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# **latexcodec Documentation**

***Release 1.0.2***

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## 1.1 Getting Started

### 1.1.1 Overview

A lexer and codec to work with LaTeX code in Python.

- Download: <http://pypi.python.org/pypi/latexcodec/#downloads>
- Documentation: <http://latexcodec.readthedocs.org/>
- Development: <http://github.com/mcmtrouffes/latexcodec/>

### 1.1.2 Installation

Install the module with `pip install latexcodec`, or from source using `python setup.py install`.

### 1.1.3 Minimal Example

Simply import the `latexcodec` module to enable "latex" to be used as an encoding:

```
import latexcodec
text_latex = b'\\'el\\'eve"
assert text_latex.decode("latex") == u"élève"
text_unicode = u"ångström"
assert text_unicode.encode("latex") == b'\\aa ngstr\\"om'
```

There are also a `ulatex` encoding for text transforms. The simplest way to use this codec goes through the `codecs` module (as for all text transform codecs on Python):

```
import codecs
import latexcodec
text_latex = u'\\'el\\'eve"
assert codecs.decode(text_latex, "ulatex") == u"élève"
text_unicode = u"ångström"
assert codecs.encode(text_unicode, "ulatex") == u'\\aa ngstr\\"om'
```

By default, the LaTeX input is assumed to be `ascii`, as per standard LaTeX. However, you can also specify an extra codec as `latex+<encoding>` or `ulatex+<encoding>`, where `<encoding>` describes another encoding. In this case characters will be translated to and from that encoding whenever possible. The following code snippet demonstrates this behaviour:

```
import latexcodec
text_latex = b"\xfe"
assert text_latex.decode("latex+latin1") == u"þ"
assert text_latex.decode("latex+latin2") == u"ţ"
text_unicode = u"ţ"
assert text_unicode.encode("latex+latin1") == b'\\c t' # ţ is not latin1
assert text_unicode.encode("latex+latin2") == b'\xfe' # but it is latin2
```

## 1.1.4 Limitations

- Not all unicode characters are registered. If you find any missing, please report them on the tracker: <https://github.com/mcmtroffaes/latexcodec/issues>
- Unicode combining characters are currently not handled.
- By design, the codec never removes curly brackets. This is because it is very hard to guess whether brackets are part of a command or not (this would require a full latex parser). Moreover, bibtex uses curly brackets as a guard against case conversion, in which case automatic removal of curly brackets may not be desired at all, even if they are not part of a command. Also see: <http://stackoverflow.com/a/19754245/2863746>

## 1.2 API

### 1.2.1 LaTeX Codec

The `latexcodec.codec` module contains all classes and functions for LaTeX code translation. For practical use, you should only ever need to import the `latexcodec` module, which will automatically register the codec so it can be used by `str.encode()`, `str.decode()`, and any of the functions defined in the `codecs` module such as `codecs.open()` and so on. The other functions and classes are exposed in case someone would want to extend them.

`latexcodec.codec.register()`

Register the `find_latex()` codec search function.

See also:

`codecs.register()`

`latexcodec.codec.find_latex(encoding)`

Return a `codecs.CodecInfo` instance for the requested LaTeX *encoding*, which must be equal to `latex`, or to `latex+<encoding>` where `<encoding>` describes another encoding.

**class** `latexcodec.codec.LatexIncrementalEncoder(errors='strict')`

Bases: `latexcodec.lexer.LatexIncrementalEncoder`

Translating incremental encoder for latex. Maintains a state to determine whether control spaces etc. need to be inserted.

**get\_space\_bytes** (*bytes\_*)

Inserts space bytes in space eating mode.

**class** `latexcodec.codec.LatexIncrementalDecoder(errors='strict')`

Bases: `latexcodec.lexer.LatexIncrementalDecoder`

Translating incremental decoder for LaTeX.

**class** `latexcodec.codec.LatexCodec`

Bases: `codecs.Codec`



**decode** (*bytes\_*, *errors*='strict')  
Convert LaTeX bytes to unicode string.

**encode** (*unicode\_*, *errors*='strict')  
Convert unicode string to LaTeX bytes.

**class** latexcodec.codec.**LatexUnicodeTable** (*lexer*)  
Tabulates a translation between LaTeX and unicode.

**register** (*unicode\_text*, *latex\_text*, *mode*='text', *package*=None, *decode*=True, *encode*=True)  
Register a correspondence between *unicode\_text* and *latex\_text*.

#### Parameters

- **unicode\_text** (*str*) – A unicode character.
- **latex\_text** (*bytes*) – Its corresponding LaTeX translation.
- **mode** (*str*) – LaTeX mode in which the translation applies ('text' or 'math').
- **package** (*str*) – LaTeX package requirements (currently ignored).
- **decode** (*bool*) – Whether this translation applies to decoding (default: True).
- **encode** (*bool*) – Whether this translation applies to encoding (default: True).

**register\_all** ()  
Register all symbols and their LaTeX equivalents (called by constructor).

## 1.2.2 LaTeX Lexer

This module contains all classes for lexing LaTeX code, as well as general purpose base classes for incremental LaTeX decoders and encoders, which could be useful in case you are writing your own custom LaTeX codec.

**class** latexcodec.lexer.**Token** (*name*, *text*)  
Token(name, text)

**class** latexcodec.lexer.**LatexLexer** (*errors*='strict')  
Bases: latexcodec.lexer.RegexpLexer  
A very simple lexer for tex/latex bytes.

**class** latexcodec.lexer.**LatexIncrementalLexer** (*errors*='strict')  
Bases: *latexcodec.lexer.LatexLexer*

A very simple incremental lexer for tex/latex code. Roughly follows the state machine described in Tex By Topic, Chapter 2.

The generated tokens satisfy:

- no newline characters: paragraphs are separated by 'par'
- spaces following control tokens are compressed

**get\_tokens** (*bytes\_*, *final*=False)  
Yield tokens while maintaining a state. Also skip whitespace after control words and (some) control symbols. Replaces newlines by spaces and par commands depending on the context.

**class** latexcodec.lexer.**LatexIncrementalDecoder** (*errors*='strict')  
Bases: *latexcodec.lexer.LatexIncrementalLexer*

Simple incremental decoder. Transforms lexed LaTeX tokens into unicode.

To customize decoding, subclass and override *get\_unicode\_tokens* ().

**decode** (*bytes\_*, *final=False*)

Decode LaTeX *bytes\_* into a unicode string.

This implementation calls `get_unicode_tokens()` and joins the resulting unicode strings together.

**decode\_token** (*token*)

Returns the decoded token text in `inputenc` encoding.

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**Note:** Control words get an extra space added at the back to make sure separation from the next token, so that decoded token sequences can be `str.join()` ed together.

For example, the tokens `b'\hello'` and `b'world'` will correctly result in `u'\hello world'` (remember that LaTeX eats space following control words). If no space were added, this would wrongfully result in `u'\helloworld'`.

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**get\_unicode\_tokens** (*bytes\_*, *final=False*)

Decode every token in `inputenc` encoding. Override to process the tokens in some other way (for example, for token translation).

**class** `latexcodec.lexer.LatexIncrementalEncoder` (*errors='strict'*)

Bases: `codecs.IncrementalEncoder`

Simple incremental encoder for LaTeX. Transforms unicode into bytes.

To customize decoding, subclass and override `get_latex_bytes()`.

**encode** (*unicode\_*, *final=False*)

Encode the *unicode\_* string into LaTeX bytes.

This implementation calls `get_latex_bytes()` and joins the resulting bytes together.

**flush\_unicode\_tokens** ()

Flush the buffer.

**get\_latex\_bytes** (*unicode\_*, *final=False*)

Encode every character in `inputenc` encoding. Override to process the unicode in some other way (for example, for character translation).

**get\_unicode\_tokens** (*unicode\_*, *final=False*)

Split unicode into tokens so that every token starts with a non-combining character.

**getstate** ()

Get state.

**reset** ()

Reset state.

**setstate** (*state*)

Set state. The *state* must correspond to the return value of a previous `getstate()` call.

## 1.3 Changes

### 1.3.1 1.0.2 (1 March 2016)

- New `ulatex` codec which works as a text transform on unicode strings.
- Fix spacing when translating math (see issue #29, reported by beltiste).
- Performance improvements in latex to unicode translation.

- Support old-style math mode (see pull request #40, contributed by xuhdev).
- Treat tab character as a space character (see discussion in issue #40, raised by xuhdev).

### 1.3.2 1.0.1 (24 September 2014)

- br“\par” is now decoded using two newlines (see issue #26, reported by Jorrit Wronski).
- Fix encoding and decoding of the ogonek (see issue #24, reported by beltiste).

### 1.3.3 1.0.0 (5 August 2014)

- Add Python 3.4 support.
- Fix “DZ” decoding (see issue #21, reported and fixed by Philipp Spitzer).

### 1.3.4 0.3.2 (17 April 2014)

- Fix underscore “\\_” encoding (see issue #17, reported and fixed by Michael Radziej).

### 1.3.5 0.3.1 (5 February 2014)

- Drop Python 3.2 support.
- Drop 2to3 and instead use six to support both Python 2 and 3 from a single code base.
- Fix control space “\ ” decoding.
- Fix LaTeX encoding of number sign “#” and other special ascii characters (see issues #11 and #13, reported by beltiste).

### 1.3.6 0.3.0 (19 August 2013)

- Copied lexer and codec from sphinxcontrib-bibtex.
- Initial usage and API documentation.
- Some small bugs fixed.

### 1.3.7 0.2 (28 September 2012)

- Adding additional codec with brackets around special characters.

### 1.3.8 0.1 (26 May 2012)

- Initial release.

## 1.4 Authors

Main authors:

- David Eppstein
  - wrote the original LaTeX codec as a recipe on ActiveState <http://code.activestate.com/recipes/252124-latex-codec/>
- Peter Tröger
  - wrote the original latexcodec package, which contained a simple but very effective LaTeX encoder
- Matthias Troffaes ([matthias.troffaes@gmail.com](mailto:matthias.troffaes@gmail.com))
  - wrote the lexer
  - integrated codec with the lexer for a simpler and more robust design
  - various bugfixes

Contributors:

- Michael Radziej
- Philipp Spitzer

## 1.5 License

latexcodec is a lexer and codec to work with LaTeX code in Python

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### Remark

Versions 0.1 and 0.2 of the latexcodec package were written by Peter Tröger, and were released under the Academic Free License 3.0. The current version of the latexcodec package shares no code with those earlier versions.

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