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Dictdiffer is a helper module that helps you to diff and patch dictionaries.
Dictdiffer is on PyPI so all you need is:

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

```python
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:

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

assert patched == second
```

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

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

assert list(swapped) == [
    ('change', ['settings', 'assignees', 2], (202, 201)),
]```
Let's revert the last changes:

```python
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:

```python
first = {'a': 10.0}
second = {'a': 10.5}
result = diff(first, second, tolerance=0.1)
assert list(result) == []
```

Now with a tolerance of 1%:

```python
result = diff(first, second, tolerance=0.01)
assert list(result) == ('change', 'a', (10.0, 10.5))
```
 Dictdiff is a helper module to diff and patch dictionaries.

\[
\text{dictdiffer}.\text{diff}(\text{first}, \text{second}, \text{node=None, ignore=None, path_limit=None, expand=False, tolerance=2.220446049250313e-16})
\]

Compare two dictionary/list/set objects, and returns a diff result.

Return iterator with differences between two dictionaries.

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

PathLimit:

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

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

```python
dictdiffer.patch(diff_result, destination)
```
Patch the diff result to the old dictionary.

```python
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.

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

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

```python
dictdiffer.revert(diff_result, destination)
```
Call swap function to revert patched dictionary object.

Usage example:

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

```python
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 "."

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

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

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

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

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

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.
Contributing

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
```
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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