fonts. Example:
```

```
# font_path="/usr/share/fonts:/usr/share/texmf-dist/fonts/"
```

```
font_path=""
```

```
# A colon-separated list of folders to search for stylesheets. Example:
```

```
# stylesheet_path="~/styles:/usr/share/styles"
```

```
stylesheet_path=""
```

```
# Language to be used for hyphenation support
```

```
language="en_US"
```

```
# Default page header and footer
```

```
header=null
```

```
footer=null
```

```
# What to do if a literal block is too large. Can be
```

```
# shrink/truncate/overflow
```

```
fit_mode="shrink"
```

```
# How to adjust the background image to the page.
```

```
# Can be: "scale" and "center"
```

```
fit_background_mode="center"
```

```
# What is the maximum level of heading that starts in a new page.
```

```
# 0 means no level starts in a new page.
```

```
break_level=0
```

```
# How section breaks work. Can be "even", and sections start in an
```

```
# even page, "odd", and sections start in odd pages, or "any" and
```

```
# sections start in the next page, be it even or odd.
```

```
break_side="any"

# Add a blank page at the beginning of the document

blank_first_page=false

# Treat the first page as even (default false, treat it as odd)

first_page_even=false

# Smart quotes.
# 0: Suppress all transformations. (Do nothing.)
# 1: Performs default SmartyPants transformations: quotes (including ``backticks``
# -style), em-dashes, and ellipses. "--" (dash dash) is used to signify an em-dash;
# there is no support for en-dashes.
# 2: Same as 1, except that it uses the old-school typewriter shorthand for
# dashes: "--" (dash dash) for en-dashes, "---" (dash dash dash) for em-dashes.
# 3: Same as 2, but inverts the shorthand for dashes: "--" (dash dash) for
# em-dashes, and "---" (dash dash dash) for en-dashes.

smartquotes=0

# Footnote backlinks enabled or not (default: enabled)

footnote_backlinks=true

# Show footnotes inline instead of at the end of the document

inline_footnotes=false

# Cover page template.
# It will be searched in the document's folder, in ~/.rst2pdf/templates and
# in the templates subfolder of the package folder

# custom_cover = cover.tmpl

# Use floating images.
# Makes the behaviour of images with the :align: attribute more like rst2html's

floating_images = false

# Support the ..raw:: html directive
raw_html = false
```



## 4 Pipe usage

If no input nor output are provided, `stdin` and `stdout` will be used respectively.

You may want to use `rst2pdf` in a linux pipe as such:

```
cat readme.txt | rst2pdf | gzip -c > readme.pdf.gz
```

or:

```
curl http://docutils.sourceforge.net/docs/user/rst/quickstart.txt | rst2pdf > quickstart.pdf
```

If no input argument is provided, `stdin` will be used:

```
cat readme.txt | rst2pdf -o readme.pdf
```

If output is set to dash (`-`), output goes to `stdout`:


```
rst2pdf -o - readme.txt > output.pdf
```

## 5 Images

### 5.1 Inline

You can insert images in the middle of your text like this:

```
This |biohazard| means you have to run.  
.. |biohazard| image:: assets/biohazard.png
```

This  means you have to run.

### 5.2 Supported Image Types

For raster images, rst2pdf supports anything PIL (The Python Imaging Library) supports. The exact list of supported formats varies according to your PIL version and system.

For SVG support, you need to install [svglib](#).

Some features will not work when using these images. For example, gradients will not display, and text may cause problems depending on font availability.

If you can choose between raster and vectorial images, for non-photographic images, vector files are usually smaller and look better, specially when printed.

#### Note

##### Image URLs

Attempting to be more compatible with rst2html, rst2pdf will try to handle images specified as HTTP or FTP URLs by downloading them to a temporary file and including them in the PDF.

This is probably not a good idea unless you are **really** sure the image won't go away.

### 5.3 Image Size

PDFs are meant to reflect paper. A PDF has a specific size in centimeters or inches.

Images usually are measured in pixels, which are meaningless in a PDF. To convert between pixels and inches or centimeters, we use a DPI (dots-per-inch) value.

For example, 300 pixels, with a 300DPI, are exactly one inch. 300 pixels at 100DPI are 3 inches.

For that reason, to achieve a nice layout of the page, it's usually a good idea to specify the size of your images in those units, or as a percentage of the available width and you can ignore all this DPI nonsense ;-)

The rst2pdf default is 300DPI, but you can change it using the `--default-dpi` option or the `default_dpi` setting in the config file.

Examples of images with specified sizes:

```
.. image:: home.png  
   :width: 3in  
  
.. image:: home.png  
   :width: 80%
```

```
.. image:: home.png
   :width: 7cm
```

The valid units you can use are: em, ex, px, in, cm, mm, pt, pc, %, " ".

- **px**: Pixels. If you specify the size using this unit, rst2pdf will convert it to inches using the default DPI explained above.
- **No unit**. If you just use a number, it will be considered as pixels. (**IMPORTANT**: this used to default to points. It was changed to be more compatible with rst2html)
- **em**: This is the same as your base style's font size. By default: 10 points.
- **ex**: rst2pdf will use the same broken definition as IE: em/2. In truth this should be the height of the lower-case x character in your base style.
- **in**: Inches (1 inch = 2.54 cm).
- **cm**: centimeters (1cm = 0.39 inches)
- **mm**: millimeters (10mm = 1cm)
- **pt**: 1/72 inch
- **pc**: 1/6 inch
- **%**: percentage of available width in the frame. Setting a percentage as a height does **not** work and probably never will.

If you don't specify a size at all, rst2pdf will do its best to figure out what it should do:

Since there is no specified size, rst2pdf will try to convert the image's pixel size to inches using the DPI information available in the image itself. You can set that value using most image editors. For example, using Gimp, it's in the Image -> Print Size menu.

So, if your image is 6000 pixels wide, and is set to 1200DPI, it will be 5 inches wide.

If your image doesn't have a DPI property set, and doesn't have it's desired size specified, rst2pdf will arbitrarily decide it should use 300DPI (or whatever you choose with the `--default-dpi` option).

## 6 Styling ReStructuredText

For well-formatted and consistent PDFs, the best starting point is well-formatted and consistent markup. There are some excellent references for ReStructuredText which we won't reproduce here but they are highly recommended as a starting point for working with rst2pdf.

In general, applying a stylesheet to a structured document will output a decent PDF with minimum fuss. That said, there are plenty of customisation and styling options available so read on if that sounds interesting.

### 6.1 Applying Styles

rst2pdf applies a default set of styles to the document. This default set can be viewed using `rst2pdf --print-stylesheet` which prints out `rst2pdf/styles/styles.yaml`.

Each subsequent style within each style sheet file specified the `--style-sheets` CLI parameter is then registered in the the list of known styles known to rst2pdf. If the name of the style is already known, then the attributes specified in the style are applied "on top" of the already registered style.

rst2pdf will then resolve the `parent` style, which is why the order of inclusion matters per-style-name, not globally. That is, if you set the color of `bodytext` first in a file and then set the color of `normal` in a subsequent file, then the color you have set for `bodytext` will be the color used for paragraphs (unless overridden by a `class` directive. Further information on creating stylesheet files is available in [Creating Stylesheets](#).

You can style paragraphs with a style using the class directive:

```
.. class:: special

This paragraph is special.

This one is not.
```

Multiple styles can be listed and are applied in order where properties in the right hand styles override those to the left:

```
.. class:: special bluetext redtext

    This paragraph is special and is red.

This one is not.
```

Or inline styles using custom interpreted roles:

```
.. role:: redtext

I like color :redtext:`red`.
```

For more information about this, please check the rST docs, and for style information check the section in this manual on [inline styles](#).

### 6.2 Headers and Footers

rST supports headers and footers, using the header and footer directive:

```
.. header::
```

```
This will be at the top of every page.
```

Often, you may want to put a page number there, or a section name. The following magic tokens will be replaced (More may be added as rst2pdf evolves):

```
###Page###
```

Replaced by the current page number.

```
###Title###
```

Replaced by the document title

```
###Section###
```

Replaced by the current section title

```
###SectNum###
```

Replaced by the current section number. **Important:** You must use the sectnum directive for this to work.

```
###Total###
```

Replaced by the total number of pages in the document. Keep in mind that this is the **real** number of pages, not the displayed number, so if you play with [page counters](#) this number will probably be wrong.

Headers and footers are visible by default but they can be disabled by specific [Page Templates](#) for example, cover pages. You can also set headers and footers via *command line options* or the [configuration file](#).

If you want to do things like "put the page number on the *out* side of the page, check [The oddeven directive](#)

## 6.3 Footnotes

Currently rst2pdf doesn't support real footnotes, and converts them to endnotes. There is a real complicated technical reason for this: I can't figure out a clean way to do it right.

You can get the same behaviour as with rst2html by specifying `--inline-footnotes`, and then the footnotes will appear where you put them (in other words, not footnotes, but "in-the-middle-of-text-notes" or just plain notes.)

## 7 Customizing PDF Output

Stylesheets are used to control many aspects of the PDF output.

- General look and feel, colours, fonts, templates
- Page size
- Syntax highlighting for code

The stylesheets use a YAML format (JSON is also supported). Older versions of this tool used an RSON format; this is also still supported but we recommend you check the section on *migrating to yaml stylesheets* and update them (it's painless!)

### 7.1 Using Stylesheets

Specify a stylesheet to use with `-s`:

```
rst2pdf mydoc.rst -s mystyles
```

Often it makes sense to specify multiple stylesheets, for example to set the page size, the main styles, and some syntax highlighting. In that case, use comma-separated values:

```
rst2pdf mydoc.rst -s a4,mystyles,murphy
```

Order does matter: `rst2pdf` applies its own stylesheet first and then the list in given in order, so the last stylesheet in the list will take precedence over the ones that went before.

Styles will always be searched in these places, in order:

- What you specify using `--stylesheet_path`
- The option `stylesheet_path` in the config file
- The current folder
- `~/rst2pdf/styles`
- The styles folder within `rst2pdf`'s installation folder.

### 7.2 Included StyleSheets

To make some of the more common adjustments easier, `rst2pdf` includes a collection of stylesheets you can use:

#### Font styles

These stylesheets modify your font settings.

- `serif` uses the PDF serif font (Times) instead of the default Sans Serif (Arial)
- `freetype-sans` uses your system's default TrueType Sans Serif font
- `freetype-serif` uses your system's default TrueType Serif font
- `twelvepoint` makes the base font 12pt (default is 10pt)
- `tenpoint` makes the base font 10pt
- `eightpoint` makes the base font 8pt

#### Page layout styles

These stylesheets modify your page layout.

- `twocolumn` uses the `twoColumn` layout as the initial page layout.

- `double-sided` adds a gutter margin (margin at the "in side" of the pages)

### Page size styles

Stylesheets that change the paper size.

The usual standard paper sizes are supported: A0, A1, A2, A3, A4 (default), A5, A6, B0, B1, B2, B3, B4, B5, B6, Letter, Legal, 11x17

The name of the stylesheet is lowercase.

### Code block styles

See [Syntax Highlighting](#)

So, if you want to have a two-column, legal size, serif document with code in `murphy` style:

```
rst2pdf mydoc.txt -s twocolumn,serif,murphy,legal
```

## 7.3 Default Stylesheet

You can make `rst2pdf` print the default stylesheet:

```
rst2pdf --print-stylesheet
```

This makes an excellent starting point for creating a stylesheet. The default one is always included by default, so only the values that should be changed need to be included in the new stylesheet.

## 7.4 Migrating Stylesheet Format

Historically, (version 0.98 and earlier) `rst2pdf` had support for JSON and RSON stylesheets. Those stylesheets should still work if you are still using them but a warning will be produced:

```
[WARNING] styles.py:617 Stylesheet "./example.style" in outdated format, recommend converting to YAML
```

To update your stylesheet, use the `rst2pdf.style2yaml` utility:

```
python3 -m rst2pdf.style2yaml example.style
```

The command also accepts a list of paths, or wildcards, and by default will output the new stylesheet(s) to stdout. To write them to files instead, use the `--save` flag with the command above.

## 7.5 Migrating to the New Default Stylesheet

Historically (version 0.98 and earlier), `rst2pdf` used a different default style sheet. The updated default style file provide a more modern look to `rst2pdf` documents. To do this, it updates various spacing, margins and fonts. It also updates page template and font alias names and so you will need to make adjustments to derived style files.

Until you make these adjustments, you can use the historical default style sheet using by adding the `rst2pdf-0-9` style using the `-s` command line switch. For example:

```
rst2pdf mydoc.rst -s rst2pdf-0-9,mystyle.yaml
```

### 7.5.1 Updated Font Alias Names

The font aliases used for the standard fonts have changed from those used in the historical default style sheet. As such, you will need to update to the new names in any derivative style files.

This table shows the old name and the equivalent new name:

Historical	Current
stdFont	fontSerif
stdSerif	fontSerif
stdBold	fontSerifBold
stdBoldItalic	fontSerifBoldItalic
stdItalic	fontSerifItalic
stdMono	fontMono
stdMonoBold	fontMonoBold
stdMonoBoldItalic	fontMonoBoldItalic
stdMonoItalic	fontMonoItalic
stdSans	fontSans
stdSansBold	fontSansBold
stdSansBoldItalic	fontSansBoldItalic
stdSansItalic	fontSansItalic

### 7.5.2 Updated Page Template Names

The page template names used in the new default style sheet are different from the historical default style sheet. As such, you will need to update to the new names in any derivative style files.

This table shows the old name and the equivalent new name:

Historical	Current
–	mainPage
cutePage	decoratedPage
emptyPage	emptyPage
oneColumn	oneColumn
twoColumn	Move to separate twocolumn template file
threeColumn	–

Note that firstTemplate is now mainPage. Historically, it was oneColumn.



## 8 Creating Stylesheets

The stylesheets are YAML-formatted and give control over many aspects of how the PDF is rendered. The main aspects are the styles of the elements, the page setup and templates, and the fonts to use. These are described in the following sections.

Only the settings that you want to change need to be included so for example, this would be a valid stylesheet:

```
pageSetup:
  size: A5
fontsAlias:
  stdFont: Times-Roman
styles:
  normal:
    fontSize: 14
```

### 8.1 Styles in Detail

At the top level there is a bit of an outlier: `linkColor`. You can specify any color name or a hex value:

```
linkColor: #330099
```

Most of the other elements for colours and formatting are in the *styles* section.

There are particular styles which have great effect, they are `base`, `normal` and `bodytext`.

Here's an example, the `twelvepoint` stylesheet:

```
styles:
  base:
    fontSize: 12
```

Since all other styles inherit `base`, changing the `fontSize` changes the `fontSize` for everything in your document.

The `normal` style is meant for most elements, so usually it's the same as changing `base`.

The `bodytext` style is for elements that form paragraphs. So, for example, you can set your document to be left-aligned like this:

```
styles:
- bodytext:
  alignment: TA_LEFT
```

There are elements, however, that don't inherit from `bodytext`, for example headings and the styles used in the table of contents. Those are elements that are not real paragraphs, so they should not follow the indentation and spacing you use for your document's main content.

The `heading` style is inherited by all sorts of titles: section titles, topic titles, admonition titles, etc.

If your document requires a style that is not defined in your stylesheet, it will print a warning and use `bodytext` instead.

Also, the order of the styles is important: if `styleA` is the parent of `styleB`, `styleA` should be earlier in the stylesheet.

## 8.2 Style Elements

Within the `styles` element, it is possible to configure each element type. The following section lays out the known options and examples of how to use them. (This list is known to be incomplete, we're working on it and accept any additions you have).

### parent

Each style property can inherit from another, for example the `code` style inherits from the `literal` style which sets the font used for fixed-width text throughout the document.

Example:

```
code:
  parent: literal
```

### fontName

The name of the font to use for this type of element. It can be either the name of a font on your system, or one of the aliased fonts. The default is Helvetica as shown in the example here.

Example:

```
fontName: Helvetica
```

See also:

- [Font Alias](#)
- [Fonts](#)

### fontSize

Use either a number (meaning point size) or a percentage. The default size for bodytext is 10.

Example:

```
fontSize: 150%
```

### leftIndent and rightIndent

Example:

```
leftIndent: 0
rightIndent: 0
```

### firstLineIndent

Example:

```
firstLineIndent: 0
```

### alignment

The paragraph justification of the text. The values `TA_LEFT` and `TA_RIGHT` can be used.

Example:

```
alignment: TA_LEFT
```

**spaceBefore** and **spaceAfter**

The amount of vertical space included before or after an element. Especially useful when working with `bullet-list` and `bullet-list-item` elements.

Example:

```
spaceBefore: 4
spaceAfter: 8
```

**bullet** -related styles

The bullets can be complex to style, but there are some tricks that might help. The vertical space before and after the list and item elements are controlled by the `spaceBefore` and `spaceAfter` properties. Also these lists are *tables* so those styles also apply.

Example:

```
bulletFontName: Helvetica
bulletFontSize: 10
bulletText: "\u2022"
bulletIndent: 0
```

See also:

- [Table Styles](#)

**textColor**

Use either a color name, or a hex value including the # character at the start.

Example:

```
textColor: black
```

**backColor**

Use either the value `None`, a color name, or a hex value including the # character at the start. Sets the background color of the element.

Example:

```
backColor: beige
```

**wordWrap**

Can be set to `None`.

Example:

```
wordWrap: None
```

**border** -related styles

Setting and styling the border for an element. The example is from the default code block style.

Example:

```
borderColor: darkgray
borderPadding: 6
```

```
borderWidth: 0.5
borderRadius: None
```

### **allowWidows and allowOrphans**

These directives are passed to ReportLab if they are present. Currently only implemented for paragraph styles.

Example:

```
allowWidows: 5
allowOrphans: 4
```

See also:

- [Widows and Orphans](#)

### **margin** -related styles

This sets the margins of the element. On the `pageSetup` itself, you can use `margin-gutter`. That's the margin in the center of a two-page spread. This value is added to the left margin of odd pages and the right margin of even pages, adding (or removing, if it's negative) space "in the middle" of opposing pages. If you intend to bound a printed copy, you may need extra space there. OTOH, if you will display it on-screen on a two-page format (common in many PDF readers, nice for ebooks), a negative value may be pleasant.

Example:

```
margin-top: 2cm
margin-bottom: 2cm
margin-left: 2cm
margin-right: 2cm
margin-gutter: 0cm
```

## 8.2.1 Inline Styles

The following are the only attributes that work on styles when used for interpreted roles (inline styles):

- `fontName`
- `fontSize`
- `textColor`
- `backColor`

## 8.2.2 Lists

Styling lists is mostly a matter of spacing and indentation.

The space before and after a list is taken from the `item-list` and `bullet-list` styles:

```
styles:
  item-list
    parent: bodytext
    spaceBefore: 0
    commands:
      - - VALIGN: [[0, 0], [-1, -1]]
        - TOP
      - - RIGHTPADDING: [[0, 0], [1, -1], 0]
    colWidths:
```

```

- 20pt
- bullet-list
  parent: bodytext
  spaceBefore: 0
  commands:
  - - VALIGN: [[0, 0], [-1, -1]]
    - TOP
  - - RIGHTPADDING: [[0, 0], [1, -1], 0]
  colWidths:
  - '20'

```

Yes, these are table styles, because they are implemented as tables. The `RIGHTPADDING` command and the `colWidths` option can be used to adjust the position of the bullet/item number.

To control the separation between items, you use the `item-list-item` and `bullet-list-item` styles' `spaceBefore` and `spaceAfter` options. For example:

```

bullet-list-item:
  parent: bodytext
  spaceBefore: 20

```

Remember that this is only used **between items** and not before the first or after the last items.

## 8.3 Page Layout

There are some layouts available as standard stylesheets, but it is likely that you will also want to describe your own templates.

### 8.3.1 Page Setup

In your stylesheet, the `pageSetup` element controls your page layout.

Here's the default stylesheet's element:

```

pageSetup:
  size: A4
  width:
  height:
  margin-top: 2cm
  margin-bottom: 2cm
  margin-left: 2cm
  margin-right: 2cm
  spacing-header: 5mm
  spacing-footer: 5mm
  margin-gutter: 0cm

```

Size is one of the standard paper sizes, like A4 or LETTER.

Here's a list: A0, A1, A2, A3, A4, A5, A6, B0, B1, B2, B3, B4, B5, B6, LETTER, LEGAL, ELEVENSEVENTEEN.

If you want a non-standard size, set `size` to `null` and use `width` and `height`. When specifying width, height or margins, you need to use units, like inch (inches) or cm (centimeters). For example, a slide deck in a 16:9 ratio can be created as a document with width 32cm and height 18cm:

```

pageSetup:
  size: null

```

```
width: 32cm
height: 18cm
```

When both width/height and size are specified, size will be used, and width/height ignored.

### 8.3.2 Page Templates

By default, your document will have a single column of text covering the space between the margins. You can change that, though, in fact you can do so even in the middle of your document!

To do it, you need to define *Page Templates* in your stylesheet. The default stylesheet already has three of them:

```
pageTemplates:
  coverPage:
    frames:
      - [0cm, 0cm, 100%, 100%]
    showHeader: false
    showFooter: false
  oneColumn:
    frames:
      - [0cm, 0cm, 100%, 100%]
  twoColumn:
    frames:
      - [0cm, 0cm, 49%, 100%]
      - [51%, 0cm, 49%, 100%]
```

A page template has a name (`oneColumn`, `twoColumn`), some options, and a list of frames. A frame is a list containing this:

```
[ left position, bottom position, width, height, left padding, bottom padding, right padding, top padding]
```

All the padding values are optional and default to 6 points.

For example, this defines a frame "at the very left", "at the very bottom", "a bit less than half a page wide" and "as tall as possible":

```
[ "0cm", "0cm", "49%", "100%" ]
```

And this means "the top third of the page":

```
[ "0cm", "66.66%", "100%", "33.34%" ]
```

You can use all the usual units, `cm`, `mm`, `inch`, and `%`, which means "percentage of the page (excluding margins and headers or footers)". Using `%` is probably the smartest for columns and gives you a fluid layout, while the other units are better for more "fixed" elements.

Since we can have more than one template, there is a way to specify which one we want to use, and a way to change from one to another.

To specify the first template, do it in your stylesheet, in `pageSetup` (`oneColumn` is the default):

```
pageSetup:
  firstTemplate: oneColumn
```

Then, to change to another template, in your document use this syntax (will change soon, though):

```
.. raw:: pdf

    PageBreak twoColumn
```

That will trigger a page break, and the new page will use the twoColumn template.

You can see an example of this in the *Montecristo* folder in the source package.

The supported page template options and their defaults are:

- `showHeader : True`
- `defaultHeader : None`  
Has the same effect as the header directive in the document.
- `showFooter : True`
- `defaultFooter : None`  
Has the same effect as the footer directive in the document.
- `background: None`  
The background should be an image, which will be centered in your page or stretched to match your page size, depending on the `--fit-background-mode` option, so use with caution.

## 8.4 Font Alias

This is the `fontsAlias` element. By default, it uses some of the standard PDF fonts:

```
fontsAlias:
  stdFont: Helvetica
  stdBold: Helvetica-Bold
  stdItalic: Helvetica-Oblique
  stdBoldItalic: Helvetica-BoldOblique
  fontMono: Courier
```

This defines the fonts used in the styles. You can use, for example, Helvetica directly in a style, but if later you want to use another font all through your document, you will have to change it in each style. So, I suggest you use aliases.

More information in the dedicated [Fonts](#) section.

## 8.5 Widows and Orphans

### Widow

A paragraph-ending line that falls at the beginning of the following page/column, thus separated from the remainder of the text.

### Orphan

A paragraph-opening line that appears by itself at the bottom of a page/column.

`rst2pdf` has *some* widow/orphan control. Specifically, here's what's currently implemented:

On ordinary paragraphs, `allowWidows` and `allowOrphans` is passed to `reportlab`, which is supposed to do something about it if they are non-zero. In practice, it doesn't seem to have much effect.

The plan is to change the semantics of those settings, so that they mean the minimum number of lines that can be left alone at the beginning of a page (widows) or at the end (orphans).

Currently, these semantics only work for literal blocks and code blocks.

```
A literal block::

    This is a literal block.
```

A code block:

```
.. code-block:: python

    def x(y):
        print y**2
```

In future versions this may extend to ordinary paragraphs.

## 8.6 Table Styles

These are a few extra options in styles that are only used when the style is applied to a table. This happens in two cases:

1. You are using the class directive on a table:

```
.. class:: thick

+-----+-----+
|      A      |      B      |
+-----+-----+
```

2. It's a style that automatically applies to something that is *drawn* using a table. Currently these include:

- Footnotes / endnotes (endnote style)
- Lists (item-list, bullet-list, option-list and field-list styles)

The options are as follows:

### Commands

For a full reference of these, please check the Reportlab User Guide specifically the TableStyle Commands section (section 7.4 in the manual for version 2.3)

Here, however, is a list of the possible commands:

```
BOX (or OUTLINE)
FONT
FONTNAME (or FACE)
FONTSIZE (or SIZE)
GRID
INNERGRID
LEADING
LINEBELOW
LINEABOVE
LINEBEFORE
LINEAFTER
TEXTCOLOR
ALIGNMENT (or ALIGN)
LEFTPADDING
RIGHTPADDING
BOTTOMPADDING
TOPPADDING
```



```
BACKGROUND
ROWBACKGROUNDS
COLBACKGROUNDS
VALIGN
```

Each takes as argument a couple of coordinates, where (0,0) is top-left, and (-1,-1) is bottom-right, and 0 or more extra arguments.

For example, INNERGRID takes a line width and a color:

```
[ "INNERGRID", [ 0, 0 ], [ -1, -1 ], 0.25, "black" ],
```

That would mean "draw all lines inside the table with .25pt black"

colWidths

A list of the column widths you want, in the unit you prefer (default unit is pt).

Example:

```
"colWidths": [ "3cm", null ]
```

If your colWidths has fewer values than columns in your table, the rest are auto-calculated. A column width of null means "guess".

If you don't specify column widths, the table will try to look proportional to the restructured text source.

## Note

The command option used for table styles is not kept across stylesheets. For example, the default stylesheet defines endnote with this command list:

```
"commands": [ [ "VALIGN", [ 0, 0 ], [ -1, -1 ], "TOP" ] ]
```

If you redefine endnote in another stylesheet and use this to create a vertical line between the endnote's columns:

```
"commands": [ [ "LINEAFTER", [ 0, 0 ], [ 1, -1 ], .25, "black" ] ]
```

Then the footnotes will **not** have VALIGN TOP!

To do that, you **MUST** use all commands in your stylesheet:

```
"commands": [
  [ "VALIGN", [ 0, 0 ], [ -1, -1 ], "TOP" ],
  [ "LINEAFTER", [ 0, 0 ], [ 1, -1 ], .25, "black" ]
]
```

## 9 Syntax Highlighting

rst2pdf adds a non-standard directive, called `code-block`, which produces syntax highlighted for many languages using [Pygments](#).

For example, if you want to include a Python fragment:

```
.. code-block:: python

    def myFun(x,y):
        print x+y
```

```
def myFun(x,y):
    print x+y
```

Notice that you need to declare the language of the fragment. Here's a list of the currently [supported](#).

You can use the `linenos` option to display line numbers:

```
1 def myFun(x,y):
2     print x+y
```

You can use the `hl_lines` option to emphasize certain lines by dimming the other lines. This parameter takes a space separated list of line numbers. The other lines are then styled with the class `pygments_dim1` that defaults to gray. For example, to highlight `print "line a"` and `print "line b"`:

```
def myFun(x,y):
    print "line a"
    print "line b"
    print "line c"
```

rst2pdf includes several stylesheets for highlighting code:

- abap
- algol\_nu
- algol
- arduino
- autumn
- borland
- bw
- colorful
- default
- emacs
- friendly
- fruity
- igor
- lovelace
- manni

- monokai
- murphy
- native
- paraiso-dark
- paraiso-light
- pastie
- perldoc
- rainbow\_dash
- rrt
- sas
- solarized-dark
- solarized-light
- sphinx
- stata-dark
- stata-light
- stata
- styles
- tango
- trac
- vim
- vs
- xcode

You can use any of them instead of the default by adding, for example, a `-s murphy` to the command line.

If you already are using a custom stylesheet, use both:

```
rst2pdf mydoc.rst -o mydoc.pdf -s mystyle.json,murphy
```

The default is the same as `emacs`.

There is an online demo of pygments showing these styles:

<http://pygments.org/demo/1817/>

The overall look of a code box is controlled by the "code" style or by a class you apply to it using the `.. class::` directive. Additionally, if you want to change some properties when using different languages, you can define styles with the name of the language. For example, a `python` style will be applied to code blocks created with `.. code-block:: python`.

The look of the line numbers is controlled by the `linenumbers` style.

As `rst2pdf` is written in Python, let's see some examples and variations around Python.

Python in console

```
>>> my_string="python is great"
>>> my_string.find('great')
10
```

```
>>> my_string.startswith('py')
True
```

#### Python traceback

```
Traceback (most recent call last):
  File "error.py", line 9, in ?
    main()
  File "error.py", line 6, in main
    print call_error()
  File "error.py", line 2, in call_error
    r = 1/0
ZeroDivisionError: integer division or modulo by zero
Exit 1
```

The code-block directive supports many options, that mirror Pygments':

FIXME: fix this to really explain them all. This is a placeholder.

```
'stripnl' : string_bool,
'stripall': string_bool,
'ensurenl': string_bool,
'tabsize' : directives.positive_int,
'encoding': directives.encoding,
# Lua
'func_name_highlighting': string_bool,
'disabled_modules': string_list,
# Python Console
'python3': string_bool,
# Delphi
'turbopascal': string_bool,
'delphi' : string_bool,
'freepascal': string_bool,
'units': string_list,
# Modula2
'pim' : string_bool,
'iso' : string_bool,
'objm2' : string_bool,
'gm2ext': string_bool,
# CSharp
'unicodelevel' : csharp_unicodelevel,
# Literate haskell
'litstyle' : lhs_litstyle,
# Raw
'compress': raw_compress,
# Rst
'handlecodeblocks': string_bool,
# Php
'startinline': string_bool,
'funcnamehighlighting': string_bool,
'disabledmodules': string_list,
```

You can find more information about them in the pygments manual.

## 9.1 File inclusion

You can use the `code-block` directive with an external file, using the `:include:` option:

```
.. code-block:: python
   :include: setup.py
```

This will give a warning if `setup.py` doesn't exist or can't be opened.

### 9.1.1 Include with Boundaries

You can add selectors to limit the inclusion to a portion of the file. The options are:

```
:start-at: string
    will include file beginning at the first occurrence of string, string included
:start-after: string
    will include file beginning at the first occurrence of string, string excluded
:end-before: string
    will include file up to the first occurrence of string, string excluded
:end-at: string
    will include file up to the first occurrence of string, string included
```

Let's display a class from `rst2pdf`:

```
.. code-block:: python
   :include: assets/flowables.py
   :start-at: class Separation(Flowable):
   :end-before: class Reference(Flowable):
```

This command gives

```
class Separation(Flowable):
    """A simple <hr>-like flowable"""

    def wrap(self, w, h):
        self.w = w
        return w, 1 * cm

    def draw(self):
        self.canv.line(0, 0.5 * cm, self.w, 0.5 * cm)
```

### 9.1.2 Options

`linenos`

Display line numbers along the code

`linenos_offset`

If you include a file and are skipping the beginning, using the `linenos_offset` makes the line count start from the real line number, instead of 1.

## 10 Fonts

Working with fonts on many different platforms is a challenge. Here you will find the best information we have, but questions and updates are always welcome.

### 10.1 Standard PDF Fonts

The standard PDF fonts are always available, here is the list:

- Times\_Roman
- Times-Bold
- Times-Italic
- Times-Bold-Italic
- Helvetica
- Helvetica\_Bold
- Helvetica-Oblique
- Helvetica-Bold-Oblique
- Courier
- Courier-Bold
- Courier-Oblique
- Courier-Bold-Oblique
- Symbol
- Zapf-Dingbats

### 10.2 Font Embedding

There are thousands of excellent free True Type and Type 1 fonts available on the web, and you can use many of them in your documents by declaring them in your stylesheet.

#### 10.2.1 The Easy Way

Just use the font name in your style. For example, you can define this:

```
normal:
  fontName: fonty
```

And then it *may* work.

What would need to happen for this to work?

##### 10.2.1.1 Fonty is a True Type font:

1. You need to have it installed in your system, and have the fc-match utility available (it's part of [fontconfig](#)). You can test if it is so by running this command:

```
$ fc-match fonty
fonty.ttf: "Fonty" "Normal"
```

If you are in Windows, I need your help ;- ) or you can use [The Harder Way \(True Type\)](#)

2. The folder where `fonty.ttf` is located needs to be in your font path. You can set it using the `--font-path` option. For example:

```
rst2pdf mydoc.txt -s mystyle.style --font-path /usr/share/fonts
```

You don't need to put the *exact* folder, just something that is above it. In my own case, `fonty` is in `/usr/share/fonts/TTF`

Whenever a font is embedded, you can refer to it in a style by its name, and to its variants by the aliases `Name-Oblique`, `Name-Bold`, `Name-BoldOblique`.

#### 10.2.1.2 Fonty is a Type 1 font:

You need it installed, and the folders where its font metric (`.afm`) and binary (`.pfb`) files are located need to be in your font path.

For example, the "URW Palladio L" font that came with my installation of TeX consists of the following files:

```
/usr/share/texmf-dist/fonts/type1/urw/palatino/uplb8a.pfb
/usr/share/texmf-dist/fonts/type1/urw/palatino/uplbi8a.pfb
/usr/share/texmf-dist/fonts/type1/urw/palatino/uplr8a.pfb
/usr/share/texmf-dist/fonts/type1/urw/palatino/uplri8a.pfb
/usr/share/texmf-dist/fonts/afm/urw/palatino/uplb8a.afm
/usr/share/texmf-dist/fonts/afm/urw/palatino/uplbi8a.afm
/usr/share/texmf-dist/fonts/afm/urw/palatino/uplr8a.afm
/usr/share/texmf-dist/fonts/afm/urw/palatino/uplri8a.afm
```

So, I can use it if I put `/usr/share/texmf-dist/fonts` in my font path:

```
rst2pdf mydoc.txt -s mystyle.style --font-path /usr/share/texmf-dist/fonts
```

And putting this in my stylesheet, for example:

```
title:
  fontName: URWPalladioL-Bold
```

There are some standard aliases defined so you can use other names:

```
'ITC Bookman'           : 'URW Bookman L',
'ITC Avant Garde Gothic' : 'URW Gothic L',
'Palatino'              : 'URW Palladio L',
'New Century Schoolbook' : 'Century Schoolbook L',
'ITC Zapf Chancery'      : 'URW Chancery L'
```

So, for example, you can use `Palatino` or `New Century SchoolBook-Oblique` And it will mean `URWPalladioL` or `CenturySchL-Ital`, respectively.

Whenever a font is embedded, you can refer to it in a style by its name, and to its variants by the aliases `Name-Oblique`, `Name-Bold`, `Name-BoldOblique`.

### 10.2.2 The Harder Way (True Type)

The stylesheet has an element `isEmbeddedFonts` that handles embedding True Type fonts in your PDF. Usually, it's empty, because with the default styles you are not using any font beyond the standard PDF fonts:

```
embeddedFonts: [ ]
```

You can put there the name of the font, and rst2pdf will try to embed it as described above. Example:

```
embeddedFonts: [Tuffy]
```

Or you can be explicit and tell rst2pdf the files that contain each variant of the font.

Suppose you want to use the nice public domain [Tuffy font](#), then you need to give the filenames of all variants:

```
embeddedFonts: [Tuffy.ttf, Tuffy_Bold.ttf, Tuffy_Italic.ttf, Tuffy_Bold_Italic.ttf]
```

This will provide your styles with fonts called `Tuffy`, `Tuffy_Bold` and so on. They will be available with the names based on the filenames (`Tuffy_Bold`) and also by standard aliases similar to those of the standard PDF fonts (`Tuffy-Bold`, `Tuffy-Oblique`, `Tuffy-BoldOblique`, etc..)

Now, if you use *italics* in a paragraph whose style uses the Tuffy font, it will use `Tuffy_Italic`. That's why it's better if you use fonts that provide the four variants, and you should put them in **that** order. If your font lacks a variant, use the "normal" variant instead.

For example, if you only had `Tuffy.ttf`:

```
embeddedFonts: [Tuffy.ttf, Tuffy.ttf, Tuffy.ttf, Tuffy.ttf]
```

However, that means that italics and bold in styles using Tuffy will not work correctly (they will display as regular text).

If you want to use this as the base font for your document, you should change the `fontsAlias` section accordingly. For example:

```
fontsAlias:
  stdFont: Tuffy
  stdBold: Tuffy_Bold
  stdItalic: Tuffy_Italic
  stdBoldItalic: Tuffy_Bold_Italic
  fontMono: Courier
```

If, on the other hand, you only want a specific style to use the Tuffy font, don't change the `fontAlias` but rather set the `fontName` properties for that style. For example:

```
heading1:
  parent: normal
  fontName: Tuffy_Bold
  fontSize: 18
  keepWithNext: true
  spaceAfter: 6
```

By default, rst2pdf will search for the fonts in its fonts folder and in the current folder. You can make it search another folder by passing the `--font-folder` option, or you can use absolute paths in your stylesheet.



## 11 Raw Directive

### 11.1 Raw PDF

rst2pdf has a very limited mechanism to pass commands to reportlab, the PDF generation library. You can use the raw directive to insert pagebreaks and spacers (other reportlab flowables may be added if there's interest), and set page transitions.

The syntax is shell-like, here's an example:

```
One page

.. raw:: pdf

    PageBreak background=images/background.jpg fit-background-mode=scale

Another page. Now some space:

.. raw:: pdf

    Spacer 0,200
    Spacer 0 200

And another paragraph.
```

The unit used by the spacer by default is points, and using a space or a comma is the same thing in all cases.

### 11.2 Page Counters

In some documents, you may not want your page counter to start in the first page.

For example, if the first pages are a coverpage and a table of contents, you want page 1 to be where your first section starts.

To do that, you have to use the `SetPageCounter` command.

Here is a syntax example:

```
.. raw:: pdf

    SetPageCounter 0 lowerroman
```

This sets the counter to 0, and makes it display in lower roman characters (i, ii, iii, etc) which is a style often used for the pages before the document proper (for example, TOCs and abstracts).

It can take zero or two arguments.

`SetPageCounter`

When used with no arguments, it sets the counter to 0, and the style to arabic numerals.

`SetPageCounter number style`

When used with two arguments, the first argument must be a number, it sets the page counter to that number.

The second number is a style of counter. Valid values are:

- lowerroman: i, ii, iii, iv, v ...

- roman: I, II, III, IV, V ...
- arabic: 1, 2, 3, 4, 5 ...
- loweralpha: a, b, c, d, e ... [Don't use for numbers above 26]
- alpha: A, B, C, D, E ... [Don't use for numbers above 26]

#### Note

Page counter changes take effect on the **current** page.

## 11.3 Page Breaks

There are three kinds of page breaks:

`PageBreak`

Break to the next page

`EvenPageBreak`

Break to the next **even** numbered page

`OddPageBreak`

Break to the next **odd** numbered page

Each of them can take an optional argument which is the name of the next page template. For example:

```
PageBreak twoColumn
```

In addition, two additional attributes are supported: `background` and `fit-background-mode`. These allow setting the background image for this page and how to fit it (One of `scale`, `scale_width` or `center`). For example:

```
PageBreak mainPage background="images/background.jpg"
```

or:

```
PageBreak background=images/background.jpg fit-background-mode=scale
```

## 11.4 Frame Breaks

If you want to jump to the next frame in the page (or the next page if the current frame is the last), you can use the `FrameBreak` command. It takes an optional height in points, and then it only breaks the frame if there is less than that vertical space available.

For example, if you don't want a paragraph to begin if it's less than 50 points from the bottom of the frame:

```
.. raw:: pdf
```

```
FrameBreak 50
```

This paragraph is so important that I don't want it at the very bottom of the page...

## 11.5 Page Transitions

Page transitions are effects used when you change pages in *Presentation* or *Full Screen* mode (depends on the viewer). You can use it when creating a presentation using PDF files.

The syntax is this:

```
.. raw:: pdf

    Transition effect duration [optional arguments]
```

The optional arguments are:

direction

Can be 0,90,180 or 270 (top,right,bottom,left)

dimension

Can be H or V

motion

Can be I or O (Inside or Outside)

The effects with their arguments are:

- Split duration direction motion
- Blinds duration dimension
- Box duration motion
- Wipe duration direction
- Dissolve duration
- Glitter duration direction

For example:

```
.. raw:: pdf

    Transition Glitter 3 90
```

Uses the Glitter effect, for 3 seconds, at direction 90 degrees (from the right?)

Keep in mind that `Transition` sets the transition *from this page to the next* so the natural thing is to use it before a `PageBreak`:

```
.. raw:: pdf

    Transition Dissolve 1
    PageBreak
```

## 11.6 Text Annotations

Text annotations are meta notes added to a page.

The syntax is this:

```
.. raw:: pdf

    TextAnnotation "text to add" [optional position]
```

The optional position is a set of 4 numbers for `x_begin`, `y_begin``, ```x_end` and `y_end`

## 11.7 Raw HTML

If you have a document that contains raw HTML, and have `xhtml2pdf` installed, `rst2pdf` will try to render that HTML inside your document. To enable this, use the `--raw-html` command line option.

## 12 The counter role

### Note

The counter role only works in PDF, if you're reading the HTML version of the manual then this section is broken. Sorry :/

This is a nonstandard interpreted text role, which means it will only work with `rst2pdf`. It implements an unlimited number of counters you can use in your text. For example, you could use it to have numbered figures, or numbered tables.

The syntax is this:

```
Start a counter called seq1 that starts from 1: :counter:`seq1`
Now this should print 2: :counter:`seq1`

You can start counters from any number (this prints 12): :counter:`seq2:12`

And have any number of counters with any name: :counter:`figures`

So ``#seq1-2`` should link to `the number 2 above <#seq1-2>`_
```

The output is:

Start a counter called seq1 that starts from 1: 1 Now this should print 2: 2

You can start counters from any number (this prints 12): 12

And have any number of counters with any name: 1

Also, the counters create targets for links with this scheme: `#countername-number`.

So `#seq1-2` should link to [the number 2 above](#)

## 13 The version, revision roles

### Note

These are non-standard roles, which means they will only work with rst2pdf and not with rst2html or any other docutils tools.

The `version` and `revision` roles can be used to get the version and revision of an installed Python package. For example:

```
Welcome to rst2pdf :version:`rst2pdf` (:revision:`rst2pdf`)
```

### Important

The package in question must be installed in the same environment that you are running rst2pdf in.

## 14 The oddeven directive

This is a nonstandard directive, which means it will only work with rst2pdf, and not with rst2html or any other docutils tool.

The contents of oddeven should consist of **exactly** two things (in this case, two paragraphs). The first will be used on odd pages, and the second one on even pages.

If you want to use more complex content, you should wrap it with containers, like in this example:

```
.. oddeven::

    .. container::

        This will appear on odd pages.

        Both paragraphs in the container are for odd pages.

    This will appear on even pages. It's a single paragraph, so no need for
    containers.
```

This directive has several limitations.

- I intentionally have disabled splitting into pages for this, because I have no idea how that could make sense. That means that if its content is larger than a frame, you **will** make rst2pdf barf with one of those ugly errors.
- It will reserve the space of the larger of the two sets of contents. So if one is small and the other large, it **will** look wrong. I may be able to fix this though.
- If you try to generate HTML (or anything other than a PDF via rst2pdf) from a file containing this, it will not do what you want.

## 15 Mathematics

If you have [Matplotlib](#) installed, rst2pdf supports a math role and a math directive. You can use them to insert formulae and mathematical notation in your documents using a subset of LaTeX syntax, but doesn't require you have LaTeX installed.

For example, here's how you use the math directive:

```
.. math::

    \frac{2 \pm \sqrt{7}}{3}
```

And here's the result:

$$\frac{2 \pm \sqrt{7}}{3}$$

If you want to insert mathematical notation in your text like this:  $\pi$  that is the job of the math *role*:

```
This is :math:`\pi`
```

Produces: This is  $\pi$

Note that while the math directive embeds fonts and draws your formula as text, the math role embeds an image. That means:

- You can't copy the text of inline math
- Inline math will look worse when printed, or make your file larger.

So, use it only in emergencies ;-)

You don't need to worry about fonts, the correct math fonts will be used and embedded in your PDF automatically (they are included with `matplotlib`).

For an introduction to LaTeX syntax, see the "Typesetting Mathematical Formulae" chapter in "The Not So Short Introduction to LaTeX 2 $\epsilon$ " at <https://tobi.oetiker.ch/lshort/lshort.pdf>

Basically, the inline form `$a^2$` is similar to the math role, and the display form is similar to the math directive.



## 16 Hyphenation

If you want good looking documents, you want to enable hyphenation.

To do it, you first need to install the `pyphen` python module.

Then, you need to specify the language in each style that you want hyphenation to work. To have hyphenation in the whole document, you can do it in the `base` style.

For example, for an English document, hyphenation can be turned on for the whole document with:

```
base:
  hyphenationLang: en-US
  embeddedHyphenation: 1
```

Notice the `embeddedHyphenation` option. It is optional, but it makes so that hyphenations will give preference to splitting words at embedded hyphens in the text.

If you are creating a multilingual document, you can declare styles with specific languages. For example, you could inherit `bodytext` for Spanish:

```
bodytext_es:
  parent: bodytext
  hyphenationLang: es-ES
  embeddedHyphenation: 1
```

And all paragraphs declared using the `bodytext_es` style would have Spanish hyphenation:

```
.. class:: bodytext_es

Debo a la conjunción de un espejo y de una enciclopedia el descubrimiento de Uqbar.
El espejo inquietaba el fondo de un corredor en una quinta de la calle Gaona,
en Ramos Mejía; la enciclopedia falazmente se llama *The Anglo-American Cyclopaedia*
(New York, 1917) y es una reimpresión literal, pero también morosa, de la
*Encyclopaedia Britannica* de 1902.
```

If you want to disable hyphenation in a style that inherits `hyphenationLang` from its parent, you can do so by setting `hyphenationLang` to 0.

## 17 Smart Quotes

Quoted from the [smarty\\_pants](#) documentation:

This feature can perform the following transformations:

Straight quotes ( " and ' ) into "curly" quote HTML entities

Backticks-style quotes (`like this") into "curly" quote HTML entities

Dashes (-- and ---) into en- and em-dash entities

Three consecutive dots ( . . . or . . . ) into an ellipsis entity

This means you can write, edit, and save your posts using plain old ASCII straight quotes, plain dashes, and plain dots, but your published posts (and final PDF output) will appear with smart quotes, em-dashes, and proper ellipses.

You can enable this by passing the `--smart-quotes` option in the command line. By default, it's disabled. Here are the different values you can use (again, from the smarty\_pants docs):

**0**

Suppress all transformations. (Do nothing.)

**1**

Performs these transformations: quotes (including ``backticks" -style), em-dashes, and ellipses. "--" (dash dash) is used to signify an em-dash; there is no support for en-dashes.

**2**

Same as `smarty_pants="1"`, except that it uses the old-school typewriter shorthand for dashes: "--" (dash dash) for en-dashes, "---" (dash dash dash) for em-dashes.

**3**

Same as `smarty_pants="2"`, but inverts the shorthand for dashes: "--" (dash dash) for em-dashes, and "---" (dash dash dash) for en-dashes.

Currently, even if you enable it, this transformation will only take place in regular paragraphs, titles, headers, footers and block quotes.

## 18 Sphinx

[Sphinx](#) is a very popular tool. This is the description from its website:

Sphinx is a tool that makes it easy to create intelligent and beautiful documentation, written by Georg Brandl and licensed under the BSD license.

It was originally created to translate the new Python documentation, and it has excellent support for the documentation of Python projects, but other documents can be written with it too.

rst2pdf includes an experimental PDF extension for Sphinx.

To use it in your existing Sphinx project you need to do the following:

1. Add `rst2pdf.pdfbuilder` to extensions in your `conf.py`. For example:

```
extensions = ['sphinx.ext.autodoc', 'rst2pdf.pdfbuilder']
```

2. Add the PDF options at the end of `conf.py`, adapted to your project:

```
# -- Options for PDF output -----

# Grouping the document tree into PDF files. List of tuples
# (source start file, target name, title, author, options).
#
# If there is more than one author, separate them with \\.
# For example: r'Guido van Rossum\Fred L. Drake, Jr., editor'
#
# The options element is a dictionary that lets you override
# this config per-document. For example:
#
# ('index', 'MyProject', 'My Project', 'Author Name', {'pdf_compressed': True})
#
# would mean that specific document would be compressed
# regardless of the global 'pdf_compressed' setting.

pdf_documents = [
    ('index', 'MyProject', 'My Project', 'Author Name'),
]

# A comma-separated list of custom stylesheets. Example:
pdf_stylesheets = ['sphinx', 'a4']

# A list of folders to search for stylesheets. Example:
pdf_style_path = ['. ', '_styles']

# Create a compressed PDF
# Use True/False or 1/0
# Example: compressed=True
# pdf_compressed = False

# A colon-separated list of folders to search for fonts. Example:
# pdf_font_path = ['/usr/share/fonts', '/usr/share/texmf-dist/fonts/']

# Language to be used for hyphenation support
# pdf_language = "en_US"

# Mode for literal blocks wider than the frame. Can be
```

```
# overflow, shrink or truncate
# pdf_fit_mode = "shrink"

# Section level that forces a break page.
# For example: 1 means top-level sections start in a new page
# 0 means disabled
# pdf_break_level = 0

# When a section starts in a new page, force it to be 'even', 'odd',
# or just use 'any'
# pdf_breakside = 'any'

# Insert footnotes where they are defined instead of
# at the end.
# pdf_inline_footnotes = True

# verbosity level. 0 1 or 2
# pdf_verbosity = 0

# If false, no index is generated.
# pdf_use_index = True

# If false, no modindex is generated.
# pdf_use_modindex = True

# If false, no coverpage is generated.
# pdf_use_coverpage = True

# Name of the cover page template to use
# pdf_cover_template = 'sphinxcover.tmpl'

# Documents to append as an appendix to all manuals.
# pdf_appendices = []

# Enable experimental feature to split table cells. Use it
# if you get "DelayedTable too big" errors
# pdf_splittables = False

# Set the default DPI for images
# pdf_default_dpi = 72

# Enable rst2pdf extension modules
# pdf_extensions = []

# Page template name for "regular" pages
# pdf_page_template = 'cutePage'

# Show Table Of Contents at the beginning?
# pdf_use_toc = True

# How many levels deep should the table of contents be?
pdf_toc_depth = 9999

# Add section number to section references
pdf_use_numbered_links = False
```

```
# Background images fitting mode
pdf_fit_background_mode = 'scale'

# Repeat table header on tables that cross a page boundary?
pdf_repeat_table_rows = True

# Enable smart quotes (1, 2 or 3) or disable by setting to 0
pdf_smartquotes = 0
```

### 3. (Optional) Modify your Makefile or make.bat file

For Makefile (on \*nix systems)

```
pdf:
    $(SPHINXBUILD) -b pdf $(ALLSPHINXOPTS) _build/pdf
    @echo
    @echo "Build finished. The PDF files are in _build/pdf."
```

For make.bat (on Windows):

```
if "%1" == "pdf" (
    %SPHINXBUILD% -b pdf %ALLSPHINXOPTS% %BUILDDIR%/pdf
    echo.
    echo.Build finished. The PDF files are in %BUILDDIR%/pdf
    goto end
)
```

Then you can run `make pdf` or `sphinx-build -b pdf ...` similar to how you did it before.

## 19 Extensions

rst2pdf can get new features from *extensions*. Extensions are python modules that can be enabled with the `-e` option.

Several are included with rst2pdf.

### 19.1 Preprocess (`-e preprocess`)

`preprocess` is a rst2pdf extension module (invoked by `-e preprocess` on the rst2pdf command line).

There is a testcase for this file at `tests/test_preprocess.txt`

This preprocesses the source text file before handing it to docutils.

This module serves two purposes:

1. It demonstrates the technique and can be a starting point for similar user-written processing modules; and
2. It provides a simplified syntax for documents which are targeted only at rst2pdf, rather than docutils in general.

The design goal of "base rst2pdf" is to be completely compatible with docutils, such that a file which works as a PDF can also work as HTML, etc.

Unfortunately, base docutils is a slow-moving target, and does not make this easy. For example, SVG images do not work properly with the HTML backend unless you install a patch, and docutils has no concept of page breaks or additional vertical space (other than the `<hr>`).

So, while it would be nice to have documents that render perfectly with any backend, this goal is hard to achieve for some documents, and once you are restricted to a particular transformation type, then you might as well have a slightly nicer syntax for your source document.

Preprocessor extensions:

All current extensions except `style` occupy a single line in the source file.

`.. include::`

Processes the include file as well. An include file may either be a restructured text file, OR may be an RSON or JSON stylesheet. The determination is made by trying to parse it as RSON. If it passes, it is a stylesheet; if not, well, we'll let the docutils parser have its way with it.

`.. page::`

Is translated into a raw PageBreak.

`.. space::`

Is translated into a raw Spacer. If only one number given, is used for vertical space. This is the canonical use case, since horizontal space is ignored anyway!

`.. style::`

Allows you to create in-line stylesheets. As with other restructured text components, the stylesheet data must be indented. Stylesheets are in RSON or JSON.

`.. widths::`

creates a new table style (based on `table` or the first non-numeric token) and creates a class using that style specifically for the next table in the document. (Creates a `.. class::`, so you must specify `.. widths::` immediately before the table it applies to. Allows you to set the widths for the table, using percentages.

`SingleWordAtLeftColumn`

If a single word at the left column is surrounded by blank lines, the `singleword` style is automatically applied to the word. This is a workaround for the broken interaction between `docutils` subtitles and bibliographic metadata. (I found that `docutils` was referencing my subtitles from inside the TOC, and that seemed silly. Perhaps there is a better workaround at a lower level in `rst2pdf`.)

---

Preprocessor operation:

The preprocessor generates a file that has the same name as the source file, with `.build_temp.` embedded in the name, and then passes that file to the restructured text parser.

This file is left on the disk after operation, because any error messages from `docutils` will refer to line numbers in it, rather than in the original source, so debugging could be difficult if the file were automatically removed.

## 19.2 Dotted\_TOC (-e dotted\_toc)

All I did was take the `wrap()` method from the stock `reportlab` TOC generator, and make the minimal changes to make it work on MY documents in `rst2pdf`.

### History:

The `reportlab` TOC generator adds nice dots between the text and the page number. The `rst2pdf` one does not.

A closer examination reveals that the `rst2pdf` one probably deliberately stripped this code, because the `reportlab` implementation only allowed a single TOC, and this is unacceptable for at least some `rst2pdf` users.

There are other differences in the `rst2pdf` one I don't understand. This module is a hack to add back dots between the lines. Maybe at some point we can figure out if this is right, or how to support dots in the TOC in the main code.

Mind you, the original `RL` implementation is a complete hack in any case:

- It uses a callback to a nested function which doesn't even bother to assume the original enclosing scope is available at callback time. This leads it to do crazy things like `eval()`
- It uses a single name in the canvas for the callback function (this is what kills multiple TOC capability) when it would be extremely easy to generate a unique name.

## 20 Developers

### 20.1 Guidelines

If you want to do something inside `rst2pdf`, you are welcome! The process looks something like this:

- Create an Issue for the task at <https://github.com/rst2pdf/rst2pdf/issues>
- If you intend to fix a bug:
  - Create a **minimal** test case that shows the bug.
  - Put it inside `tests/input` like the others:
  - Fix the bug

During this process, you can run the individual test case to quickly iterate. For example:

```
pytest tests/input/test_issue_NNN.txt
```

You may also wish to check the logs and output:

```
less tests/output/test_issue_NNN.log  
xdg-open tests/output/test_issue_NNN.pdf # or 'open' on MacOS
```

- Once resolved, copy the generated output PDF, if any, to `tests/reference` and commit this along with the files in `tests/input`.
- Submit a pull request.
- If you added a command line option, document it in `doc/rst2pdf.txt`. That will make it appear in the manual and in the man page.
- If you implemented a new feature, please document it in `manual.rst` (or in a separate file and add an include in `manual.rst`)
- If you implement an extension, make the docstring valid restructured text and link it to the manual like the others.

### 20.2 Git config

After the mass-reformatting in PR 877, it is helpful to ignore the relevant commits that simply reformatted the code when using `git blame`.

The `..git-blame-ignore-revs` file contains the list of commits to ignore and you can use this git config line to make `git blame` work more usefully:

```
git config blame.ignoreRevsFile .git-blame-ignore-revs
```

### 20.3 Pre-commit

`rst2pdf` uses the [pre-commit](#) framework to automate various style checkers. This must be enabled locally. You can install this using `pip` or your local package manager. For example, to install using `pip`:

```
pip install pre-commit
```

Once installed, enable it like so:



```
pre-commit install --allow-missing-config
```

If `pre-commit` locally behaves differently to CI, then run `pre-commit clean` to clear your cache before further investigation.

## 20.4 Continuous Integration

There's a Travis build that runs when we open a pull request or merge to master, it does some style checks and runs the test suite.

## 20.5 Running tests

The *rst2pdf* test suite generates PDFs - stored in `tests/output` - which are then compared against reference PDFs - stored in `tests/reference` - using the [PyMuPDF](#) Python bindings for the [MuPDF](#) library. *rst2pdf* depends on a number of different tools and libraries, such as [ReportLab](#), and the output of these can vary slightly between releases. The *PyMuPDF* library allows us to compare the structure of the PDFs, with a minor amount of fuzzing to allow for minor differences caused by these changes in underlying dependencies.

### 20.5.1 First run

To run the tests for the first time, you will need to do some setup (after this, you can just work on your given virtualenv each time):

```
python -m venv env
. env/bin/activate

pip install pytest pytest-xdist
pip install -c requirements.txt [tests,sphinx,hyphenation,svgsupport,aafiguresupport,mathsupport,rawhtmlsupport]
pytest
```

### 20.5.2 Next runs

To run all tests, run:

```
pytest
```

You can also run tests in parallel by passing the `-n auto` flag:

```
pytest -n auto
```

### 20.5.3 Running a single test

To run one test only, simply pass the file or directory to `pytest`. For example:

```
pytest tests/input/sphinx-repeat-table-rows
```

This will run one test and show the output.

### 20.5.4 Skipping tests

To skip a test, simply create a text file in the `tests/input` directory called `[test].ignore` containing a note on why the test is skipped. This will mark the test as skipped when the test suite runs. This could be useful for inherited tests that we aren't confident of the correct output for, but where we don't want to delete/lose the test entirely.

### Note

Some tests require the execution of the `dot` command, you should install the package `graphviz` from your packages manager.

## 21 Licenses

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- 
- 1 The `/etc/rst2pdf.conf` location makes sense for Linux and linux-like systems. if you are using `rst2pdf` in other systems, please contact me and tell me where the system-wide config file should be.