
Slotted

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CONTENTS

1	Overview	3
2	Motivation	5
3	Examples	7
3.1	abc	8
4	Documentation	9
4.1	slotted package	9
5	Indices and Tables	13
	Python Module Index	15
	Index	17

OVERVIEW

Enforces usage of `__slots__` for Python classes.

MOTIVATION

Besides the performance benefits, using `__slots__` also prevents the client code from setting attributes that were not initially defined for instances of classes, which usually happens by mistake especially in environments where static type checking is not being performed.

So forcing it upon a class and its subclasses might be a desirable thing to do for classes that are part of an API, for example.

EXAMPLES

When defining a Slotted class with no `__slots__` declaration, it assumes it has empty slots, which is equivalent to declaring `__slots__ = ()`.

```
>>> from slotted import Slotted

>>> class Foo(Slotted):
...     pass # implicit declaration of __slots__ = ()
...
>>> foo = Foo()
>>> foo.bar = 1
Traceback (most recent call last):
AttributeError: 'Foo' object has no attribute 'bar'
```

Slotted classes can be mixed with regular classes as long as they and all of their bases implement `__slots__`.

```
>>> from slotted import Slotted

>>> class Bar(object):
...     __slots__ = ("bar",)
>>> class Foo(Bar, Slotted):
...     __slots__ = ("foo",)
...
>>> foo = Foo()
```

If any non-Slotted class anywhere in the chain does not implement `__slots__`, a `TypeError` exception is raised.

```
>>> from slotted import Slotted

>>> class Bar(object):
...     pass
>>> class Foo(Bar, Slotted):
...     __slots__ = ("foo",)
...
Traceback (most recent call last):
TypeError: base 'Bar' is not slotted
```

Slotted behavior can also be achieved by using the `SlottedMeta` metaclass.

```
>>> from six import with_metaclass
>>> from slotted import SlottedMeta
```

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```
>>> class Foo(metaclass=SlottedMeta, object):
...     pass # implicit declaration of __slots__ = ()
...
>>> foo = Foo()
>>> foo.bar = 1
Traceback (most recent call last):
AttributeError: 'Foo' object has no attribute 'bar'
```

3.1 abc

slotted also provides generic versions of the *collection.abc* classes.

```
>>> from typing import TypeVar
>>> from slotted import SlottedMapping, SlottedSequence, SlottedSet
>>> KT = TypeVar("KT")
>>> VT = TypeVar("VT")
>>> class MyMapping(SlottedMapping[KT, VT]):
...     pass # implicit declaration of __slots__ = ()
...
>>> class MySequence(SlottedSequence[VT]):
...     pass # implicit declaration of __slots__ = ()
...
>>> class MySet(SlottedSet[VT]):
...     pass # implicit declaration of __slots__ = ()
...
>>>
```

For Python 2.7, *slotted* adds a *SlottedCollection* class, even though the original *Collection* is not available.

```
>>> from typing import TypeVar
>>> from slotted import SlottedCollection
>>> T = TypeVar("T")
>>> class MyCollection(SlottedCollection[T]):
...     pass # implicit declaration of __slots__ = ()
...
>>>
```

DOCUMENTATION

4.1 slotted package

class `slotted.SlottedMeta(name, bases, dct, **kwargs)`

Bases: `type`

Metaclass that enforces `__slots__`.

class `slotted.Slotted`

Bases: `object`

Enforces `__slots__`.

`slotted.slots(cls, mangled=False)`

Get all slot names for a class.

Parameters

- **cls** – Class.
- **mangled** – Whether to mangle the protected names.

Returns

A set of slot names.

class `slotted.SlottedABCMeta(name, bases, dct, **kwargs)`

Bases: `SlottedMeta`, `ABCMeta`

Slotted version of `abc.ABCMeta`.

`slotted.SlottedABCGenericMeta`

alias of `SlottedABCMeta`

class `slotted.SlottedABC`

Bases: `Slotted`

Slotted version of `abc.ABC`.

class `slotted.SlottedCallable`

Bases: `SlottedABC`

Slotted version of `collections.abc.Callable`.

Metaclass: `slotted.SlottedABCMeta`

Inherits from:

- `slotted.SlottedABC`

```
class slotted.SlottedContainer(*args, **kwargs)
    Bases: SlottedContainer, Generic

class slotted.SlottedHashable
    Bases: SlottedABC
    Slotted version of collections.abc.Hashable.
    Metaclass: slotted.SlottedABCMeta
    Inherits from:
        • slotted.SlottedABC

class slotted.SlottedItemsView(mapping)
    Bases: SlottedItemsView, Generic

class slotted.SlottedIterable(*args, **kwargs)
    Bases: SlottedIterable, Generic

class slotted.SlottedIterator(*args, **kwargs)
    Bases: SlottedIterator, Generic

class slotted.SlottedKeysView(mapping)
    Bases: SlottedKeysView, Generic

class slotted.SlottedMapping(*args, **kwargs)
    Bases: SlottedMapping, Generic

class slotted.SlottedMappingView(mapping)
    Bases: SlottedMappingView, Generic

class slotted.SlottedMutableMapping(*args, **kwargs)
    Bases: SlottedMutableMapping, Generic

class slotted.SlottedMutableSequence(*args, **kwargs)
    Bases: SlottedMutableSequence, Generic

class slotted.SlottedMutableSet(*args, **kwargs)
    Bases: SlottedMutableSet, Generic

class slotted.SlottedReversible(*args, **kwargs)
    Bases: SlottedReversible, Generic

class slotted.SlottedSequence(*args, **kwargs)
    Bases: SlottedSequence, Generic

class slotted.SlottedSet(*args, **kwargs)
    Bases: SlottedSet, Generic

class slotted.SlottedSized
    Bases: SlottedABC
    Slotted version of collections.abc.Sized.
    Metaclass: slotted.SlottedABCMeta
    Inherits from:
        • slotted.SlottedABC
```

```
class slotted.SlottedValuesView(mapping)  
    Bases: SlottedValuesView, Generic  
class slotted.SlottedCollection(*args, **kws)  
    Bases: SlottedCollection, Generic
```


INDICES AND TABLES

- `genindex`
- `modindex`

PYTHON MODULE INDEX

S

slotted, [9](#)

INDEX

M

module

 slotted, 9

S

slots() (*in module slotted*), 9

slotted

 module, 9

Slotted (*class in slotted*), 9

SlottedABC (*class in slotted*), 9

SlottedABCGenericMeta (*in module slotted*), 9

SlottedABCMeta (*class in slotted*), 9

SlottedCallable (*class in slotted*), 9

SlottedCollection (*class in slotted*), 11

SlottedContainer (*class in slotted*), 9

SlottedHashable (*class in slotted*), 10

SlottedItemsView (*class in slotted*), 10

SlottedIterable (*class in slotted*), 10

SlottedIterator (*class in slotted*), 10

SlottedKeysView (*class in slotted*), 10

SlottedMapping (*class in slotted*), 10

SlottedMappingView (*class in slotted*), 10

SlottedMeta (*class in slotted*), 9

SlottedMutableMapping (*class in slotted*), 10

SlottedMutableSequence (*class in slotted*), 10

SlottedMutableSet (*class in slotted*), 10

SlottedReversible (*class in slotted*), 10

SlottedSequence (*class in slotted*), 10

SlottedSet (*class in slotted*), 10

SlottedSized (*class in slotted*), 10

SlottedValuesView (*class in slotted*), 10