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# **mwparserfromhell Documentation**

***Release 0.6.2***

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`mwparserfromhell` (the *MediaWiki Parser from Hell*) is a Python package that provides an easy-to-use and outrageously powerful parser for [MediaWiki](#) wikicode. It supports Python 3.5+.

Developed by [Earwig](#) with contributions from [Σ](#), [Legoktm](#), and others. Development occurs on [GitHub](#).



# CHAPTER 1

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## Installation

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The easiest way to install the parser is through the [Python Package Index](#); you can install the latest release with `pip install mwparserfromhell` (get [pip](#)). Make sure your `pip` is up-to-date first, especially on Windows.

Alternatively, get the latest development version:

```
git clone https://github.com/earwig/mwparserfromhell.git
cd mwparserfromhell
python setup.py install
```

The comprehensive unit testing suite requires [pytest](#) (`pip install pytest`) and can be run with `python -m pytest`.





## 2.1 Usage

Normal usage is rather straightforward (where `text` is page text):

```
>>> import mwparserfromhell
>>> wikicode = mwparserfromhell.parse(text)
```

`wikicode` is a `mwparserfromhell.Wikicode` object, which acts like an ordinary `str` object with some extra methods. For example:

```
>>> text = "I has a template! {{foo|bar|baz|eggs=spam}} See it?"
>>> wikicode = mwparserfromhell.parse(text)
>>> print(wikicode)
I has a template! {{foo|bar|baz|eggs=spam}} See it?
>>> templates = wikicode.filter_templates()
>>> print(templates)
['{{foo|bar|baz|eggs=spam}}']
>>> template = templates[0]
>>> print(template.name)
foo
>>> print(template.params)
['bar', 'baz', 'eggs=spam']
>>> print(template.get(1).value)
bar
>>> print(template.get("eggs").value)
spam
```

Since nodes can contain other nodes, getting nested templates is trivial:

```
>>> text = "{{foo|{{bar}}={{baz|{{spam}}}}}"
>>> mwparserfromhell.parse(text).filter_templates()
['{{foo|{{bar}}={{baz|{{spam}}}}}', '{{bar}}', '{{baz|{{spam}}}}', '{{spam}}']
```

You can also pass `recursive=False` to `filter_templates()` and explore templates manually. This is possible because nodes can contain additional *Wikicode* objects:

```
>>> code = mwparserfromhell.parse("{{foo|this {{includes a|template}}}}")
>>> print(code.filter_templates(recursive=False))
['{{foo|this {{includes a|template}}}}']
>>> foo = code.filter_templates(recursive=False)[0]
>>> print(foo.get(1).value)
this {{includes a|template}}
>>> print(foo.get(1).value.filter_templates()[0])
{{includes a|template}}
>>> print(foo.get(1).value.filter_templates()[0].get(1).value)
template
```

Templates can be easily modified to add, remove, or alter params. *Wikicode* objects can be treated like lists, with `append()`, `insert()`, `remove()`, `replace()`, and more. They also have a `matches()` method for comparing page or template names, which takes care of capitalization and whitespace:

```
>>> text = "{{cleanup}} ''Foo'' is a [[bar]]. {{uncategorized}}"
>>> code = mwparserfromhell.parse(text)
>>> for template in code.filter_templates():
...     if template.name.matches("Cleanup") and not template.has("date"):
...         template.add("date", "July 2012")
...
>>> print(code)
{{cleanup|date=July 2012}} ''Foo'' is a [[bar]]. {{uncategorized}}
>>> code.replace("{{uncategorized}}", "{{bar-stub}}")
>>> print(code)
{{cleanup|date=July 2012}} ''Foo'' is a [[bar]]. {{bar-stub}}
>>> print(code.filter_templates())
['{{cleanup|date=July 2012}}', '{{bar-stub}}']
```

You can then convert `code` back into a regular `str` object (for saving the page!) by calling `str()` on it:

```
>>> text = str(code)
>>> print(text)
{{cleanup|date=July 2012}} ''Foo'' is a [[bar]]. {{bar-stub}}
>>> text == code
True
```

For more tips, check out *Wikicode's full method list* and the *list of Nodes*.

## 2.2 Limitations

While the MediaWiki parser generates HTML and has access to the contents of templates, among other things, `mw-parserfromhell` acts as a direct interface to the source code only. This has several implications:

- Syntax elements produced by a template transclusion cannot be detected. For example, imagine a hypothetical page "Template:End-bold" that contained the text `</b>`. While MediaWiki would correctly understand that `<b>foobar{{end-bold}}</b>` translates to `<b>foobar</b>`, `mwparserfromhell` has no way of examining the contents of `{{end-bold}}`. Instead, it would treat the bold tag as unfinished, possibly extending further down the page.
- Templates adjacent to external links, as in `http://example.com{{foo}}`, are considered part of the link. In reality, this would depend on the contents of the template.

- When different syntax elements cross over each other, as in `{{echo|'Hello}}, world!'`, the parser gets confused because this cannot be represented by an ordinary syntax tree. Instead, the parser will treat the first syntax construct as plain text. In this case, only the italic tag would be properly parsed.

**Workaround:** Since this commonly occurs with text formatting and text formatting is often not of interest to users, you may pass `skip_style_tags=True` to `mwparserfromhell.parse()`. This treats `'` and `'` as plain text.

A future version of `mwparserfromhell` may include multiple parsing modes to get around this restriction more sensibly.

Additionally, the parser lacks awareness of certain wiki-specific settings:

- **Word-ending links** are not supported, since the `linktrail` rules are language-specific.
- Localized namespace names aren't recognized, so file links (such as `[[File:...]]`) are treated as regular wikilinks.
- Anything that looks like an XML tag is treated as a tag, even if it is not a recognized tag name, since the list of valid tags depends on loaded MediaWiki extensions.

## 2.3 Integration

`mwparserfromhell` is used by and originally developed for [EarwigBot](#); Page objects have a `parse()` method that essentially calls `mwparserfromhell.parse()` on `get()`.

If you're using [Pywikibot](#), your code might look like this:

```
import mwparserfromhell import pywikibot

def parse(title):
    site = pywikibot.Site()
    page = pywikibot.Page(site, title)
    text = page.get()
    return mwparserfromhell.parse(text)
```

If you're not using a library, you can parse any page with the following Python 3 code (using the [API](#) and the [requests](#) library):

```
import mwparserfromhell import requests

API_URL = "https://en.wikipedia.org/w/api.php"

def parse(title):
    params = {
        "action": "query",
        "prop": "revisions",
        "rvprop": "content",
        "rvslots": "main",
        "rvlimit": 1,
        "titles": title,
        "format": "json",
        "formatversion": "2",
    }
    headers = {"User-Agent": "My-Bot-Name/1.0"}
    req = requests.get(API_URL, headers=headers, params=params)
    res = req.json()
    revision = res["query"]["pages"][0]["revisions"][0]
    text = revision["slots"]["main"]["content"]
    return mwparserfromhell.parse(text)
```

## 2.4 Changelog

### 2.4.1 v0.6.2

Released May 16, 2021 (changes):

- Improved parsing of external links. (#232)
- Fixed parsing of nested wikilinks.

- Ported tests to pytest. (#237)
- Moved mwparserfromhell package to src/ dir.
- There was no 0.6.1 release due to a packaging error.

## 2.4.2 v0.6

Released December 21, 2020 (changes):

Thanks to everyone for their patience with this release!

- Breaking change: dropped support for end-of-life Python 2.7 and 3.4.
- Added support for Python 3.8 and 3.9.
- Added binary wheels for Linux and macOS.
- Updated `Wikicode.matches()` to recognize underscores as being equivalent to spaces. (#216)
- Added a `default` parameter to `Template.get()`, and implement dict-style item access for template parameters. (#252)
- Fixed a rare parsing bug involving deeply nested style tags. (#224)
- Fixed parsing of section headings inside templates. (#233)
- Updated HTML tag definitions.
- Internal refactoring and cleanup.

## 2.4.3 v0.5.4

Released May 15, 2019 (changes):

- Fixed an unlikely crash in the C tokenizer when interrupted while parsing a heading.

## 2.4.4 v0.5.3

Released March 30, 2019 (changes):

- Fixed manual construction of Node objects, previously unsupported. (#214)
- Fixed `Wikicode` transformation methods (`Wikicode.replace()`, `Wikicode.remove()`, etc.) when passed an empty section as an argument. (#212)
- Fixed the parser getting stuck inside malformed tables. (#206)

## 2.4.5 v0.5.2

Released November 1, 2018 (changes):

- Dropped support for end-of-life Python versions 2.6, 3.2, 3.3. (#199, #204)
- Fixed signals getting stuck inside the C tokenizer until parsing finishes, in pathological cases. (#206)
- Fixed `<wbr>` not being considered a single-only tag. (#200)
- Fixed a C tokenizer crash on Python 3.7 when compiled with assertions. (#208)
- Cleaned up some minor documentation issues. (#207)

## 2.4.6 v0.5.1

Released March 3, 2018 (changes):

- Improved behavior when adding parameters to templates (via `Template.add()`) with poorly formatted whitespace conventions. (#185)
- Fixed the parser getting stuck in deeply nested HTML tags with unclosed, quoted attributes. (#190)

## 2.4.7 v0.5

Released June 23, 2017 (changes):

- Added `Wikicode.contains()` to determine whether a `Node` or `Wikicode` object is contained within another `Wikicode` object.
- Added `Wikicode.get_ancestors()` and `Wikicode.get_parent()` to find all ancestors and the direct parent of a `Node`, respectively.
- Fixed a long-standing performance issue with deeply nested, invalid syntax (issue #42). The parser should be much faster on certain complex pages. The “max cycle” restriction has also been removed, so some situations where templates at the end of a page were being skipped are now resolved.
- Made `Template.remove(keep_field=True)` behave more reasonably when the parameter is already empty.
- Added the `keep_template_params` argument to `Wikicode.strip_code()`. If `True`, then template parameters will be preserved in the output.
- `Wikicode` objects can now be pickled properly (fixed infinite recursion error on incompletely-constructed `StringMixin` subclasses).
- Fixed `Wikicode.matches()`’s behavior on iterables besides lists and tuples.
- Fixed `len()` sometimes raising `ValueError` on empty node lists.
- Fixed a rare parsing bug involving self-closing tags inside the attributes of unpaired tags.
- Fixed release script after changes to PyPI.

## 2.4.8 v0.4.4

Released December 30, 2016 (changes):

- Added support for Python 3.6.
- Fixed parsing bugs involving:
  - wikipables nested in templates;
  - wikipable error recovery when unable to recurse;
  - templates nested in template parameters before other parameters.
- Fixed parsing file-like objects.
- Made builds deterministic.
- Documented caveats.

### 2.4.9 v0.4.3

Released October 29, 2015 (changes):

- Added Windows binaries for Python 3.5.
- Fixed edge cases involving wikilinks inside of external links and vice versa.
- Fixed a C tokenizer crash when a keyboard interrupt happens while parsing.

### 2.4.10 v0.4.2

Released July 30, 2015 (changes):

- Fixed setup script not including header files in releases.
- Fixed Windows binary uploads.

### 2.4.11 v0.4.1

Released July 30, 2015 (changes):

- The process for building Windows binaries has been fixed, and these should be distributed along with new releases. Windows users can now take advantage of C speedups without having a compiler of their own.
- Added support for Python 3.5.
- `<` and `>` are now disallowed in wikilink titles and template names. This includes when denoting tags, but not comments.
- Fixed the behavior of *preserve\_spacing* in `Template.add()` and *keep\_field* in `Template.remove()` on parameters with hidden keys.
- Removed `_ListProxy.detach()`. *SmartLists* now use weak references and their children are garbage-collected properly.
- Fixed parser bugs involving:
  - templates with completely blank names;
  - templates with newlines and comments.
- Heavy refactoring and fixes to the C tokenizer, including:
  - corrected a design flaw in text handling, allowing for substantial speed improvements when parsing long strings of plain text;
  - implemented new Python 3.3 [PEP 393](#) Unicode APIs.
- Fixed various bugs in *SmartList*, including one that was causing memory issues on 64-bit builds of Python 2 on Windows.
- Fixed some bugs in the release scripts.

### 2.4.12 v0.4

Released May 23, 2015 (changes):

- The parser now falls back on pure Python mode if C extensions cannot be built. This fixes an issue that prevented some Windows users from installing the parser.

- Added support for parsing wikicode tables (patches by David Winegar).
- Added a script to test for memory leaks in `scripts/memtest.py`.
- Added a script to do releases in `scripts/release.sh`.
- `skip_style_tags` can now be passed to `mwparserfromhell.parse()` (previously, only `Parser.parse()` allowed it).
- The `recursive` argument to `Wikicode's filter()` methods now accepts a third option, `RECURSE_OTHERS`, which recurses over all children except instances of *forcetype* (for example, `code.filter_templates(code.RECURSE_OTHERS)` returns all un-nested templates).
- The parser now understands HTML tag attributes quoted with single quotes. When setting a tag attribute's value, quotes will be added if necessary. As part of this, *Attribute's* quoted attribute has been changed to *quotes*, and is now either a string or `None`.
- Calling `Template.remove()` with a *Parameter* object that is not part of the template now raises `ValueError` instead of doing nothing.
- *Parameters* with non-integer keys can no longer be created with `showkey=False`, nor have the value of this attribute be set to `False` later.
- `_ListProxy.destroy()` has been changed to `_ListProxy.detach()`, and now works in a more useful way.
- If something goes wrong while parsing, `ParserError` will now be raised. Previously, the parser would produce an unclear *BadRoute* exception or allow an incorrect node tree to be build.
- Fixed parser bugs involving:
  - nested tags;
  - comments in template names;
  - tags inside of `<nowiki>` tags.
- Added tests to ensure that parsed trees convert back to wikicode without unintentional modifications.
- Added support for a `NOWEB` environment variable, which disables a unit test that makes a web call.
- Test coverage has been improved, and some minor related bugs have been fixed.
- Updated and fixed some documentation.

### 2.4.13 v0.3.3

Released April 22, 2014 (changes):

- Added support for Python 2.6 and 3.4.
- `Template.has()` is now passed `ignore_empty=False` by default instead of `True`. This fixes a bug when adding parameters to templates with empty fields, **and is a breaking change if you rely on the default behavior**.
- The `matches` argument of `Wikicode's filter()` methods now accepts a function (taking one argument, a *Node*, and returning a bool) in addition to a regex.
- Re-added `flat` argument to `Wikicode.get_sections()`, fixed the order in which it returns sections, and made it faster.
- `Wikicode.matches()` now accepts a tuple or list of strings/*Wikicode* objects instead of just a single string or *Wikicode*.

- Given the frequency of issues with the (admittedly insufficient) tag parser, there's a temporary *skip\_style\_tags* argument to *parse()* that ignores `' '` and `' '` until these issues are corrected.
- Fixed a parser bug involving nested wikilinks and external links.
- C code cleanup and speed improvements.

## 2.4.14 v0.3.2

Released September 1, 2013 (changes):

- Added support for Python 3.2 (along with current support for 3.3 and 2.7).
- Renamed *Template.remove()*'s first argument from *name* to *param*, which now accepts *Parameter* objects in addition to parameter name strings.

## 2.4.15 v0.3.1

Released August 29, 2013 (changes):

- Fixed a parser bug involving URLs nested inside other markup.
- Fixed some typos.

## 2.4.16 v0.3

Released August 24, 2013 (changes):

- Added complete support for HTML *Tags*, including forms like `<ref>foo</ref>`, `<ref name="bar"/>`, and wiki-markup tags like bold (`' '`), italics (`' '`), and lists (`*`, `#`, `;` and `:`).
- Added support for *ExternalLinks* (`http://example.com/` and `[http://example.com/Example]`).
- *Wikicode*'s *filter()* methods are now passed *recursive=True* by default instead of *False*. **This is a breaking change if you rely on any *filter()* methods being non-recursive by default.**
- Added a *matches()* method to *Wikicode* for page/template name comparisons.
- The *obj* param of *Wikicode.insert\_before()*, *insert\_after()*, *replace()*, and *remove()* now accepts *Wikicode* objects and strings representing parts of wikitext, instead of just nodes. These methods also make all possible substitutions instead of just one.
- Renamed *Template.has\_param()* to *has()* for consistency with *Template*'s other methods; *has\_param()* is now an alias.
- The C tokenizer extension now works on Python 3 in addition to Python 2.7.
- Various bugfixes, internal changes, and cleanup.

## 2.4.17 v0.2

Released June 20, 2013 (changes):

- The parser now fully supports Python 3 in addition to Python 2.7.
- Added a C tokenizer extension that is significantly faster than its Python equivalent. It is enabled by default (if available) and can be toggled by setting `mwparserfromhell.parser.use_c` to a boolean value.



- Added a complete set of unit tests covering parsing and wikicode manipulation.
- Renamed `filter_links()` to `filter_wikilinks()` (applies to `ifilter()` as well).
- Added filter methods for *Arguments*, *Comments*, *Headings*, and *HTMLEntities*.
- Added *before* param to `Template.add()`; renamed *force\_nonconformity* to *preserve\_spacing*.
- Added *include\_lead* param to `Wikicode.get_sections()`.
- Removed *flat* param from `get_sections()`.
- Removed *force\_no\_field* param from `Template.remove()`.
- Added support for Travis CI.
- Added note about Windows build issue in the README.
- The tokenizer will limit itself to a realistic recursion depth to prevent errors and unreasonably long parse times.
- Fixed how some nodes' attribute setters handle input.
- Fixed multiple bugs in the tokenizer's handling of invalid markup.
- Fixed bugs in the implementation of *SmartList* and *StringMixIn*.
- Fixed some broken example code in the README; other copyedits.
- Other bugfixes and code cleanup.

## 2.4.18 v0.1.1

Released September 21, 2012 (changes):

- Added support for *Comments* (`<!-- foo -->`) and *Wikilinks* (`[[foo]]`).
- Added corresponding `ifilter_links()` and `filter_links()` methods to *Wikicode*.
- Fixed a bug when parsing incomplete templates.
- Fixed `strip_code()` to affect the contents of headings.
- Various copyedits in documentation and comments.

## 2.4.19 v0.1

Released August 23, 2012:

- Initial release.

# 2.5 mwparserfromhell

## 2.5.1 mwparserfromhell Package

### **mwparserfromhell Package**

`mwparserfromhell` (the MediaWiki Parser from Hell) is a Python package that provides an easy-to-use and outrageously powerful parser for MediaWiki wikicode.

## definitions Module

Contains data about certain markup, like HTML tags and external links.

When updating this file, please also update the the C tokenizer version: - mwparserfromhell/parser/ctokenizer/definitions.c - mwparserfromhell/parser/ctokenizer/definitions.h

`mwparserfromhell.definitions.get_html_tag(markup)`

Return the HTML tag associated with the given wiki-markup.

`mwparserfromhell.definitions.is_parsable(tag)`

Return if the given *tag*'s contents should be passed to the parser.

`mwparserfromhell.definitions.is_visible(tag)`

Return whether or not the given *tag* contains visible text.

`mwparserfromhell.definitions.is_single(tag)`

Return whether or not the given *tag* can exist without a close tag.

`mwparserfromhell.definitions.is_single_only(tag)`

Return whether or not the given *tag* must exist without a close tag.

`mwparserfromhell.definitions.is_scheme(scheme, slashes=True)`

Return whether *scheme* is valid for external links.

## string\_mixin Module

This module contains the *StringMixin* type, which implements the interface for the `str` type in a dynamic manner.

**class** `mwparserfromhell.string_mixin.StringMixin`

Implement the interface for `str` in a dynamic manner.

To use this class, inherit from it and override the `__str__()` method to return the string representation of the object. The various string methods will operate on the value of `__str__()` instead of the immutable `self` like the regular `str` type.

**maketrans** ()

Return a translation table usable for `str.translate()`.

If there is only one argument, it must be a dictionary mapping Unicode ordinals (integers) or characters to Unicode ordinals, strings or None. Character keys will be then converted to ordinals. If there are two arguments, they must be strings of equal length, and in the resulting dictionary, each character in *x* will be mapped to the character at the same position in *y*. If there is a third argument, it must be a string, whose characters will be mapped to None in the result.

## utils Module

This module contains accessory functions for other parts of the library. Parser users generally won't need stuff from here.

`mwparserfromhell.utils.parse_anything(value, context=0, skip_style_tags=False)`

Return a *Wikicode* for *value*, allowing multiple types.

This differs from `Parser.parse()` in that we accept more than just a string to be parsed. Strings, bytes, integers (converted to strings), None, existing *Node* or *Wikicode* objects, as well as an iterable of these types, are supported. This is used to parse input on-the-fly by various methods of *Wikicode* and others like *Template*, such as `wikicode.insert()` or setting `template.name`.

Additional arguments are passed directly to `Parser.parse()`.

## wikicode Module

**class** mwparserfromhell.wikicode.**Wikicode** (*nodes*)  
 Bases: *mwparserfromhell.string\_mixin.StringMixin*

A Wikicode is a container for nodes that operates like a string.

Additionally, it contains methods that can be used to extract data from or modify the nodes, implemented in an interface similar to a list. For example, *index()* can get the index of a node in the list, and *insert()* can add a new node at that index. The *filter()* series of functions is very useful for extracting and iterating over, for example, all of the templates in the object.

**RECURSE\_OTHERS = 2**

**append** (*value*)

Insert *value* at the end of the list of nodes.

*value* can be anything parsable by *parse\_anything()*.

**contains** (*obj*)

Return whether this Wikicode object contains *obj*.

If *obj* is a *Node* or *Wikicode* object, then we search for it exactly among all of our children, recursively. Otherwise, this method just uses *\_\_contains\_\_()* on the string.

**filter** (*\*args, \*\*kwargs*)

Return a list of nodes within our list matching certain conditions.

This is equivalent to calling *list()* on *ifilter()*.

**filter\_arguments** (*\*a, \*\*kw*)

Iterate over arguments.

This is equivalent to *filter()* with *forcetype* set to *Argument*.

**filter\_comments** (*\*a, \*\*kw*)

Iterate over comments.

This is equivalent to *filter()* with *forcetype* set to *Comment*.

**filter\_external\_links** (*\*a, \*\*kw*)

Iterate over external\_links.

This is equivalent to *filter()* with *forcetype* set to *ExternalLink*.

**filter\_headings** (*\*a, \*\*kw*)

Iterate over headings.

This is equivalent to *filter()* with *forcetype* set to *Heading*.

**filter\_html\_entities** (*\*a, \*\*kw*)

Iterate over html\_entities.

This is equivalent to *filter()* with *forcetype* set to *HTMLEntity*.

**filter\_tags** (*\*a, \*\*kw*)

Iterate over tags.

This is equivalent to *filter()* with *forcetype* set to *Tag*.

**filter\_templates** (*\*a, \*\*kw*)

Iterate over templates.

This is equivalent to *filter()* with *forcetype* set to *Template*.

**filter\_text** (\*a, \*\*kw)

Iterate over text.

This is equivalent to `filter()` with `forcetype` set to `Text`.

**filter\_wikilinks** (\*a, \*\*kw)

Iterate over wikilinks.

This is equivalent to `filter()` with `forcetype` set to `Wikilink`.

**get** (index)

Return the *index*th node within the list of nodes.

**get\_ancestors** (obj)

Return a list of all ancestor nodes of the *Node* obj.

The list is ordered from the most shallow ancestor (greatest great- grandparent) to the direct parent. The node itself is not included in the list. For example:

```
>>> text = "{{a|{{b|{{c|{{d}}}}}}}}}"
>>> code = mwparserfromhell.parse(text)
>>> node = code.filter_templates(matches=lambda n: n == "{{d}}")[0]
>>> code.get_ancestors(node)
['{{a|{{b|{{c|{{d}}}}}}}', '{{b|{{c|{{d}}}}}', '{{c|{{d}}}}']
```

Will return an empty list if *obj* is at the top level of this Wikicode object. Will raise `ValueError` if it wasn't found.

**get\_parent** (obj)

Return the direct parent node of the *Node* obj.

This function is equivalent to calling `get_ancestors()` and taking the last element of the resulting list. Will return `None` if the node exists but does not have a parent; i.e., it is at the top level of the Wikicode object.

**get\_sections** (levels=None, matches=None, flags=<RegexFlag.UNICODE|DOTALL|IGNORECASE: 50>, flat=False, include\_lead=None, include\_headings=True)

Return a list of sections within the page.

Sections are returned as *Wikicode* objects with a shared node list (implemented using *SmartList*) so that changes to sections are reflected in the parent Wikicode object.

Each section contains all of its subsections, unless *flat* is `True`. If *levels* is given, it should be a iterable of integers; only sections whose heading levels are within it will be returned. If *matches* is given, it should be either a function or a regex; only sections whose headings match it (without the surrounding equal signs) will be included. *flags* can be used to override the default regex flags (see `ifilter()`) if a regex *matches* is used.

If *include\_lead* is `True`, the first, lead section (without a heading) will be included in the list; `False` will not include it; the default will include it only if no specific *levels* were given. If *include\_headings* is `True`, the section's beginning *Heading* object will be included; otherwise, this is skipped.

**get\_tree** ()

Return a hierarchical tree representation of the object.

The representation is a string makes the most sense printed. It is built by calling `_get_tree()` on the *Wikicode* object and its children recursively. The end result may look something like the following:

```
>>> text = "Lorem ipsum {{foo|bar|{{baz}}|spam=eggs}}"
>>> print(mwparserfromhell.parse(text).get_tree())
Lorem ipsum
```

(continues on next page)

(continued from previous page)

```

{{
    foo
    | 1
    = bar
    | 2
    = {{
        baz
    }}
    | spam
    = eggs
}}
```

**ifilter** (*recursive=True*, *matches=None*, *flags=<RegexFlag.UNICODE|DOTALL|IGNORECASE:50>*, *forcetype=None*)

Iterate over nodes in our list matching certain conditions.

If *forcetype* is given, only nodes that are instances of this type (or tuple of types) are yielded. Setting *recursive* to *True* will iterate over all children and their descendants. *RECURSE\_OTHERS* will only iterate over children that are not the instances of *forcetype*. *False* will only iterate over immediate children.

*RECURSE\_OTHERS* can be used to iterate over all un-nested templates, even if they are inside of HTML tags, like so:

```

>>> code = mwparserfromhell.parse("<{{foo}}><b>{{foo|{{bar}}}}</b>")
>>> code.filter_templates(code.RECURSE_OTHERS)
["{{foo}}", "{{foo|{{bar}}}}"]
```

*matches* can be used to further restrict the nodes, either as a function (taking a single *Node* and returning a boolean) or a regular expression (matched against the node's string representation with *re.search()*). If *matches* is a regex, the flags passed to *re.search()* are *re.IGNORECASE*, *re.DOTALL*, and *re.UNICODE*, but custom flags can be specified by passing *flags*.

**ifilter\_arguments** (*\*a*, *\*\*kw*)

Iterate over arguments.

This is equivalent to *ifilter()* with *forcetype* set to *Argument*.

**ifilter\_comments** (*\*a*, *\*\*kw*)

Iterate over comments.

This is equivalent to *ifilter()* with *forcetype* set to *Comment*.

**ifilter\_external\_links** (*\*a*, *\*\*kw*)

Iterate over external links.

This is equivalent to *ifilter()* with *forcetype* set to *ExternalLink*.

**ifilter\_headings** (*\*a*, *\*\*kw*)

Iterate over headings.

This is equivalent to *ifilter()* with *forcetype* set to *Heading*.

**ifilter\_html\_entities** (*\*a*, *\*\*kw*)

Iterate over html\_entities.

This is equivalent to *ifilter()* with *forcetype* set to *HTMLEntity*.

**ifilter\_tags** (*\*a*, *\*\*kw*)

Iterate over tags.

This is equivalent to `ifilter()` with *forcetype* set to *Tag*.

**ifilter\_templates** (\*a, \*\*kw)

Iterate over templates.

This is equivalent to `ifilter()` with *forcetype* set to *Template*.

**ifilter\_text** (\*a, \*\*kw)

Iterate over text.

This is equivalent to `ifilter()` with *forcetype* set to *Text*.

**ifilter\_wikilinks** (\*a, \*\*kw)

Iterate over wikilinks.

This is equivalent to `ifilter()` with *forcetype* set to *Wikilink*.

**index** (obj, recursive=False)

Return the index of *obj* in the list of nodes.

Raises `ValueError` if *obj* is not found. If *recursive* is `True`, we will look in all nodes of ours and their descendants, and return the index of our direct descendant node within *our* list of nodes. Otherwise, the lookup is done only on direct descendants.

**insert** (index, value)

Insert *value* at *index* in the list of nodes.

*value* can be anything parsable by `parse_anything()`, which includes strings or other *Wikicode* or *Node* objects.

**insert\_after** (obj, value, recursive=True)

Insert *value* immediately after *obj*.

*obj* can be either a string, a *Node*, or another *Wikicode* object (as created by `get_sections()`, for example). If *obj* is a string, we will operate on all instances of that string within the code, otherwise only on the specific instance given. *value* can be anything parsable by `parse_anything()`. If *recursive* is `True`, we will try to find *obj* within our child nodes even if it is not a direct descendant of this *Wikicode* object. If *obj* is not found, `ValueError` is raised.

**insert\_before** (obj, value, recursive=True)

Insert *value* immediately before *obj*.

*obj* can be either a string, a *Node*, or another *Wikicode* object (as created by `get_sections()`, for example). If *obj* is a string, we will operate on all instances of that string within the code, otherwise only on the specific instance given. *value* can be anything parsable by `parse_anything()`. If *recursive* is `True`, we will try to find *obj* within our child nodes even if it is not a direct descendant of this *Wikicode* object. If *obj* is not found, `ValueError` is raised.

**matches** (other)

Do a loose equivalency test suitable for comparing page names.

*other* can be any string-like object, including *Wikicode*, or an iterable of these. This operation is symmetric; both sides are adjusted. Specifically, whitespace and markup is stripped and the first letter's case is normalized. Typical usage is `if template.name.matches("stub"):` ....

**nodes**

A list of *Node* objects.

This is the internal data actually stored within a *Wikicode* object.

**remove** (obj, recursive=True)

Remove *obj* from the list of nodes.

*obj* can be either a string, a *Node*, or another *Wikicode* object (as created by *get\_sections()*, for example). If *obj* is a string, we will operate on all instances of that string within the code, otherwise only on the specific instance given. If *recursive* is *True*, we will try to find *obj* within our child nodes even if it is not a direct descendant of this *Wikicode* object. If *obj* is not found, *ValueError* is raised.

**replace** (*obj*, *value*, *recursive=True*)

Replace *obj* with *value*.

*obj* can be either a string, a *Node*, or another *Wikicode* object (as created by *get\_sections()*, for example). If *obj* is a string, we will operate on all instances of that string within the code, otherwise only on the specific instance given. *value* can be anything parsable by *parse\_anything()*. If *recursive* is *True*, we will try to find *obj* within our child nodes even if it is not a direct descendant of this *Wikicode* object. If *obj* is not found, *ValueError* is raised.

**set** (*index*, *value*)

Set the Node at *index* to *value*.

Raises *IndexError* if *index* is out of range, or *ValueError* if *value* cannot be coerced into one *Node*. To insert multiple nodes at an index, use *get()* with either *remove()* and *insert()* or *replace()*.

**strip\_code** (*normalize=True*, *collapse=True*, *keep\_template\_params=False*)

Return a rendered string without unprintable code such as templates.

The way a node is stripped is handled by the *\_\_strip\_\_()* method of *Node* objects, which generally return a subset of their nodes or *None*. For example, templates and tags are removed completely, links are stripped to just their display part, headings are stripped to just their title.

If *normalize* is *True*, various things may be done to strip code further, such as converting HTML entities like *&Sigma;*, *&#931;*, and *&#x3a3;* to *Σ*. If *collapse* is *True*, we will try to remove excess whitespace as well (three or more newlines are converted to two, for example). If *keep\_template\_params* is *True*, then template parameters will be preserved in the output (normally, they are removed completely).

## Subpackages

### nodes Package

#### nodes Package

This package contains *Wikicode* “nodes”, which represent a single unit of wikitext, such as a Template, an HTML tag, a Heading, or plain text. The node “tree” is far from flat, as most types can contain additional *Wikicode* types within them - and with that, more nodes. For example, the name of a *Template* is a *Wikicode* object that can contain text or more templates.

**class** *mwparserfromhell.nodes.Node*

Represents the base Node type, demonstrating the methods to override.

*\_\_str\_\_()* must be overridden. It should return a *str* representation of the node. If the node contains *Wikicode* objects inside of it, *\_\_children\_\_()* should be a generator that iterates over them. If the node is printable (shown when the page is rendered), *\_\_strip\_\_()* should return its printable version, stripping out any formatting marks. It does not have to return a string, but something that can be converted to a string with *str()*. Finally, *\_\_showtree\_\_()* can be overridden to build a nice tree representation of the node, if desired, for *get\_tree()*.

## **`_base` Module**

**class** `mwparserfromhell.nodes._base.Node`

Bases: `mwparserfromhell.string_mixin.StringMixin`

Represents the base Node type, demonstrating the methods to override.

`__str__()` must be overridden. It should return a `str` representation of the node. If the node contains `WikiCode` objects inside of it, `__children__()` should be a generator that iterates over them. If the node is printable (shown when the page is rendered), `__strip__()` should return its printable version, stripping out any formatting marks. It does not have to return a string, but something that can be converted to a string with `str()`. Finally, `__showtree__()` can be overridden to build a nice tree representation of the node, if desired, for `get_tree()`.

## **`argument` Module**

**class** `mwparserfromhell.nodes.argument.Argument` (*name*, *default=None*)

Bases: `mwparserfromhell.nodes._base.Node`

Represents a template argument substitution, like `{{{foo}}}`.

**default**

The default value to substitute if none is passed.

This will be `None` if the argument wasn't defined with one. The MediaWiki parser handles this by rendering the argument itself in the result, complete braces. To have the argument render as nothing, set default to `"` (`{{{arg}}}` vs. `{{{arg|}}}`).

**name**

The name of the argument to substitute.

## **`comment` Module**

**class** `mwparserfromhell.nodes.comment.Comment` (*contents*)

Bases: `mwparserfromhell.nodes._base.Node`

Represents a hidden HTML comment, like `<!-- foobar -->`.

**contents**

The hidden text contained between `<!--` and `-->`.

## **`external_link` Module**

**class** `mwparserfromhell.nodes.external_link.ExternalLink` (*url*, *title=None*,  
*brackets=True*, *suppress\_space=False*)

Bases: `mwparserfromhell.nodes._base.Node`

Represents an external link, like `[http://example.com/ Example]`.

**brackets**

Whether to enclose the URL in brackets or display it straight.

**title**

The link title (if given), as a `WikiCode` object.



**url**

The URL of the link target, as a *Wikicode* object.

## heading Module

**class** mwparserfromhell.nodes.heading.**Heading** (*title, level*)

Bases: *mwparserfromhell.nodes.\_base.Node*

Represents a section heading in wikicode, like `== Foo ==`.

**level**

The heading level, as an integer between 1 and 6, inclusive.

**title**

The title of the heading, as a *Wikicode* object.

## html\_entity Module

**class** mwparserfromhell.nodes.html\_entity.**HTMLEntity** (*value, named=None, hexadecimal=False, hex\_char='x'*)

Bases: *mwparserfromhell.nodes.\_base.Node*

Represents an HTML entity, like `&nbsp;`; either named or unnamed.

**hex\_char**

If the value is hexadecimal, this is the letter denoting that.

For example, the `hex_char` of `"&#x1234;"` is `"x"`, whereas the `hex_char` of `"&#X1234;"` is `"X"`. Lowercase and uppercase `x` are the only values supported.

**hexadecimal**

If unnamed, this is whether the value is hexadecimal or decimal.

**named**

Whether the entity is a string name for a codepoint or an integer.

For example, `&Sigma;`, `&#931;`, and `&#x3a3;` refer to the same character, but only the first is “named”, while the others are integer representations of the codepoint.

**normalize()**

Return the unicode character represented by the HTML entity.

**value**

The string value of the HTML entity.

## tag Module

**class** mwparserfromhell.nodes.tag.**Tag** (*tag, contents=None, attrs=None, wiki\_markup=None, self\_closing=False, invalid=False, implicit=False, padding="", closing\_tag=None, wiki\_style\_separator=None, closing\_wiki\_markup=None*)

Bases: *mwparserfromhell.nodes.\_base.Node*

Represents an HTML-style tag in wikicode, like `<ref>`.

**add** (*name*, *value*=None, *quotes*='', *pad\_first*=' ', *pad\_before\_eq*='', *pad\_after\_eq*='')

Add an attribute with the given *name* and *value*.

*name* and *value* can be anything parsable by `utils.parse_anything()`; *value* can be omitted if the attribute is valueless. If *quotes* is not None, it should be a string (either " or ') that *value* will be wrapped in (this is recommended). None is only legal if *value* contains no spacing.

*pad\_first*, *pad\_before\_eq*, and *pad\_after\_eq* are whitespace used as padding before the name, before the equal sign (or after the name if no value), and after the equal sign (ignored if no value), respectively.

#### **attributes**

The list of attributes affecting the tag.

Each attribute is an instance of `Attribute`.

#### **closing\_tag**

The closing tag, as a `Wikicode` object.

This will usually equal *tag*, unless there is additional spacing, comments, or the like.

#### **closing\_wiki\_markup**

The wikified version of the closing tag to show instead of HTML.

If set to a value, this will be displayed instead of the close tag brackets. If tag is `self_closing` is True then this is not displayed. If `wiki_markup` is set and this has not been set, this is set to the value of `wiki_markup`. If this has been set and `wiki_markup` is set to a False value, this is set to None.

#### **contents**

The contents of the tag, as a `Wikicode` object.

#### **get** (*name*)

Get the attribute with the given *name*.

The returned object is a `Attribute` instance. Raises `ValueError` if no attribute has this name. Since multiple attributes can have the same name, we'll return the last match, since all but the last are ignored by the MediaWiki parser.

#### **has** (*name*)

Return whether any attribute in the tag has the given *name*.

Note that a tag may have multiple attributes with the same name, but only the last one is read by the MediaWiki parser.

#### **implicit**

Whether the tag is implicitly self-closing, with no ending slash.

This is only possible for specific “single” tags like `<br>` and `<li>`. See `definitions.is_single()`. This field only has an effect if `self_closing` is also True.

#### **invalid**

Whether the tag starts with a backslash after the opening bracket.

This makes the tag look like a lone close tag. It is technically invalid and is only parsable Wikicode when the tag itself is single-only, like `<br>` and `<img>`. See `definitions.is_single_only()`.

#### **padding**

Spacing to insert before the first closing `>`.

#### **remove** (*name*)

Remove all attributes with the given *name*.

Raises `ValueError` if none were found.

**self\_closing**

Whether the tag is self-closing with no content (like `<br/>`).

**tag**

The tag itself, as a *Wikicode* object.

**wiki\_markup**

The wikified version of a tag to show instead of HTML.

If set to a value, this will be displayed instead of the brackets. For example, set to `' '` to replace `<i>` or `----` to replace `<hr>`.

**wiki\_style\_separator**

The separator between the padding and content in a wiki markup tag.

Essentially the wiki equivalent of the `TagCloseOpen`.

**template Module**

**class** `mwparserfromhell.nodes.template.Template` (*name*, *params=None*)

Bases: `mwparserfromhell.nodes._base.Node`

Represents a template in wikicode, like `{{foo}}`.

**add** (*name*, *value*, *showkey=None*, *before=None*, *preserve\_spacing=True*)

Add a parameter to the template with a given *name* and *value*.

*name* and *value* can be anything parsable by `utils.parse_anything()`; pipes and equal signs are automatically escaped from *value* when appropriate.

If *name* is already a parameter in the template, we'll replace its value.

If *showkey* is given, this will determine whether or not to show the parameter's name (e.g., `{{foo|bar}}`'s parameter has a name of `"1"` but it is hidden); otherwise, we'll make a safe and intelligent guess.

If *before* is given (either a *Parameter* object or a name), then we will place the parameter immediately before this one. Otherwise, it will be added at the end. If *before* is a name and exists multiple times in the template, we will place it before the last occurrence. If *before* is not in the template, `ValueError` is raised. The argument is ignored if *name* is an existing parameter.

If *preserve\_spacing* is `True`, we will try to preserve whitespace conventions around the parameter, whether it is new or we are updating an existing value. It is disabled for parameters with hidden keys, since MediaWiki doesn't strip whitespace in this case.

**get** (*name*, *default=<object object>*)

Get the parameter whose name is *name*.

The returned object is a *Parameter* instance. Raises `ValueError` if no parameter has this name. If *default* is set, returns that instead. Since multiple parameters can have the same name, we'll return the last match, since the last parameter is the only one read by the MediaWiki parser.

**has** (*name*, *ignore\_empty=False*)

Return `True` if any parameter in the template is named *name*.

With *ignore\_empty*, `False` will be returned even if the template contains a parameter with the name *name*, if the parameter's value is empty. Note that a template may have multiple parameters with the same name, but only the last one is read by the MediaWiki parser.

**has\_param** (*name*, *ignore\_empty=False*)

Alias for `has()`.

**name**

The name of the template, as a *WikiCode* object.

**params**

The list of parameters contained within the template.

**remove** (*param*, *keep\_field=False*)

Remove a parameter from the template, identified by *param*.

If *param* is a *Parameter* object, it will be matched exactly, otherwise it will be treated like the *name* argument to *has()* and *get()*.

If *keep\_field* is *True*, we will keep the parameter's name, but blank its value. Otherwise, we will remove the parameter completely.

When removing a parameter with a hidden name, subsequent parameters with hidden names will be made visible. For example, removing *bar* from `{{foo|bar|baz}}` produces `{{foo|2=baz}}` because `{{foo|baz}}` is incorrect.

If the parameter shows up multiple times in the template and *param* is not a *Parameter* object, we will remove all instances of it (and keep only one if *keep\_field* is *True* - either the one with a hidden name, if it exists, or the first instance).

**text Module**

```
class mwparserfromhell.nodes.text.Text (value)
```

Bases: *mwparserfromhell.nodes.\_base.Node*

Represents ordinary, unformatted text with no special properties.

**value**

The actual text itself.

**wikilink Module**

```
class mwparserfromhell.nodes.wikilink.Wikilink (title, text=None)
```

Bases: *mwparserfromhell.nodes.\_base.Node*

Represents an internal wikilink, like `[[Foo|Bar]]`.

**text**

The text to display (if any), as a *WikiCode* object.

**title**

The title of the linked page, as a *WikiCode* object.

**Subpackages****extras Package****extras Package**

This package contains objects used by *Nodes*, but that are not nodes themselves. This includes template parameters and HTML tag attributes.

## attribute Module

```
class mwparserfromhell.nodes.extras.attribute.Attribute(name,          value=None,
                                                         quotes='"',   pad_first='
',          pad_before_eq=",
pad_after_eq="")
```

Bases: *mwparserfromhell.string\_mixin.StringMixin*

Represents an attribute of an HTML tag.

This is used by *Tag* objects. For example, the tag `<ref name="foo">` contains an *Attribute* whose name is "name" and whose value is "foo".

**static coerce\_quotes** (*quotes*)

Coerce a quote type into an acceptable value, or raise an error.

**name**

The name of the attribute as a *Wikicode* object.

**pad\_after\_eq**

Spacing to insert right after the equal sign.

**pad\_before\_eq**

Spacing to insert right before the equal sign.

**pad\_first**

Spacing to insert right before the attribute.

**quotes**

How to enclose the attribute value. ", ', or None.

**value**

The value of the attribute as a *Wikicode* object.

## parameter Module

```
class mwparserfromhell.nodes.extras.parameter.Parameter(name,          value,
                                                         showkey=True)
```

Bases: *mwparserfromhell.string\_mixin.StringMixin*

Represents a parameter of a template.

For example, the template `{{foo|bar|spam=eggs}}` contains two *Parameters*: one whose name is "1", value is "bar", and showkey is False, and one whose name is "spam", value is "eggs", and showkey is True.

**static can\_hide\_key** (*key*)

Return whether or not the given key can be hidden.

**name**

The name of the parameter as a *Wikicode* object.

**showkey**

Whether to show the parameter's key (i.e., its "name").

**value**

The value of the parameter as a *Wikicode* object.

## parser Package

### parser Package

This package contains the actual wikicode parser, split up into two main modules: the *tokenizer* and the *builder*. This module joins them together into one interface.

**class** mwparserfromhell.parser.Parser

Represents a parser for wikicode.

Actual parsing is a two-step process: first, the text is split up into a series of tokens by the *Tokenizer*, and then the tokens are converted into trees of *Wikicode* objects and *Nodes* by the *Builder*.

Instances of this class or its dependents (*Tokenizer* and *Builder*) should not be shared between threads. *parse()* can be called multiple times as long as it is not done concurrently. In general, there is no need to do this because parsing should be done through *mwparserfromhell.parse()*, which creates a new *Parser* object as necessary.

**parse** (*text*, *context*=0, *skip\_style\_tags*=False)

Parse *text*, returning a *Wikicode* object tree.

If given, *context* will be passed as a starting context to the parser. This is helpful when this function is used inside node attribute setters. For example, *ExternalLink*'s *url* setter sets *context* to *contexts.EXT\_LINK\_URI* to prevent the URL itself from becoming an *ExternalLink*.

If *skip\_style\_tags* is True, then *'* and *' '* will not be parsed, but instead will be treated as plain text.

If there is an internal error while parsing, *ParserError* will be raised.

**exception** mwparserfromhell.parser.ParserError (*extra*)

Exception raised when an internal error occurs while parsing.

This does not mean that the wikicode was invalid, because invalid markup should still be parsed correctly. This means that the parser caught itself with an impossible internal state and is bailing out before other problems can happen. Its appearance indicates a bug.

## builder Module

**class** mwparserfromhell.parser.builder.Builder

Builds a tree of nodes out of a sequence of tokens.

To use, pass a list of *Tokens* to the *build()* method. The list will be exhausted as it is parsed and a *Wikicode* object containing the node tree will be returned.

**\_handle\_argument** (*token*)

Handle a case where an argument is at the head of the tokens.

**\_handle\_attribute** (*start*)

Handle a case where a tag attribute is at the head of the tokens.

**\_handle\_comment** (*token*)

Handle a case where an HTML comment is at the head of the tokens.

**\_handle\_entity** (*token*)

Handle a case where an HTML entity is at the head of the tokens.

**\_handle\_external\_link** (*token*)

Handle when an external link is at the head of the tokens.

**`_handle_heading`** (*token*)  
Handle a case where a heading is at the head of the tokens.

**`_handle_parameter`** (*default*)  
Handle a case where a parameter is at the head of the tokens.  
*default* is the value to use if no parameter name is defined.

**`_handle_tag`** (*token*)  
Handle a case where a tag is at the head of the tokens.

**`_handle_template`** (*token*)  
Handle a case where a template is at the head of the tokens.

**`_handle_token`** (*token*)  
Handle a single token.

**`_handle_wikilink`** (*token*)  
Handle a case where a wikilink is at the head of the tokens.

**`_pop`** ()  
Pop the current node list off of the stack.  
  
The raw node list is wrapped in a *SmartList* and then in a *Wikicode* object.

**`_push`** ()  
Push a new node list onto the stack.

**`_write`** (*item*)  
Append a node to the current node list.

**`build`** (*tokenlist*)  
Build a Wikicode object from a list tokens and return it.

## contexts Module

This module contains various “context” definitions, which are essentially flags set during the tokenization process, either on the current parse stack (local contexts) or affecting all stacks (global contexts). They represent the context the tokenizer is in, such as inside a template’s name definition, or inside a level-two heading. This is used to determine what tokens are valid at the current point and also if the current parsing route is invalid.

The tokenizer stores context as an integer, with these definitions bitwise OR’d to set them, AND’d to check if they’re set, and XOR’d to unset them. The advantage of this is that contexts can have sub-contexts (as `FOO == 0b11` will cover `BAR == 0b10` and `BAZ == 0b01`).

Local (stack-specific) contexts:

- `TEMPLATE`
  - `TEMPLATE_NAME`
  - `TEMPLATE_PARAM_KEY`
  - `TEMPLATE_PARAM_VALUE`
- `ARGUMENT`
  - `ARGUMENT_NAME`
  - `ARGUMENT_DEFAULT`
- `WIKILINK`
  - `WIKILINK_TITLE`

- WIKILINK\_TEXT
- EXT\_LINK
  - EXT\_LINK\_URI
  - EXT\_LINK\_TITLE
- HEADING
  - HEADING\_LEVEL\_1
  - HEADING\_LEVEL\_2
  - HEADING\_LEVEL\_3
  - HEADING\_LEVEL\_4
  - HEADING\_LEVEL\_5
  - HEADING\_LEVEL\_6
- TAG
  - TAG\_OPEN
  - TAG\_ATTR
  - TAG\_BODY
  - TAG\_CLOSE
- STYLE
  - STYLE\_ITALICS
  - STYLE\_BOLD
  - STYLE\_PASS\_AGAIN
  - STYLE\_SECOND\_PASS
- DL\_TERM
- SAFETY\_CHECK
  - HAS\_TEXT
  - FAIL\_ON\_TEXT
  - FAIL\_NEXT
  - FAIL\_ON\_LBRACE
  - FAIL\_ON\_RBRACE
  - FAIL\_ON\_EQUALS
  - HAS\_TEMPLATE
- TABLE
  - TABLE\_OPEN
  - TABLE\_CELL\_OPEN
  - TABLE\_CELL\_STYLE
  - TABLE\_TD\_LINE
  - TABLE\_TH\_LINE



- TABLE\_CELL\_LINE\_CONTEXTS

- HTML\_ENTITY

Global contexts:

- GL\_HEADING

Aggregate contexts:

- FAIL
- UNSAFE
- DOUBLE
- NO\_WIKILINKS
- NO\_EXT\_LINKS

`mwparserfromhell.parser.contexts.describe(context)`

Return a string describing the given context value, for debugging.

## errors Module

**exception** `mwparserfromhell.parser.errors.ParserError(extra)`

Exception raised when an internal error occurs while parsing.

This does not mean that the wikicode was invalid, because invalid markup should still be parsed correctly. This means that the parser caught itself with an impossible internal state and is bailing out before other problems can happen. Its appearance indicates a bug.

## tokenizer Module

**class** `mwparserfromhell.parser.tokenizer.Tokenizer`

Creates a list of tokens from a string of wikicode.

**END** = <object object>

**MARKERS** = ['{', '}', '[', ']', '<', '>', '|', '=', '&', '"', '#', '\*', ';', ':', '/',

**MAX\_DEPTH** = 40

**START** = <object object>

**USES\_C** = False

**\_can\_recurse()**

Return whether or not our max recursion depth has been exceeded.

**\_context**

The current token context.

**\_emit(token)**

Write a token to the end of the current token stack.

**\_emit\_all(tokenlist)**

Write a series of tokens to the current stack at once.

**\_emit\_first(token)**

Write a token to the beginning of the current token stack.

**`_emit_style_tag`** (*tag*, *markup*, *body*)

Write the body of a tag and the tokens that should surround it.

**`_emit_table_tag`** (*open\_open\_markup*, *tag*, *style*, *padding*, *close\_open\_markup*, *contents*,  
*open\_close\_markup*)

Emit a table tag.

**`_emit_text`** (*text*)

Write text to the current textbuffer.

**`_emit_text_then_stack`** (*text*)

Pop the current stack, write *text*, and then write the stack.

**`_fail_route`** ()

Fail the current tokenization route.

Discards the current stack/context/textbuffer and raises *BadRoute*.

**`_handle_argument_end`** ()

Handle the end of an argument at the head of the string.

**`_handle_argument_separator`** ()

Handle the separator between an argument's name and default.

**`_handle_blacklisted_tag`** ()

Handle the body of an HTML tag that is parser-blacklisted.

**`_handle_dl_term`** ()

Handle the term in a description list (*foo* in ; *foo*:*bar*).

**`_handle_end`** ()

Handle the end of the stream of wikitext.

**`_handle_free_link_text`** (*punct*, *tail*, *this*)

Handle text in a free ext link, including trailing punctuation.

**`_handle_heading_end`** ()

Handle the end of a section heading at the head of the string.

**`_handle_hr`** ()

Handle a wiki-style horizontal rule (----) in the string.

**`_handle_invalid_tag_start`** ()

Handle the (possible) start of an implicitly closing single tag.

**`_handle_list`** ()

Handle a wiki-style list (#, \*, ;, :).

**`_handle_list_marker`** ()

Handle a list marker at the head (#, \*, ;, :).

**`_handle_single_only_tag_end`** ()

Handle the end of an implicitly closing single-only HTML tag.

**`_handle_single_tag_end`** ()

Handle the stream end when inside a single-supporting HTML tag.

**`_handle_table_cell`** (*markup*, *tag*, *line\_context*)

Parse as normal syntax unless we hit a style marker, then parse style as HTML attributes and the remainder as normal syntax.

**`_handle_table_cell_end`** (*reset\_for\_style=False*)

Returns the current context, with the TABLE\_CELL\_STYLE flag set if it is necessary to reset and parse style attributes.

**`_handle_table_end()`**  
Return the stack in order to handle the table end.

**`_handle_table_row()`**  
Parse as style until end of the line, then continue.

**`_handle_table_row_end()`**  
Return the stack in order to handle the table row end.

**`_handle_table_style(end_token)`**  
Handle style attributes for a table until *end\_token*.

**`_handle_tag_close_close()`**  
Handle the ending of a closing tag (`</foo>`).

**`_handle_tag_close_open(data, token)`**  
Handle the closing of a open tag (`<foo>`).

**`_handle_tag_data(data, text)`**  
Handle all sorts of *text* data inside of an HTML open tag.

**`_handle_tag_open_close()`**  
Handle the opening of a closing tag (`</foo>`).

**`_handle_tag_space(data, text)`**  
Handle whitespace (*text*) inside of an HTML open tag.

**`_handle_tag_text(text)`**  
Handle regular *text* inside of an HTML open tag.

**`_handle_template_end()`**  
Handle the end of a template at the head of the string.

**`_handle_template_param()`**  
Handle a template parameter at the head of the string.

**`_handle_template_param_value()`**  
Handle a template parameter's value at the head of the string.

**`_handle_wikilink_end()`**  
Handle the end of a wikilink at the head of the string.

**`_handle_wikilink_separator()`**  
Handle the separator between a wikilink's title and its text.

**`_is_free_link_end(this, nxt)`**  
Return whether the current head is the end of a free link.

**`_memoize_bad_route()`**  
Remember that the current route (head + context at push) is invalid.  
  
This will be noticed when calling `_push` with the same head and context, and the route will be failed immediately.

**`_parse(context=0, push=True)`**  
Parse the wikicode string, using *context* for when to stop.

**`_parse_argument()`**  
Parse an argument at the head of the wikicode string.

**`_parse_bold()`**  
Parse wiki-style bold.

**`_parse_bracketed_uri_scheme()`**  
Parse the URI scheme of a bracket-enclosed external link.

**`_parse_comment()`**  
Parse an HTML comment at the head of the wikicode string.

**`_parse_entity()`**  
Parse an HTML entity at the head of the wikicode string.

**`_parse_external_link(brackets)`**  
Parse an external link at the head of the wikicode string.

**`_parse_free_uri_scheme()`**  
Parse the URI scheme of a free (no brackets) external link.

**`_parse_heading()`**  
Parse a section heading at the head of the wikicode string.

**`_parse_italics()`**  
Parse wiki-style italics.

**`_parse_italics_and_bold()`**  
Parse wiki-style italics and bold together (i.e., five ticks).

**`_parse_style()`**  
Parse wiki-style formatting ( `'/'` for italics/bold).

**`_parse_table()`**  
Parse a wikicode table by starting with the first line.

**`_parse_tag()`**  
Parse an HTML tag at the head of the wikicode string.

**`_parse_template(has_content)`**  
Parse a template at the head of the wikicode string.

**`_parse_template_or_argument()`**  
Parse a template or argument at the head of the wikicode string.

**`_parse_wikilink()`**  
Parse an internal wikilink at the head of the wikicode string.

**`_pop(keep_context=False)`**  
Pop the current stack/context/textbuffer, returning the stack.  
  
If `keep_context` is `True`, then we will replace the underlying stack's context with the current stack's.

**`_push(context=0)`**  
Add a new token stack, context, and textbuffer to the list.

**`_push_tag_buffer(data)`**  
Write a pending tag attribute from *data* to the stack.

**`_push_textbuffer()`**  
Push the textbuffer onto the stack as a Text node and clear it.

**`_read(delta=0, wrap=False, strict=False)`**  
Read the value at a relative point in the wikicode.  
  
The value is read from `self._head` plus the value of *delta* (which can be negative). If *wrap* is `False`, we will not allow attempts to read from the end of the string if `self._head + delta` is negative. If *strict* is `True`, the route will be failed (with `_fail_route()`) if we try to read from past the end of the string; otherwise, `self.END` is returned. If we try to read from before the start of the string, `self.START` is returned.

**`_really_parse_entity()`**  
 Actually parse an HTML entity and ensure that it is valid.

**`_really_parse_external_link(brackets)`**  
 Really parse an external link.

**`_really_parse_tag()`**  
 Actually parse an HTML tag, starting with the open (`<foo>`).

**`_remove_uri_scheme_from_textbuffer(scheme)`**  
 Remove the URI scheme of a new external link from the textbuffer.

**`_stack`**  
 The current token stack.

**`_stack_ident`**  
 An identifier for the current stack.

This is based on the starting head position and context. Stacks with the same identifier are always parsed in the same way. This can be used to cache intermediate parsing info.

**`_textbuffer`**  
 The current textbuffer.

**`_verify_safe(this)`**  
 Make sure we are not trying to write an invalid character.

**`regex = re.compile('([{}\\[\\]<>|=&\'#*;:/\\\\\\\\\\"\\-!\\n])', re.IGNORECASE)`**

**`tag_splitter = re.compile('([\\s\\"\\'\\\\\\\\]+)')`**

**`tokenize(text, context=0, skip_style_tags=False)`**  
 Build a list of tokens from a string of wikicode and return it.

**`exception mwparserfromhell.parser.tokenizer.BadRoute(context=0)`**  
 Raised internally when the current tokenization route is invalid.

## tokens Module

This module contains the token definitions that are used as an intermediate parsing data type - they are stored in a flat list, with each token being identified by its type and optional attributes. The token list is generated in a syntactically valid form by the *Tokenizer*, and then converted into the `:class:Wikicode` tree by the *Builder*.

```
class mwparserfromhell.parser.tokens.Token
    A token stores the semantic meaning of a unit of wikicode.

class mwparserfromhell.parser.tokens.Text

class mwparserfromhell.parser.tokens.TemplateOpen

class mwparserfromhell.parser.tokens.TemplateParamSeparator

class mwparserfromhell.parser.tokens.TemplateParamEquals

class mwparserfromhell.parser.tokens.TemplateClose

class mwparserfromhell.parser.tokens.ArgumentOpen

class mwparserfromhell.parser.tokens.ArgumentSeparator

class mwparserfromhell.parser.tokens.ArgumentClose

class mwparserfromhell.parser.tokens.WikilinkOpen
```

```
class mwparserfromhell.parser.tokens.WikilinkSeparator
class mwparserfromhell.parser.tokens.WikilinkClose
class mwparserfromhell.parser.tokens.ExternalLinkOpen
class mwparserfromhell.parser.tokens.ExternalLinkSeparator
class mwparserfromhell.parser.tokens.ExternalLinkClose
class mwparserfromhell.parser.tokens.HTMLEntityStart
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class mwparserfromhell.parser.tokens.TagOpenOpen
class mwparserfromhell.parser.tokens.TagAttrStart
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class mwparserfromhell.parser.tokens.TagAttrQuote
class mwparserfromhell.parser.tokens.TagCloseOpen
class mwparserfromhell.parser.tokens.TagCloseSelfclose
class mwparserfromhell.parser.tokens.TagOpenClose
class mwparserfromhell.parser.tokens.TagCloseClose
```

## smart\_list Package

### smart\_list Package

This module contains the *SmartList* type, as well as its *ListProxy* child, which together implement a list whose sublists reflect changes made to the main list, and vice-versa.

### list\_proxy Module

```
class mwparserfromhell.smart_list.list_proxy.ListProxy (parent, sliceinfo)
    Implement the list interface by getting elements from a parent.
```

This is created by a *SmartList* object when slicing. It does not actually store the list at any time; instead, whenever the list is needed, it builds it dynamically using the `_render()` method.

```
append (item)
    Append object to the end of the list.
```

```
count (item)
    Return number of occurrences of value.
```

**extend** (*item*)  
 Extend list by appending elements from the iterable.

**index** (*item*, *start=None*, *stop=None*)  
 Return first index of value.  
 Raises `ValueError` if the value is not present.

**insert** (*index*, *item*)  
 Insert object before index.

**pop** (*index=None*)  
 Remove and return item at index (default last).  
 Raises `IndexError` if list is empty or index is out of range.

**remove** (*item*)  
 Remove first occurrence of value.  
 Raises `ValueError` if the value is not present.

**reverse** ()  
 Reverse *IN PLACE*.

**sort** (*key=None*, *reverse=None*)  
 Stable sort *IN PLACE*.

## smart\_list Module

**class** `mwparserfromhell.smart_list.smart_list.SmartList` (*iterable=None*)  
 Implements the `list` interface with special handling of sublists.

When a sublist is created (by `list[i:j]`), any changes made to this list (such as the addition, removal, or replacement of elements) will be reflected in the sublist, or vice-versa, to the greatest degree possible. This is implemented by having sublists - instances of the `ListProxy` type - dynamically determine their elements by storing their slice info and retrieving that slice from the parent. Methods that change the size of the list also change the slice info. For example:

```
>>> parent = SmartList([0, 1, 2, 3])
>>> parent
[0, 1, 2, 3]
>>> child = parent[2:]
>>> child
[2, 3]
>>> child.append(4)
>>> child
[2, 3, 4]
>>> parent
[0, 1, 2, 3, 4]
```

**append** (*item*)  
 Append object to the end of the list.

**extend** (*item*)  
 Extend list by appending elements from the iterable.

**insert** (*index*, *item*)  
 Insert object before index.

**pop** (*index=None*)

Remove and return item at index (default last).

Raises `IndexError` if list is empty or index is out of range.

**remove** (*item*)

Remove first occurrence of value.

Raises `ValueError` if the value is not present.

**reverse** ()

Reverse *IN PLACE*.

**sort** (*key=None, reverse=None*)

Stable sort *IN PLACE*.

## **utils Module**



## CHAPTER 3

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