
Dictdiffer Documentation

Release 0.7.2.dev20180504

Fatih Erikli

May 10, 2018

Contents

1	Installation	3
2	Usage	5
3	API	7
4	Changes	11
5	Contributing	13
6	License	15
7	Authors	17
	Python Module Index	19

Dictdiffer is a helper module that helps you to diff and patch dictionaries.

CHAPTER 1

Installation

Dictdiffer is on PyPI so all you need is:

```
$ pip install dictdiffer
```


Let's start with an example on how to find the diff between two dictionaries using `diff()` method:

```
from dictdiffer import diff, patch, swap, revert

first = {
    "title": "hello",
    "fork_count": 20,
    "stargazers": ["/users/20", "/users/30"],
    "settings": {
        "assignees": [100, 101, 201],
    }
}

second = {
    "title": "hellooo",
    "fork_count": 20,
    "stargazers": ["/users/20", "/users/30", "/users/40"],
    "settings": {
        "assignees": [100, 101, 202],
    }
}

result = diff(first, second)

assert list(result) == [
    ('change', ['settings', 'assignees', 2], (201, 202)),
    ('add', 'stargazers', [(2, '/users/40')]),
    ('change', 'title', ('hello', 'hellooo'))]
```

Now we can apply the diff result with `patch()` method:

```
result = diff(first, second)
patched = patch(result, first)

assert patched == second
```

Also we can swap the diff result with `swap()` method:

```
result = diff(first, second)
swapped = swap(result)

assert list(swapped) == [
    ('change', ['settings', 'assignees', 2], (202, 201)),
    ('remove', 'stargazers', [(2, '/users/40')]),
    ('change', 'title', ('hellooo', 'hello'))]
```

Let's revert the last changes:

```
result = diff(first, second)
reverted = revert(result, patched)
assert reverted == first
```

A tolerance can be used to consider closed values as equal. The tolerance parameter only applies for int and float.

Let's try with a tolerance of 10% with the values 10 and 10.5:

```
first = {'a': 10.0}
second = {'a': 10.5}

result = diff(first, second, tolerance=0.1)

assert list(result) == []
```

Now with a tolerance of 1%:

```
result = diff(first, second, tolerance=0.01)

assert list(result) == ('change', 'a', (10.0, 10.5))
```

Dictdiffer is a helper module to diff and patch dictionaries.

`dictdiffer.diff` (*first*, *second*, *node=None*, *ignore=None*, *path_limit=None*, *expand=False*, *tolerance=2.220446049250313e-16*)
Compare two dictionary/list/set objects, and returns a diff result.

Return an iterator with differences between two objects. The diff items represent addition/deletion/change and the item value is a *deep copy* from the corresponding source or destination objects.

```
>>> from dictdiffer import diff
>>> result = diff({'a': 'b'}, {'a': 'c'})
>>> list(result)
[('change', 'a', ('b', 'c'))]
```

The keys can be skipped from difference calculation when they are included in `ignore` argument of type `collections.Container`.

```
>>> list(diff({'a': 1, 'b': 2}, {'a': 3, 'b': 4}, ignore=set(['a'])))
[('change', 'b', (2, 4))]
>>> class IgnoreCase(set):
...     def __contains__(self, key):
...         return set.__contains__(self, str(key).lower())
>>> list(diff({'a': 1, 'b': 2}, {'A': 3, 'b': 4}, ignore=IgnoreCase('a')))
[('change', 'b', (2, 4))]
```

The difference calculation can be limited to certain path:

```
>>> list(diff({}, {'a': {'b': 'c'}}))
[('add', '', [('a', {'b': 'c'})])]
```

```
>>> from dictdiffer.utils import PathLimit
>>> list(diff({}, {'a': {'b': 'c'}}, path_limit=PathLimit()))
[('add', '', [('a', {})]), ('add', 'a', [('b', 'c')])]
```

```
>>> from dictdiffer.utils import PathLimit
>>> list(diff({}, {'a': {'b': 'c'}}, path_limit=PathLimit([('a',)]))
[('add', '', [({'a', {'b': 'c'}})])]
```

```
>>> from dictdiffer.utils import PathLimit
>>> list(diff({}, {'a': {'b': 'c'}},
...         path_limit=PathLimit([('a', 'b')]))
[('add', '', [({'a', {})}]), ('add', 'a', [({'b', 'c'})])]
```

The patch can be expanded to small units e.g. when adding multiple values:

```
>>> list(diff({'fruits': []}, {'fruits': ['apple', 'mango']}))
[('add', 'fruits', [(0, 'apple'), (1, 'mango')])]
```

```
>>> list(diff({'fruits': []}, {'fruits': ['apple', 'mango']}, expand=True))
[('add', 'fruits', [(0, 'apple')]), ('add', 'fruits', [(1, 'mango')])]
```

Parameters

- **first** – The original dictionary, list or set.
- **second** – New dictionary, list or set.
- **node** – Key for comparison that can be used in `dot_lookup()`.
- **ignore** – Set of keys that should not be checked.
- **path_limit** – List of path limit tuples or `dictdiffer.utils.Pathlimit` object to limit the diff recursion depth.
- **expand** – Expand the patches.
- **tolerance** – Threshold to consider when comparing two float numbers.

Changed in version 0.3: Added `ignore` parameter.

Changed in version 0.4: Arguments `first` and `second` can now contain a set.

Changed in version 0.5: Added `path_limit` parameter. Added `expand` paramter. Added `tolerance` parameter.

Changed in version 0.7: Diff items are deep copies from its corresponding objects. Argument `ignore` is always converted to a set.

`dictdiffer.patch(diff_result, destination, in_place=False)`
Patch the diff result to the destination dictionary.

Parameters

- **diff_result** – Changes returned by `diff`.
- **destination** – Structure to apply the changes to.
- **in_place** – By default, destination dictionary is deep copied before applying the patch, and the copy is returned. Setting `in_place=True` means that patch will apply the changes directly to and return the destination structure.

`dictdiffer.swap(diff_result)`
Swap the diff result.

It uses following mapping:

- remove -> add

- add -> remove

In addition, swap the changed values for *change* flag.

```
>>> from dictdiffer import swap
>>> swapped = swap([('add', 'a.b.c', [('a', 'b'), ('c', 'd')])])
>>> next(swapped)
('remove', 'a.b.c', [('c', 'd'), ('a', 'b')])
```

```
>>> swapped = swap([('change', 'a.b.c', ('a', 'b')])])
>>> next(swapped)
('change', 'a.b.c', ('b', 'a'))
```

`dictdiffer.revert` (*diff_result*, *destination*, *in_place=False*)

Call swap function to revert patched dictionary object.

Usage example:

```
>>> from dictdiffer import diff, revert
>>> first = {'a': 'b'}
>>> second = {'a': 'c'}
>>> revert(diff(first, second), second)
{'a': 'b'}
```

Parameters

- **diff_result** – Changes returned by `diff`.
- **destination** – Structure to apply the changes to.
- **in_place** – By default, destination dictionary is deep copied before being reverted, and the copy is returned. Setting `in_place=True` means that revert will apply the changes directly to and return the destination structure.

`dictdiffer.dot_lookup` (*source*, *lookup*, *parent=False*)

Allow you to reach dictionary items with string or list lookup.

Recursively find value by lookup key split by `'.'`.

```
>>> from dictdiffer.utils import dot_lookup
>>> dot_lookup({'a': {'b': 'hello'}}, 'a.b')
'hello'
```

If parent argument is `True`, returns the parent node of matched object.

```
>>> dot_lookup({'a': {'b': 'hello'}}, 'a.b', parent=True)
{'b': 'hello'}
```

If node is empty value, returns the whole dictionary object.

```
>>> dot_lookup({'a': {'b': 'hello'}}, '')
{'a': {'b': 'hello'}}
```


Version 0.7.1 (released 2018-05-04)

- Resolves issue with keys containing dots. (#101)

Version 0.7.0 (released 2017-10-16)

- Fixes problem with diff results that reference the original structure by introduction of *deepcopy* for all possibly unhashable items. Thus the diff does not change later when the diffed structures change.
- Adds new option for patching and reverting patches in-place.
- Adds Python 3.6 to test matrix.
- Fixes the *ignore* argument when it contains a unicode value.

Version 0.6.1 (released 2016-11-22)

- Changes order of items for REMOVE section of generated patches when *swap* is called so the list items are removed from the end. (#85)
- Improves API documentation for *ignore* argument in *diff* function. (#79)
- Executes doctests during PyTest invocation.

Version 0.6.0 (released 2016-06-22)

- Adds support for comparing NumPy arrays. (#68)
- Adds support for comparing mutable mappings, sequences and sets from *collections.abc* module. (#67)
- Updates package structure, sorts imports and runs doctests.
- Fixes order in which handled conflicts are unified so that the Merger's *unified_patches* can be always applied.

Version 0.5.0 (released 2016-01-04)

- Adds tolerance parameter used when user wants to treat closed values as equals
- Adds support for comparing numerical values and NaN. (#54) (#55)

Version 0.4.0 (released 2015-03-11)

- Adds support for diffing and patching of sets. (#44)
- New tests for diff on the same lists. (#48)
- Fix for exception when dict has unicode keys and ignore parameter is provided. (#50)
- PEP8 improvements.

Version 0.3.0 (released 2014-11-05)

- Adds ignore argument to *diff* function that allows skipping check on specified keys. (#34 #35)
- Fix for diffing of dict or list subclasses. (#37)
- Better instance checking of diffing objects. (#39)

Version 0.2.0 (released 2014-09-29)

- Fix for empty list instructions. (#30)
- Regression test for empty list instructions.

Version 0.1.0 (released 2014-09-01)

- Fix for list removal issues during patching caused by wrong iteration. (#10)
- Fix for issues with multiple value types for the same key. (#10)
- Fix for issues with strings handled as iterables. (#6)
- Fix for integer keys. (#12)
- Regression test for complex dictionaries. (#4)
- Better testing with Travis CI, tox, pytest, code coverage. (#10)
- Initial release of documentation on ReadTheDocs. (#21 #24)
- Support for Python 3. (#15)

Version 0.0.4 (released 2014-01-04)

- List diff behavior treats lists as lists instead of sets. (#3)
- Differed typed objects are flagged as *changed* now.
- Swap function refactored.

Version 0.0.3 (released 2013-05-26)

- Initial public release on PyPI.

Bug reports, feature requests, and other contributions are welcome. If you find a demonstrable problem that is caused by the code of this library, please:

1. Search for [already reported problems](#).
2. Check if the issue has been fixed or is still reproducible on the latest *master* branch.
3. Create an issue with **a test case**.

If you create a feature branch, you can run the tests to ensure everything is operating correctly:

```
$ ./run-tests.sh
...
Name                Stmts  Miss  Cover  Missing
-----
dictdiffer/___init___  88     0  100%
dictdiffer/version     2     0  100%
-----
TOTAL                 90     0  100%
...
52 passed, 2 skipped in 0.44 seconds
```


CHAPTER 6

License

Dictdiffer is free software; you can redistribute it and/or modify it under the terms of the MIT License quoted below.

Copyright (C) 2013 Fatih Erikli. Copyright (C) 2013, 2014 CERN.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the “Software”), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED “AS IS”, WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

In applying this license, CERN does not waive the privileges and immunities granted to it by virtue of its status as an Intergovernmental Organization or submit itself to any jurisdiction.

CHAPTER 7

Authors

Dictdiffer was originally developed by Fatih Erikli. It is now being developed and maintained by the Invenio collaboration. You can contact us at info@inveniosoftware.org.

Contributors:

- Fatih Erikli <fatihrikli@gmail.com>
- Brian Rue <brianrue@gmail.com>
- Lars Holm Nielsen <lars.holm.nielsen@cern.ch>
- Tibor Simko <tibor.simko@cern.ch>
- Jiri Kuncar <jiri.kuncar@gmail.com>
- Jason Peddle <jwpeddle@gmail.com>
- Martin Vesper <martin.vesper@cern.ch>
- Gilles DAVID <frodon1@gmail.com>
- Alexander Mohr <amohr@farmersbusinessnetwork.com>

d

`dictdiffer`, 7

D

dictdiffer (module), 7

diff() (in module dictdiffer), 7

dot_lookup() (in module dictdiffer), 9

P

patch() (in module dictdiffer), 8

R

revert() (in module dictdiffer), 9

S

swap() (in module dictdiffer), 8