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# **versions Documentation**

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# Contents

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Quick examples:

- Compare versions:

```
>>> from versions import Version
>>> Version.parse('2.0.0') > Version.parse('1.0.0')
True
```

- Test if constraints are satisfied by a version:

```
>>> from versions import Constraint, Constraints
>>> '2.0' in Constraint.parse('>1')
True
>>> '1.5' in Constraints.parse('>1,<2')
True
```



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# Contents

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## 1.1 Quickstart

### 1.1.1 Basic usage

Version comparison examples:

```
>>> from versions import Version
>>> v1 = Version.parse('1')
>>> v2 = Version.parse('2')
>>> v1 == v2
False
>>> v1 != v2
True
>>> v1 > v2
False
>>> v1 < v2
True
>>> v1 >= v2
False
>>> v1 <= v2
True
```

`Version.parse` expects a [Semantic Version 2.0](#) string and returns a corresponding `Version` object:

```
>>> from versions import Version
>>> v = Version.parse('1.2.0-dev+foo.bar')
>>> v.major, v.minor, v.patch, v.prerelease, v.build_metadata
(1, 2, 0, 'dev', set(['foo', 'bar']))
```

If it isn't a semantic version string, the parser tries to normalize it:

```
>>> v = Version.parse('1')
>>> v.major, v.minor, v.patch, v.prerelease, v.build_metadata
(1, 0, 0, None, None)
```

## 1.1.2 Version constraint matching

versions also implements version constraint parsing and evaluation:

```
>>> from versions import Constraint
>>> Constraint.parse('>1').match('2')
True
>>> Constraint.parse('<2').match(Version.parse('1'))
True
```

For convenience, constraint matching can be tested using the `in` operator:

```
>>> '1.5' in Constraint.parse('<2')
True
>>> Version('2') in Constraint.parse('!=2')
False
```

Constraints can be merged using Constraints:

```
>>> from versions import Constraints
>>> '1.0' in Constraints.parse('>1,<2')
False
>>> '1.5' in Constraints.parse('>1,<2')
True
>>> '2.0' in Constraints.parse('>1,<2')
False
```

## 1.2 API

Modules:

### 1.2.1 version

#### Version

**class** `versions.version.Version` (*major*, *minor=0*, *patch=0*, *prerelease=None*,  
*build\_metadata=None*)

A package version.

#### Parameters

- **major** (*int*) – Version major number
- **minor** (*int*) – Version minor number
- **patch** (*int*) – Version patch number
- **prerelease** (*str*, *int* or *None*) – Version prerelease
- **build\_metadata** (*None* or *str*) – Version build metadata

This class constructor is usually not called directly. For version string parsing, see `Version.parse`.

**classmethod** `parse` (*version\_string*)

Parses a *version\_string* and returns a `Version` object:

```
>>> Version.parse('1.0.0') > Version.parse('0.1')
```

```
True
```



## Comparison

Version objects are comparable with standard operators:

```
>>> from versions import Version
>>> v1 = Version(1)
>>> v2 = Version(2)
>>> v1 == v2
False
>>> v1 != v2
True
>>> v1 > v2
False
>>> v1 < v2
True
>>> v1 >= v2
False
>>> v1 <= v2
True
```

## Parsing

Version has a convenient *parse* static method to parse constraints strings into Version objects.

The parser does its best to normalize the passed in string into a [Semantic Version 2.0](#) version:

```
>>> from versions import Version
>>> Version.parse('1')
Version.parse('1.0.0')
>>> Version.parse('1.0')
Version.parse('1.0.0')
>>> Version.parse('1.0.0')
Version.parse('1.0.0')
>>> Version.parse('1.0.0-dev')
Version.parse('1.0.0-dev')
>>> Version.parse('1.0.0+some.build.data')
Version.parse('1.0.0+build.data.some')
>>> Version.parse('1.0.0-alpha+some.build.data')
Version.parse('1.0.0-alpha+build.data.some')
>>> Version.parse('1.0.0-42')
Version.parse('1.0.0-42')
```

## InvalidVersion

**exception** `versions.version.InvalidVersion` (*version*)

Raised when failing to parse a version.

**version** = `None`

The bogus version.

## 1.2.2 constraint

### Constraint

**class** `versions.constraint.Constraint` (*operator*, *version*)

A constraint on a package version.

#### Parameters

- **operator** (`Operator`) – The constraint operator.
- **version** (`Version`) – The constraint version.

**match** (*version*)

Match *version* with the constraint.

**Parameters** **version** (version string or `Version`) – Version to match against the constraint.

**Return type** `True` if *version* satisfies the constraint, `False` if it doesn't.

**classmethod** **parse** (*constraint\_string*)

Parses a constraint string and returns a `Constraint` object.

**Raises** `InvalidConstraint` when parsing fails.

### Parsing

`Constraint` has a convenient *parse* static method to parse constraints strings into `Constraint` objects.

Constraint strings are composed of a constraint operator, followed by a valid version string.

Valid constraint operators: `==`, `!=`, `<`, `>`, `<=` and `>=`.

### Matching

Examples:

```
>>> from versions import Constraint, Version
>>> Constraint.parse('>1').match('2')
True
>>> Constraint.parse('<2').match(Version.parse('1'))
True
>>> '1.5' in Constraint.parse('== 1.0')
False
>>> Version(1, 5) in Constraint.parse('> 1.0')
True
>>> Version(1) in Constraint.parse('>= 2.0.0')
False
```

### InvalidConstraint

**exception** `versions.constraint.InvalidConstraint` (*constraint*)

Raised when failing to parse a constraint.

**constraint** = `None`

The bogus constraint.

## 1.2.3 constraints

### Constraints

**class** `versions.constraints.Constraints` (*constraints=None*)

A collection of Constraint objects.

**match** (*version*)

Match *version* with this collection of constraints.

**Parameters** *version* (version string or `Version`) – Version to match against this collection of constraints.

**Return type** `True` if *version* satisfies this collection of constraint, `False` if it doesn't.

**classmethod** **parse** (*constraints\_string*)

Parses a *constraints\_string* and returns a `Constraints` object.

### Merging

Constraint objects can be merged using a `Constraints` object and the `+` operator:

```
>>> from versions import Constraints, Constraint
>>> Constraints() + Constraint.parse('<2') + Constraint.parse('!=1.5')
Constraints.parse('<2.0.0,!=1.5.0')
```

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**Note:** The `Constraints` object must be on the left side of the `+` operator. The `Constraint` object must be on right side.

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If the constraint is a string, it is automatically parsed into a `Constraint` object. So the previous example can be shortened as:

```
>>> Constraints() + '<2' + '!=1.5'
Constraints.parse('<2.0.0,!=1.5.0')
```

### Matching

`Constraints` objects work like `Constraint` objects: they have a `match()` method which returns `True` when passed a `Version` matching all constraints:

```
>>> Constraints.parse('>=1,<2').match('1.4')
True
>>> '1.4' in Constraints.parse('>=1.2,<2,!=1.4')
False
```

### Conflicts

When merging conflicting constraints, an `ExclusiveConstraints` exception is raised:

```
>>> Constraints.parse('<1') + '>1'
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
  File "/Users/pmuller/dev/versions/versions/constraints.py", line 102, in __add__
    return Constraints(merge(self.constraints + [constraint]))
```

```
File "/Users/pmuller/dev/versions/versions/constraints.py", line 209, in merge
    raise ExclusiveConstraints(g_constraint, [l_constraint])
versions.constraints.ExclusiveConstraints: Constraint >1.0.0 conflicts with constraints <1.0.0
>>> Constraints.parse('<1') + '==1'
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
  File "/Users/pmuller/dev/versions/versions/constraints.py", line 102, in __add__
    return Constraints(merge(self.constraints + [constraint]))
  File "/Users/pmuller/dev/versions/versions/constraints.py", line 223, in merge
    raise ExclusiveConstraints(eq_constraint, conflict_list)
versions.constraints.ExclusiveConstraints: Constraint ==1.0.0 conflicts with constraints <1.0.0
>>> Constraints.parse('>=1') + '!=1' + '<=1'
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
  File "/Users/pmuller/dev/versions/versions/constraints.py", line 102, in __add__
    return Constraints(merge(self.constraints + [constraint]))
  File "/Users/pmuller/dev/versions/versions/constraints.py", line 223, in merge
    raise ExclusiveConstraints(eq_constraint, conflict_list)
versions.constraints.ExclusiveConstraints: Constraint ==1.0.0 conflicts with constraints !=1.0.0
```

**exception** `versions.constraints.ExclusiveConstraints` (*constraint, constraints*)

Raised when cannot merge a new constraint with pre-existing constraints.

**constraint** = `None`

The conflicting constraint.

**constraints** = `None`

The constraints with which it conflicts.

## 1.2.4 operators

### Operator

**class** `versions.operators.Operator` (*func, string*)

A package version constraint operator.

#### Parameters

- **func** (*callable*) – The operator callable.
- **string** (*str*) – The operator string representation.

**classmethod** `parse` (*string*)

Parses *string* and returns an `Operator` object.

**Raises** `InvalidOperator` If *string* is not a valid operator.

Valid operators are `==`, `!=`, `<`, `>`, `<=`, and `>=`.

### InvalidOperator

**exception** `versions.operators.InvalidOperator` (*operator*)

Raised when failing to parse an operator.

**operator** = `None`

The bogus operator.

## 1.2.5 packages

### Package

**class** `versions.packages.Package` (*name*, *version*)  
A package.

#### Parameters

- **name** (*str*) – Package name.
- **version** (*Version*) – Package version.

**name** = `None`

Package name

**version** = `None`

Package version

**classmethod** `parse` (*package\_string*)

Parses a *package\_string*.

**Parameters** `package_string` (*str*) – Package string expression.

**Return type** `Package`

### Parsing

Package can be represented as strings using this EBNF grammar:

```
package          ::= name version build_metadata_spec?
version          ::= [-A-Za-z0-9_.]+
build_metadata_spec ::= '+' [-A-Za-z0-9_.]+
```

Examples: `*foo 1.0.0*bar 1.0.0+some.build.options`

A package string can be parsed into a `Package` object Using *Package.parse*:

```
>>> from versions import Package
>>> package = Package.parse('foo 1.0.0+bar')
>>> package.name, package.version
('foo', Version.parse('1.0.0+bar'))
```

## 1.2.6 errors

### Error

**exception** `versions.errors.Error`  
An error occurred in versions.



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# Indices and tables

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- *genindex*
- *search*