```
>>> import traceback
>>> traceback.format_list([('spam.py', 3, '<module>', 'spam.eggs()'),
...                        ('eggs.py', 42, 'eggs', 'return "bacon"')])
['  File "spam.py", line 3, in <module>\n    spam.eggs()\n',
 '  File "eggs.py", line 42, in eggs\n    return "bacon"\n']
>>> an_error = IndexError('tuple index out of range')
>>> traceback.format_exception_only(type(an_error), an_error)
['IndexError: tuple index out of range\n']
```

29.11 __future__ — Future statement definitions

Source code: Lib/__future__.py

__future__ is a real module, and serves three purposes:

- To avoid confusing existing tools that analyze import statements and expect to find the modules they're importing.
- To ensure that future statements run under releases prior to 2.1 at least yield runtime exceptions (the import of *__future__* will fail, because there was no module of that name prior to 2.1).
- To document when incompatible changes were introduced, and when they will be — or were — made mandatory. This is a form of executable documentation, and can be inspected programmatically via importing *__future__* and examining its contents.

Each statement in `__future__.py` is of the form:

```
FeatureName = _Feature(OptionalRelease, MandatoryRelease,
                       CompilerFlag)
```

where, normally, *OptionalRelease* is less than *MandatoryRelease*, and both are 5-tuples of the same form as *sys.version_info*:

```
(PY_MAJOR_VERSION, # the 2 in 2.1.0a3; an int
 PY_MINOR_VERSION, # the 1; an int
 PY_MICRO_VERSION, # the 0; an int
 PY_RELEASE_LEVEL, # "alpha", "beta", "candidate" or "final"; string
 PY_RELEASE_SERIAL # the 3; an int
)
```

OptionalRelease records the first release in which the feature was accepted.

In the case of a *MandatoryRelease* that has not yet occurred, *MandatoryRelease* predicts the release in which the feature will become part of the language.

Else *MandatoryRelease* records when the feature became part of the language; in releases at or after that, modules no longer need a future statement to use the feature in question, but may continue to use such imports.

MandatoryRelease may also be `None`, meaning that a planned feature got dropped.

Instances of class `_Feature` have two corresponding methods, `getOptionalRelease()` and `getMandatoryRelease()`.

CompilerFlag is the (bitfield) flag that should be passed in the fourth argument to the built-in function *compile()* to enable the feature in dynamically compiled code. This flag is stored in the `compiler_flag` attribute on `_Feature` instances.

No feature description will ever be deleted from *__future__*. Since its introduction in Python 2.1 the following features have found their way into the language using this mechanism:

feature	optional in	mandatory in	effect
nested_scopes	2.1.0b1	2.2	**PEP 227**: *Statically Nested Scopes*
generators	2.2.0a1	2.3	**PEP 255**: *Simple Generators*
division	2.2.0a2	3.0	**PEP 238**: *Changing the Division Operator*
absolute_import	2.5.0a1	3.0	**PEP 328**: *Imports: Multi-Line and Absolute/Relative*
with_statement	2.5.0a1	2.6	**PEP 343**: *The "with" Statement*
print_function	2.6.0a2	3.0	**PEP 3105**: *Make print a function*
unicode_literals	2.6.0a2	3.0	**PEP 3112**: *Bytes literals in Python 3000*
generator_stop	3.5.0b1	3.7	**PEP 479**: *StopIteration handling inside generators*
annotations	3.7.0b1	TBD[1]	**PEP 563**: *Postponed evaluation of annotations*

See also:

future How the compiler treats future imports.

29.12 gc — Garbage Collector interface

This module provides an interface to the optional garbage collector. It provides the ability to disable the collector, tune the collection frequency, and set debugging options. It also provides access to unreachable objects that the collector found but cannot free. Since the collector supplements the reference counting already used in Python, you can disable the collector if you are sure your program does not create reference cycles. Automatic collection can be disabled by calling `gc.disable()`. To debug a leaking program call `gc.set_debug(gc.DEBUG_LEAK)`. Notice that this includes `gc.DEBUG_SAVEALL`, causing garbage-collected objects to be saved in gc.garbage for inspection.

The *gc* module provides the following functions:

`gc.`**`enable`**`()`

Enable automatic garbage collection.

`gc.`**`disable`**`()`

Disable automatic garbage collection.

`gc.`**`isenabled`**`()`

Return `True` if automatic collection is enabled.

`gc.`**`collect`**`(`*generation=2*`)`

With no arguments, run a full collection. The optional argument *generation* may be an integer specifying which generation to collect (from 0 to 2). A *ValueError* is raised if the generation number is invalid. The number of unreachable objects found is returned.

The free lists maintained for a number of built-in types are cleared whenever a full collection or collection of the highest generation (2) is run. Not all items in some free lists may be freed due to the particular implementation, in particular *float*.

The effect of calling `gc.collect()` while the interpreter is already performing a collection is undefined.

`gc.`**`set_debug`**`(`*flags*`)`

Set the garbage collection debugging flags. Debugging information will be written to `sys.stderr`. See below for a list of debugging flags which can be combined using bit operations to control debugging.

`gc.`**`get_debug`**`()`

Return the debugging flags currently set.

[1] `from __future__ import annotations` was previously scheduled to become mandatory in Python 3.10, but the Python Steering Council twice decided to delay the change (announcement for Python 3.10; announcement for Python 3.11). No final decision has been made yet. See also **PEP 563** and **PEP 649**.