simpletex Documentation

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Contents

simpletex is a Python library for automatically generating LaTeX documents. It is extremely easy to use:

```
from simpletex import write, save
from simpletex.document import Document, Section, Subsection

with Document(size='11pt'):
    with Section('Section Name'):
        with Subsection('Subsection Name'):
            write('Hello World!')

save('filename.tex')
```

For a quick introduction to using simpletex, please refer to the *Tutorial*. For an overview of simpletex's functionality, please see the *Examples*.

CHAPTER 1

Getting Started

1.1 Installation Instructions

The easiest way to install simpletex is through the Python Package Index (PyPI). This can be done through the following command:

```
pip install simpletex
```

1.2 Tutorial

This tutorial covers the fundamentals, basic usage, advanced features, and third-party support of simpletex. For further usage examples, please see the *Examples*.

1.2.1 Fundamentals

The core of simpletex is the `Formatter` class; nearly all simpletex classes derive from this base class. Formatters apply formatting to (mostly) text. For example, the `Italics` formatter italicizes text. Formatters can be used by calling a `Formatter` instance.

```
>>> from simpletex.formatting.text import Italics
>>> print(Italics()('Hello World!'))
\textit{Hello World!}
```

Formatter instances can also be used as context managers. Upon exit of the `with` block, all written text is passed to the formatter.

```
>>> from simpletex import write, dump
>>> with Italics():
                write('Hello')
                write('World')
```

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```
>>> dump()
'\\textit{Hello\nWorld}'
```

1.2.2 Basic Usage

Creating Our First Document

```
from simpletex import write, save
from simpletex.document import Document

with Document():
        write('Hello World!')

save('hello_world.tex')
```

That wasn't so hard, was it?

Sections and Formatting

Let's create a document with two sections:

```
from simpletex import write, save
from simpletex.document import Document, Section

with Document():
        with Section('A'):
                write('First Section Text')
        with Section('B'):
                write('Second Section Text')

save('section_basics.tex')
```

Easy enough. Let's italicize all the section headings:

```
from simpletex import write, save
from simpletex.document import Document, Section
from simpletex.formatting.text import Italics

Section.heading.apply(Italics())

with Document():
        with Section('A'):
                write('First Section Text')
        with Section('B'):
                write('Second Section Text')

save('section_basics.tex')
```

Pretty good for two additional lines.

In the previous example, `Section.heading` is a `Style`: a `Formatter` which allows many other Formatters to be conveniently comibined.

1.3 Examples

1.3.1 Basic Usage

Python Code

```
from simpletex import write, save
from simpletex.document import Document, Section, Subsection

with Document(size='11pt'):
    with Section('Section Name'):
        with Subsection('Subsection Name'):
            write('Hello World!')

save('filename.tex')
```

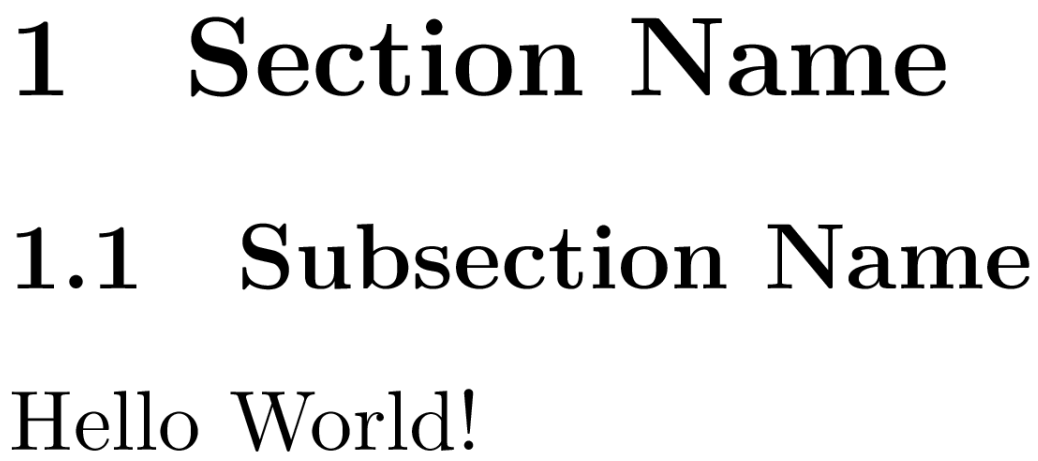
TeX Output

```
\documentclass[11pt]{article}

\usepackage[utf8]{inputenc}

\begin{document}
        \section{Section Name}
                \subsection{Subsection Name}
                        Hello World!
\end{document}
```

PDF Output



1.3.2 Simple List and Text Formatting

Python Code

```
from simpletex import write, save
from simpletex.document import Document, Section, Subsection
from simpletex.formatting.text import (Bold, Italics, Underline,
                                       Emphasis, SmallCaps)
from simpletex.sequences import OrderedList, UnorderedList

UnorderedList.bullet = '>'

with Document(size='11pt'):
    with Section('Section Name'):
        with UnorderedList():
            write(Bold()('Bold Text'))
            write(Italics()('Italic Text'))
            write(Underline()('Underlined Text'))
            with Underline():
                write('More Underlined Text')
        with Subsection('Subsection Name'):
            write('The quick brown fox jumps over the lazy dog.')
            with OrderedList():
                write(Emphasis()('Emphasized Text'))
                write(SmallCaps()('Small Caps'))

save('filename.tex')
```

TeX Output

```
\documentclass[11pt]{article}

\usepackage[utf8]{inputenc}

\begin{document}
        \section{Section Name}
                \begin{itemize}
                        \item[>] \textbf{Bold Text}
                        \item[>] \textit{Italic Text}
                        \item[>] \underline{Underlined Text}
                        \item[>] \underline{More Underlined Text}
                \end{itemize}
                \subsection{Subsection Name}
                        The quick brown fox jumps over the lazy dog.
                        \begin{enumerate}
                                \item \emph{Emphasized Text}
                                \item \textsc{Small Caps}
                        \end{enumerate}
\end{document}
```

PDF Output

1 Section Name

> **Bold Text**

> *Italic Text*

> Underlined Text

> More Underlined Text

1.1 Subsection Name

The quick brown fox jumps over the lazy dog.

1. *Emphasized Text*

2. Small Caps

1.3.3 Equations and Math

Python Code

```
from simpletex import write, save
from simpletex.document import Document, Section
from simpletex.math import (Equation,
                            Add, Subtract, Multiply, Divide)


with Document(size='11pt'):
    with Section('Inline Equations'):
        write('Example of the commutative property:')
        with Equation():
            with Multiply(symbol='x'):
                write(3)
                write(5)
```

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```
            write(Multiply(symbol='times')(5, 3))
            write(15)
    with Section('Display Equations'):
        write('If')
        with Equation():
            write('x')
            write(5)
        write('then:')
        with Equation(inline=False):
            with Divide():
                write(Add()('x', 1))
                write(3)
            write(Subtract()(7, 5))
save('filename.tex')
```

TeX Output

```
\documentclass[11pt]{article}

\usepackage[utf8]{inputenc}

\begin{document}
        \section{Inline Equations}
                Example of the commutative property:
                $3\times 5 = 5\times 3 = 15$
        \section{Display Equations}
                If
                $x = 5$
                then:
                $$\frac{x+1}{3} = 7-5$$
\end{document}
```

PDF Output

1 Inline Equations

Example of the commutative property: $3 \times 5 = 5 \times 3 = 15$

2 Display Equations

If $x = 5$ then:

$$\frac{x+1}{3} = 7 - 5$$

1.3.4 XeTeX Support and Fonts

Python Code

```
from simpletex import write, write_break, save, usepackage
from simpletex.document import Document, Section, Subsection
from simpletex.formatting import Style
from simpletex.formatting.font import Font
from simpletex.formatting.text import Italics, SmallCaps
from simpletex.formatting.layout import Centering

title = Style()
title.apply(Font('Bebas Neue Bold', size=40))

subtitle = Style()
subtitle.apply(Font('Times New Roman', size=11))

Section.heading.apply(Font('Open Sans Semibold', size=16))

Subsection.heading.apply(Font('Open Sans Semibold', size=12))
Subsection.heading.apply(Italics())
Subsection.heading.apply(Centering())

usepackage('geometry', margin='0.5in')
with Document(size='11pt'):
        with Centering():
                write_break(title('Example Title Text'))
                with subtitle:
                        write_break("Example Subtitle Text")
                        write_break("More Subtitle Text")
        with Section('Section Name'):
                write('Example section text.')
                write(SmallCaps()('Lorem ipsum dolor si amet.'))
                with Subsection('Subsection Name'):
                        write('Hello World!')

save('filename.tex')
```

TeX Output

```
\documentclass[11pt]{article}

\usepackage[margin=0.5in]{geometry}
\usepackage[utf8]{inputenc}
\usepackage{fontspec}
\usepackage{xltxtra}
\usepackage{anyfontsize}
\usepackage{titlesec}

\newfontfamily\BebasNeueBold[Mapping=tex-text]{Bebas Neue Bold}
\newfontfamily\TimesNewRoman[Mapping=tex-text]{Times New Roman}
\newfontfamily\OpenSansSemibold[Mapping=tex-text]{Open Sans Semibold}

\titleformat*{\subsection}{\centering\itshape\fontsize{12}{15}\OpenSansSemibold }
\titleformat*{\section}{\fontsize{16}{20}\OpenSansSemibold }
```

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```
\begin{document}
        \begin{center}
                {\fontsize{40}{52}\BebasNeueBold Example Title Text} \\
                {\fontsize{11}{14}\TimesNewRoman Example Subtitle Text \\
                More Subtitle Text \\}
        \end{center}
        \section{Section Name}
                Example section text.
                \textsc{Lorem ipsum dolor si amet.}
                \subsection{Subsection Name}
                        Hello World!
\end{document}
```

PDF Output

EXAMPLE TITLE TEXT

Example Subtitle Text
More Subtitle Text

1 Section Name

Example section text. Lorem ipsum dolor si amet.

1.1 Subsection Name

Hello World!

CHAPTER 2

API Documentation

2.1 Core LaTeX

This section documents simpletex's core LaTeX functionality.

2.1.1 Document Structure

This module provides utilities to define a document's basic structure.

class simpletex.document.**Document**(*document_class: str = 'article'*, *size: str = '12pt'*)
Bases: simpletex.base.Environment

A class which manages a LaTeX document.

Upon instantiation, sets the input encoding to UTF-8 and declares the document class. This class does NOT manage the preamble (imports, newcommand declarations, etc.). The preamble is managed by the *simpletex.Preamble* class.

Create an empty document using the given document class and font size.

document_class [str] The LaTeX document class name to use.

size [str] The default font size to use.

class simpletex.document.**Section**(*name: str*)
Bases: simpletex.document.Title

Represents a LaTeX section.

Create an empty section with the given name.

name [str] The section name.

class simpletex.document.**Subsection**(*name: str*)
Bases: simpletex.document.Title

Represents a LaTeX subsection.

Create an empty subsection with the given name.

name [str] The subsection name.

2.1.2 Text Formatting

This module provides formatters to perform basic text formatting.

class simpletex.formatting.text.**Bold**(*inline: bool = False*)
Bases: simpletex.formatting.text.SimpleFormatter

Applies bold formatting to text.

Create a new bold formatter.

inline [bool] If true, the inline (\bfshape) version of the formatter is used. Otherwise, use the default (\textbf{}) version.

class simpletex.formatting.text.**Italics**(*inline: bool = False*)
Bases: simpletex.formatting.text.SimpleFormatter

Applies italic formatting to text.

Create a new italics formatter.

inline [bool] If true, the inline (\itshape) version of the formatter is used. Otherwise, use the default (\textit{}) version.

class simpletex.formatting.text.**Underline**
Bases: simpletex.formatting.text.SimpleFormatter

Applies underline formatting to text.

Create a new underline formatter.

Note that inline formatting is not supported for underlines.

class simpletex.formatting.text.**SmallCaps**(*inline: bool = False*)
Bases: simpletex.formatting.text.SimpleFormatter

Applies small capital formatting to text.

Create a new small capital formatter.

inline [bool] If true, the inline (\scshape) version of the formatter is used. Otherwise, use the default (\textsc{}) version.

class simpletex.formatting.text.**Emphasis**(*inline: bool = False*)
Bases: simpletex.formatting.text.SimpleFormatter

Applies emphasis formatting to text.

Create a new emphasis formatter.

inline [bool] If true, the inline (\em) version of the formatter is used. Otherwise, use the default (\emph{}) version.

2.1.3 Lists and Sequences

This module provides formatters to create sequences and lists.

class simpletex.sequences.**OrderedList**
Bases: simpletex.base.Environment

Formats a given list of text as a numbered LaTeX list.

Equivalent to the LaTeX `enumerate` environment.

Create an empty numbered list.

class simpletex.sequences.**UnorderedList**
Bases: simpletex.base.Environment

Formats a given list of text as a bulleted LaTeX list.

Equivalent to the LaTeX `itemize` environment.

Create an empty bulleted list.

class simpletex.sequences.**Description**
Bases: simpletex.base.Environment

Formats a given list of key-value pairs as a LaTeX description list.

Equivalent to the LaTeX `description` environment.

Create an empty description list.

2.1.4 Document Layout

This module provides formatters to control document and text layout.

class simpletex.formatting.layout.**Centering**(*inline: bool = False*)
Bases: simpletex.base.Environment

Centers all contents.

Equivalent to the LaTeX `center` environment.

Create a new centering formatter.

inline [bool] If true, the inline (`\centering`) version of the formatter is used. Otherwise, use the default (`\begin{center}`) version.

class simpletex.formatting.layout.**Columns**(*number: int*)
Bases: simpletex.base.Environment

Formats contents into columns.

Equivalent to the LaTeX `multicols` environment.

Create a new `multicols` environment.

Automatically imports the required `multicol` package.

number [int] The number of columns to use.

2.1.5 Equations and Mathematics

This module provides formatters to create and display LaTeX equations.

class simpletex.math.**Equation**(*inline: bool = True*)
Bases: simpletex.core.Formatter

Formats text as a LaTeX equation.

Initialize an empty equation.

inline [bool] Chooses the equation format to use. If `True`, use the inline (`$`) syntax. If `False`, use the display-style (`$$`) syntax.

class simpletex.math.**Add**
Bases: simpletex.math.Operator

Adds arguments together in symbolic form.

Initialize an empty addition operator.

class simpletex.math.**Subtract**(*inline: bool = False*)
Bases: simpletex.math.Operator

Subtracts two given arguments in symbolic form.

Initialize an empty subtraction operator.

class simpletex.math.**Multiply**(*symbol='dot'*)
Bases: simpletex.math.Operator

Multiplies arguments together in symbolic form.

Initialize an empty multiplication operator.

symbol [str or None] Chooses the multiplication symbol to use. If `None`, no explicit symbol is used. If '.' or 'dot', a dot-style (`\cdot`) operator is used. If 'x', 'cross', or 'times', a cross-style (`\times`) operator is used. If '*' or 'star', a star-style (`*`) operator is used.

class simpletex.math.**Divide**(*inline: bool = False*)
Bases: simpletex.math.Operator

Divides two given arguments in symbolic form.

Initialize an empty division operator.

inline [bool] Chooses division format to use. If `False`, use the display-style (`\frac{}{}`) syntax. If `True`, use the inline (`/`) syntax.

class simpletex.math.**Matrix**(*brackets: str = '['*)
Bases: simpletex.base.Environment

Represents a matrix.

Can be contstructed either with nested lists or a 2D numpy array. Numpy is not requred.

Create a new empty matrix.

The type of brackets to use can be specified. Automatically imports the required package `amsmath`.

brackets [str] Type of brackets to use. Supported options are `''` (no brackets), `'('`, `'['`, `'{'`, `'|'`, and `'||'`.

2.2 XeTeX Font Support

This section documents simpletex's support for XeTeX's font customization features.

2.2.1 Font Formatting

This module provides formatters to change the font and size of text.

class simpletex.formatting.font.**Font**(*name: str*, *size: int = None*, *skip: int = None*, *inline: bool = False*)

Bases: simpletex.core.Formatter

Changes the font face (and optionally the size) of text.

Imports the required packages fontspec and xltxtra upon instantiation. If used, the document must be processed with XeTeX or another font-aware TeX processor.

Create a new font formatter using the given font name and size.

name [str] The name of the font to use.

size [int] The font size to use, in pt. If size is None, the font size will not be changed.

skip [int] The line skip to use in pt. If skip is not provided, but size is specified, automatically calculate the skip according to `skip = int(size*1.3)`.

inline [bool] If `True`, the inline (TeX directive) version of the formatter is used. Otherwise, use the command form.

class simpletex.formatting.font.**SizeSelector**(*size: int*, *skip: int = None*)

Bases: simpletex.core.Formatter

Changes the font size of text.

Allows specifying an optional skip parameter. Imports the required package anyfontsize on instantiation.

Create a new font size formatter with the given size and skip.

Automatically imports the required package anyfontsize.

size [int] The font size to use, in pt. If size is None, the formatter will do nothing.

skip [int] The line skip to use in pt. If skip is not provided, but size is specified, automatically calculate the skip according to `skip = int(size*1.3)`.

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