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# Dictdiffer Documentation

*Release 0.6.0*

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June 23, 2016



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



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# Installation

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Dictdiffer is on PyPI so all you need is:

```
$ pip install dictdiffer
```





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## Usage

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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 iterator with differences between two dictionaries.

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

**PathLimit:**

```
>>> 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')])]
```

**Expand:**

```
... list(diff({}, {'foo': 'bar', 'apple': 'mango'})) [('add', '', [(('foo', 'bar'), ('apple', 'mango'))])]
```

```
... list(diff({}, {'foo': 'bar', 'apple': 'mango'}, expand=True)) [('add', '', [(('foo', 'bar')], ('add', '',
[(('apple', 'mango'))])]
```

### Parameters

- **first** – original dictionary, list or set
- **second** – new dictionary, list or set
- **node** – key for comparison that can be used in `dot_lookup()`

- **ignore** – list 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** – Expands the patches
- **tolerance** – threshold to consider 2 values identical

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.

`dictdiffer.patch(diff_result, destination)`

Patch the diff result to the old dictionary.

`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'))])
>>> next(swapped)
('remove', 'a.b.c', ('a', 'b'))
```

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

`dictdiffer.revert(diff_result, destination)`

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'}
```

`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'}}
```



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## Changes

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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.



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## Contributing

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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
```



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### License

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

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### Authors

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