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|  |  |
|  | Introduction |
|  | ============ |
|  |  |
|  | This document gives coding conventions for the Python code comprising |
|  | the standard library in the main Python distribution. Please see the |
|  | companion informational PEP describing style guidelines for the C code |
|  | in the C implementation of Python [1]\_. |
|  |  |
|  | This document and PEP 257 (Docstring Conventions) were adapted from |
|  | Guido's original Python Style Guide essay, with some additions from |
|  | Barry's style guide [2]\_. |
|  |  |
|  | This style guide evolves over time as additional conventions are |
|  | identified and past conventions are rendered obsolete by changes in |
|  | the language itself. |
|  |  |
|  | Many projects have their own coding style guidelines. In the event of any |
|  | conflicts, such project-specific guides take precedence for that project. |
|  |  |
|  |  |
|  | A Foolish Consistency is the Hobgoblin of Little Minds |
|  | ====================================================== |
|  |  |
|  | One of Guido's key insights is that code is read much more often than |
|  | it is written. The guidelines provided here are intended to improve |
|  | the readability of code and make it consistent across the wide |
|  | spectrum of Python code. As PEP 20 says, "Readability counts". |
|  |  |
|  | A style guide is about consistency. Consistency with this style guide |
|  | is important. Consistency within a project is more important. |
|  | Consistency within one module or function is the most important. |
|  |  |
|  | However, know when to be inconsistent -- sometimes style guide |
|  | recommendations just aren't applicable. When in doubt, use your best |
|  | judgment. Look at other examples and decide what looks best. And |
|  | don't hesitate to ask! |
|  |  |
|  | In particular: do not break backwards compatibility just to comply with |
|  | this PEP! |
|  |  |
|  | Some other good reasons to ignore a particular guideline: |
|  |  |
|  | 1. When applying the guideline would make the code less readable, even |
|  | for someone who is used to reading code that follows this PEP. |
|  |  |
|  | 2. To be consistent with surrounding code that also breaks it (maybe |
|  | for historic reasons) -- although this is also an opportunity to |
|  | clean up someone else's mess (in true XP style). |
|  |  |
|  | 3. Because the code in question predates the introduction of the |
|  | guideline and there is no other reason to be modifying that code. |
|  |  |
|  | 4. When the code needs to remain compatible with older versions of |
|  | Python that don't support the feature recommended by the style guide. |
|  |  |
|  |  |
|  | Code lay-out |
|  | ============ |
|  |  |
|  | Indentation |
|  | ----------- |
|  |  |
|  | Use 4 spaces per indentation level. |
|  |  |
|  | Continuation lines should align wrapped elements either vertically |
|  | using Python's implicit line joining inside parentheses, brackets and |
|  | braces, or using a \*hanging indent\* [#fn-hi]\_. When using a hanging |
|  | indent the following should be considered; there should be no |
|  | arguments on the first line and further indentation should be used to |
|  | clearly distinguish itself as a continuation line. |
|  |  |
|  | Yes:: |
|  |  |
|  | # Aligned with opening delimiter. |
|  | foo = long\_function\_name(var\_one, var\_two, |
|  | var\_three, var\_four) |
|  |  |
|  | # More indentation included to distinguish this from the rest. |
|  | def long\_function\_name( |
|  | var\_one, var\_two, var\_three, |
|  | var\_four): |
|  | print(var\_one) |
|  |  |
|  | # Hanging indents should add a level. |
|  | foo = long\_function\_name( |
|  | var\_one, var\_two, |
|  | var\_three, var\_four) |
|  |  |
|  | No:: |
|  |  |
|  | # Arguments on first line forbidden when not using vertical alignment. |
|  | foo = long\_function\_name(var\_one, var\_two, |
|  | var\_three, var\_four) |
|  |  |
|  | # Further indentation required as indentation is not distinguishable. |
|  | def long\_function\_name( |
|  | var\_one, var\_two, var\_three, |
|  | var\_four): |
|  | print(var\_one) |
|  |  |
|  | The 4-space rule is optional for continuation lines. |
|  |  |
|  | Optional:: |
|  |  |
|  | # Hanging indents \*may\* be indented to other than 4 spaces. |
|  | foo = long\_function\_name( |
|  | var\_one, var\_two, |
|  | var\_three, var\_four) |
|  |  |
|  | .. \_`multiline if-statements`: |
|  |  |
|  | When the conditional part of an ``if``-statement is long enough to require |
|  | that it be written across multiple lines, it's worth noting that the |
|  | combination of a two character keyword (i.e. ``if``), plus a single space, |
|  | plus an opening parenthesis creates a natural 4-space indent for the |
|  | subsequent lines of the multiline conditional. This can produce a visual |
|  | conflict with the indented suite of code nested inside the ``if``-statement, |
|  | which would also naturally be indented to 4 spaces. This PEP takes no |
|  | explicit position on how (or whether) to further visually distinguish such |
|  | conditional lines from the nested suite inside the ``if``-statement. |
|  | Acceptable options in this situation include, but are not limited to:: |
|  |  |
|  | # No extra indentation. |
|  | if (this\_is\_one\_thing and |
|  | that\_is\_another\_thing): |
|  | do\_something() |
|  |  |
|  | # Add a comment, which will provide some distinction in editors |
|  | # supporting syntax highlighting. |
|  | if (this\_is\_one\_thing and |
|  | that\_is\_another\_thing): |
|  | # Since both conditions are true, we can frobnicate. |
|  | do\_something() |
|  |  |
|  | # Add some extra indentation on the conditional continuation line. |
|  | if (this\_is\_one\_thing |
|  | and that\_is\_another\_thing): |
|  | do\_something() |
|  |  |
|  | (Also see the discussion of whether to break before or after binary |
|  | operators below.) |
|  |  |
|  | The closing brace/bracket/parenthesis on multi-line constructs may |
|  | either line up under the first non-whitespace character of the last |
|  | line of list, as in:: |
|  |  |
|  | my\_list = [ |
|  | 1, 2, 3, |
|  | 4, 5, 6, |
|  | ] |
|  | result = some\_function\_that\_takes\_arguments( |
|  | 'a', 'b', 'c', |
|  | 'd', 'e', 'f', |
|  | ) |
|  |  |
|  | or it may be lined up under the first character of the line that |
|  | starts the multi-line construct, as in:: |
|  |  |
|  | my\_list = [ |
|  | 1, 2, 3, |
|  | 4, 5, 6, |
|  | ] |
|  | result = some\_function\_that\_takes\_arguments( |
|  | 'a', 'b', 'c', |
|  | 'd', 'e', 'f', |
|  | ) |
|  |  |
|  |  |
|  | Tabs or Spaces? |
|  | --------------- |
|  |  |
|  | Spaces are the preferred indentation method. |
|  |  |
|  | Tabs should be used solely to remain consistent with code that is |
|  | already indented with tabs. |
|  |  |
|  | Python 3 disallows mixing the use of tabs and spaces for indentation. |
|  |  |
|  | Python 2 code indented with a mixture of tabs and spaces should be |
|  | converted to using spaces exclusively. |
|  |  |
|  | When invoking the Python 2 command line interpreter with |
|  | the ``-t`` option, it issues warnings about code that illegally mixes |
|  | tabs and spaces. When using ``-tt`` these warnings become errors. |
|  | These options are highly recommended! |
|  |  |
|  |  |
|  | Maximum Line Length |
|  | ------------------- |
|  |  |
|  | Limit all lines to a maximum of 79 characters. |
|  |  |
|  | For flowing long blocks of text with fewer structural restrictions |
|  | (docstrings or comments), the line length should be limited to 72 |
|  | characters. |
|  |  |
|  | Limiting the required editor window width makes it possible to have |
|  | several files open side-by-side, and works well when using code |
|  | review tools that present the two versions in adjacent columns. |
|  |  |
|  | The default wrapping in most tools disrupts the visual structure of the |
|  | code, making it more difficult to understand. The limits are chosen to |
|  | avoid wrapping in editors with the window width set to 80, even |
|  | if the tool places a marker glyph in the final column when wrapping |
|  | lines. Some web based tools may not offer dynamic line wrapping at all. |
|  |  |
|  | Some teams strongly prefer a longer line length. For code maintained |
|  | exclusively or primarily by a team that can reach agreement on this |
|  | issue, it is okay to increase the nominal line length from 80 to |
|  | 100 characters (effectively increasing the maximum length to 99 |
|  | characters), provided that comments and docstrings are still wrapped |
|  | at 72 characters. |
|  |  |
|  | The Python standard library is conservative and requires limiting |
|  | lines to 79 characters (and docstrings/comments to 72). |
|  |  |
|  | The preferred way of wrapping long lines is by using Python's implied |
|  | line continuation inside parentheses, brackets and braces. Long lines |
|  | can be broken over multiple lines by wrapping expressions in |
|  | parentheses. These should be used in preference to using a backslash |
|  | for line continuation. |
|  |  |
|  | Backslashes may still be appropriate at times. For example, long, |
|  | multiple ``with``-statements cannot use implicit continuation, so |
|  | backslashes are acceptable:: |
|  |  |
|  | with open('/path/to/some/file/you/want/to/read') as file\_1, \ |
|  | open('/path/to/some/file/being/written', 'w') as file\_2: |
|  | file\_2.write(file\_1.read()) |
|  |  |
|  | (See the previous discussion on `multiline if-statements`\_ for further |
|  | thoughts on the indentation of such multiline ``with``-statements.) |
|  |  |
|  | Another such case is with ``assert`` statements. |
|  |  |
|  | Make sure to indent the continued line appropriately. |
|  |  |
|  |  |
|  | Should a line break before or after a binary operator? |
|  | ------------------------------------------------------ |
|  |  |
|  | For decades the recommended style was to break after binary operators. |
|  | But this can hurt readability in two ways: the operators tend to get |
|  | scattered across different columns on the screen, and each operator is |
|  | moved away from its operand and onto the previous line. Here, the eye |
|  | has to do extra work to tell which items are added and which are |
|  | subtracted:: |
|  |  |
|  | # No: operators sit far away from their operands |
|  | income = (gross\_wages + |
|  | taxable\_interest + |
|  | (dividends - qualified\_dividends) - |
|  | ira\_deduction - |
|  | student\_loan\_interest) |
|  |  |
|  | To solve this readability problem, mathematicians and their publishers |
|  | follow the opposite convention. Donald Knuth explains the traditional |
|  | rule in his \*Computers and Typesetting\* series: "Although formulas |
|  | within a paragraph always break after binary operations and relations, |
|  | displayed formulas always break before binary operations" [3]\_. |
|  |  |
|  | Following the tradition from mathematics usually results in more |
|  | readable code:: |
|  |  |
|  | # Yes: easy to match operators with operands |
|  | income = (gross\_wages |
|  | + taxable\_interest |
|  | + (dividends - qualified\_dividends) |
|  | - ira\_deduction |
|  | - student\_loan\_interest) |
|  |  |
|  | In Python code, it is permissible to break before or after a binary |
|  | operator, as long as the convention is consistent locally. For new |
|  | code Knuth's style is suggested. |
|  |  |
|  |  |
|  | Blank Lines |
|  | ----------- |
|  |  |
|  | Surround top-level function and class definitions with two blank |
|  | lines. |
|  |  |
|  | Method definitions inside a class are surrounded by a single blank |
|  | line. |
|  |  |
|  | Extra blank lines may be used (sparingly) to separate groups of |
|  | related functions. Blank lines may be omitted between a bunch of |
|  | related one-liners (e.g. a set of dummy implementations). |
|  |  |
|  | Use blank lines in functions, sparingly, to indicate logical sections. |
|  |  |
|  | Python accepts the control-L (i.e. ^L) form feed character as |
|  | whitespace; Many tools treat these characters as page separators, so |
|  | you may use them to separate pages of related sections of your file. |
|  | Note, some editors and web-based code viewers may not recognize |
|  | control-L as a form feed and will show another glyph in its place. |
|  |  |
|  |  |
|  | Source File Encoding |
|  | -------------------- |
|  |  |
|  | Code in the core Python distribution should always use UTF-8 (or ASCII |
|  | in Python 2). |
|  |  |
|  | Files using ASCII (in Python 2) or UTF-8 (in Python 3) should not have |
|  | an encoding declaration. |
|  |  |
|  | In the standard library, non-default encodings should be used only for |
|  | test purposes or when a comment or docstring needs to mention an author |
|  | name that contains non-ASCII characters; otherwise, using ``\x``, |
|  | ``\u``, ``\U``, or ``\N`` escapes is the preferred way to include |
|  | non-ASCII data in string literals. |
|  |  |
|  | For Python 3.0 and beyond, the following policy is prescribed for the |
|  | standard library (see PEP 3131): All identifiers in the Python |
|  | standard library MUST use ASCII-only identifiers, and SHOULD use |
|  | English words wherever feasible (in many cases, abbreviations and |
|  | technical terms are used which aren't English). In addition, string |
|  | literals and comments must also be in ASCII. The only exceptions are |
|  | (a) test cases testing the non-ASCII features, and |
|  | (b) names of authors. Authors whose names are not based on the |
|  | latin alphabet MUST provide a latin transliteration of their |
|  | names. |
|  |  |
|  | Open source projects with a global audience are encouraged to adopt a |
|  | similar policy. |
|  |  |
|  |  |
|  | Imports |
|  | ------- |
|  |  |
|  | - Imports should usually be on separate lines, e.g.:: |
|  |  |
|  | Yes: import os |
|  | import sys |
|  |  |
|  | No: import sys, os |
|  |  |
|  | It's okay to say this though:: |
|  |  |
|  | from subprocess import Popen, PIPE |
|  |  |
|  | - Imports are always put at the top of the file, just after any module |
|  | comments and docstrings, and before module globals and constants. |
|  |  |
|  | Imports should be grouped in the following order: |
|  |  |
|  | 1. standard library imports |
|  | 2. related third party imports |
|  | 3. local application/library specific imports |
|  |  |
|  | You should put a blank line between each group of imports. |
|  |  |
|  | - Absolute imports are recommended, as they are usually more readable |
|  | and tend to be better behaved (or at least give better error |
|  | messages) if the import system is incorrectly configured (such as |
|  | when a directory inside a package ends up on ``sys.path``):: |
|  |  |
|  | import mypkg.sibling |
|  | from mypkg import sibling |
|  | from mypkg.sibling import example |
|  |  |
|  | However, explicit relative imports are an acceptable alternative to |
|  | absolute imports, especially when dealing with complex package layouts |
|  | where using absolute imports would be unnecessarily verbose:: |
|  |  |
|  | from . import sibling |
|  | from .sibling import example |
|  |  |
|  | Standard library code should avoid complex package layouts and always |
|  | use absolute imports. |
|  |  |
|  | Implicit relative imports should \*never\* be used and have been removed |
|  | in Python 3. |
|  |  |
|  | - When importing a class from a class-containing module, it's usually |
|  | okay to spell this:: |
|  |  |
|  | from myclass import MyClass |
|  | from foo.bar.yourclass import YourClass |
|  |  |
|  | If this spelling causes local name clashes, then spell them :: |
|  |  |
|  | import myclass |
|  | import foo.bar.yourclass |
|  |  |
|  | and use "myclass.MyClass" and "foo.bar.yourclass.YourClass". |
|  |  |
|  | - Wildcard imports (``from <module> import \*``) should be avoided, as |
|  | they make it unclear which names are present in the namespace, |
|  | confusing both readers and many automated tools. There is one |
|  | defensible use case for a wildcard import, which is to republish an |
|  | internal interface as part of a public API (for example, overwriting |
|  | a pure Python implementation of an interface with the definitions |
|  | from an optional accelerator module and exactly which definitions |
|  | will be overwritten isn't known in advance). |
|  |  |
|  | When republishing names this way, the guidelines below regarding |
|  | public and internal interfaces still apply. |
|  |  |
|  |  |
|  | Module level dunder names |
|  | ------------------------- |
|  |  |
|  | Module level "dunders" (i.e. names with two leading and two trailing |
|  | underscores) such as ``\_\_all\_\_``, ``\_\_author\_\_``, ``\_\_version\_\_``, |
|  | etc. should be placed after the module docstring but before any import |
|  | statements \*except\* ``from \_\_future\_\_`` imports. Python mandates that |
|  | future-imports must appear in the module before any other code except |
|  | docstrings. |
|  |  |
|  | For example:: |
|  |  |
|  | """This is the example module. |
|  |  |
|  | This module does stuff. |
|  | """ |
|  |  |
|  | from \_\_future\_\_ import barry\_as\_FLUFL |
|  |  |
|  | \_\_all\_\_ = ['a', 'b', 'c'] |
|  | \_\_version\_\_ = '0.1' |
|  | \_\_author\_\_ = 'Cardinal Biggles' |
|  |  |
|  | import os |
|  | import sys |
|  |  |
|  |  |
|  | String Quotes |
|  | ============= |
|  |  |
|  | In Python, single-quoted strings and double-quoted strings are the |
|  | same. This PEP does not make a recommendation for this. Pick a rule |
|  | and stick to it. When a string contains single or double quote |
|  | characters, however, use the other one to avoid backslashes in the |
|  | string. It improves readability. |
|  |  |
|  | For triple-quoted strings, always use double quote characters to be |
|  | consistent with the docstring convention in PEP 257. |
|  |  |
|  |  |
|  | Whitespace in Expressions and Statements |
|  | ======================================== |
|  |  |
|  | Pet Peeves |
|  | ---------- |
|  |  |
|  | Avoid extraneous whitespace in the following situations: |
|  |  |
|  | - Immediately inside parentheses, brackets or braces. :: |
|  |  |
|  | Yes: spam(ham[1], {eggs: 2}) |
|  | No: spam( ham[ 1 ], { eggs: 2 } ) |
|  |  |
|  | - Between a trailing comma and a following close parenthesis. :: |
|  |  |
|  | Yes: foo = (0,) |
|  | No: bar = (0, ) |
|  |  |
|  | - Immediately before a comma, semicolon, or colon:: |
|  |  |
|  | Yes: if x == 4: print x, y; x, y = y, x |
|  | No: if x == 4 : print x , y ; x , y = y , x |
|  |  |
|  | - However, in a slice the colon acts like a binary operator, and |
|  | should have equal amounts on either side (treating it as the |
|  | operator with the lowest priority). In an extended slice, both |
|  | colons must have the same amount of spacing applied. Exception: |
|  | when a slice parameter is omitted, the space is omitted. |
|  |  |
|  | Yes:: |
|  |  |
|  | ham[1:9], ham[1:9:3], ham[:9:3], ham[1::3], ham[1:9:] |
|  | ham[lower:upper], ham[lower:upper:], ham[lower::step] |
|  | ham[lower+offset : upper+offset] |
|  | ham[: upper\_fn(x) : step\_fn(x)], ham[:: step\_fn(x)] |
|  | ham[lower + offset : upper + offset] |
|  |  |
|  | No:: |
|  |  |
|  | ham[lower + offset:upper + offset] |
|  | ham[1: 9], ham[1 :9], ham[1:9 :3] |
|  | ham[lower : : upper] |
|  | ham[ : upper] |
|  |  |
|  | - Immediately before the open parenthesis that starts the argument |
|  | list of a function call:: |
|  |  |
|  | Yes: spam(1) |
|  | No: spam (1) |
|  |  |
|  | - Immediately before the open parenthesis that starts an indexing or |
|  | slicing:: |
|  |  |
|  | Yes: dct['key'] = lst[index] |
|  | No: dct ['key'] = lst [index] |
|  |  |
|  | - More than one space around an assignment (or other) operator to |
|  | align it with another. |
|  |  |
|  | Yes:: |
|  |  |
|  | x = 1 |
|  | y = 2 |
|  | long\_variable = 3 |
|  |  |
|  | No:: |
|  |  |
|  | x = 1 |
|  | y = 2 |
|  | long\_variable = 3 |
|  |  |
|  |  |
|  | Other Recommendations |
|  | --------------------- |
|  |  |
|  | - Avoid trailing whitespace anywhere. Because it's usually invisible, |
|  | it can be confusing: e.g. a backslash followed by a space and a |
|  | newline does not count as a line continuation marker. Some editors |
|  | don't preserve it and many projects (like CPython itself) have |
|  | pre-commit hooks that reject it. |
|  |  |
|  | - Always surround these binary operators with a single space on either |
|  | side: assignment (``=``), augmented assignment (``+=``, ``-=`` |
|  | etc.), comparisons (``==``, ``<``, ``>``, ``!=``, ``<>``, ``<=``, |
|  | ``>=``, ``in``, ``not in``, ``is``, ``is not``), Booleans (``and``, |
|  | ``or``, ``not``). |
|  |  |
|  | - If operators with different priorities are used, consider adding |
|  | whitespace around the operators with the lowest priority(ies). Use |
|  | your own judgment; however, never use more than one space, and |
|  | always have the same amount of whitespace on both sides of a binary |
|  | operator. |
|  |  |
|  | Yes:: |
|  |  |
|  | i = i + 1 |
|  | submitted += 1 |
|  | x = x\*2 - 1 |
|  | hypot2 = x\*x + y\*y |
|  | c = (a+b) \* (a-b) |
|  |  |
|  | No:: |
|  |  |
|  | i=i+1 |
|  | submitted +=1 |
|  | x = x \* 2 - 1 |
|  | hypot2 = x \* x + y \* y |
|  | c = (a + b) \* (a - b) |
|  |  |
|  | - Don't use spaces around the ``=`` sign when used to indicate a |
|  | keyword argument or a default parameter value. |
|  |  |
|  | Yes:: |
|  |  |
|  | def complex(real, imag=0.0): |
|  | return magic(r=real, i=imag) |
|  |  |
|  | No:: |
|  |  |
|  | def complex(real, imag = 0.0): |
|  | return magic(r = real, i = imag) |
|  |  |
|  | - Function annotations should use the normal rules for colons and |
|  | always have spaces around the ``->`` arrow if present. (See |
|  | `Function Annotations`\_ below for more about function annotations.) |
|  |  |
|  | Yes:: |
|  |  |
|  | def munge(input: AnyStr): ... |
|  | def munge() -> AnyStr: ... |
|  |  |
|  | No:: |
|  |  |
|  | def munge(input:AnyStr): ... |
|  | def munge()->PosInt: ... |
|  |  |
|  | - When combining an argument annotation with a default value, use |
|  | spaces around the ``=`` sign (but only for those arguments that have |
|  | both an annotation and a default). |
|  |  |
|  | Yes:: |
|  |  |
|  | def munge(sep: AnyStr = None): ... |
|  | def munge(input: AnyStr, sep: AnyStr = None, limit=1000): ... |
|  |  |
|  | No:: |
|  |  |
|  | def munge(input: AnyStr=None): ... |
|  | def munge(input: AnyStr, limit = 1000): ... |
|  |  |
|  | - Compound statements (multiple statements on the same line) are |
|  | generally discouraged. |
|  |  |
|  | Yes:: |
|  |  |
|  | if foo == 'blah': |
|  | do\_blah\_thing() |
|  | do\_one() |
|  | do\_two() |
|  | do\_three() |
|  |  |
|  | Rather not:: |
|  |  |
|  | if foo == 'blah': do\_blah\_thing() |
|  | do\_one(); do\_two(); do\_three() |
|  |  |
|  | - While sometimes it's okay to put an if/for/while with a small body |
|  | on the same line, never do this for multi-clause statements. Also |
|  | avoid folding such long lines! |
|  |  |
|  | Rather not:: |
|  |  |
|  | if foo == 'blah': do\_blah\_thing() |
|  | for x in lst: total += x |
|  | while t < 10: t = delay() |
|  |  |
|  | Definitely not:: |
|  |  |
|  | if foo == 'blah': do\_blah\_thing() |
|  | else: do\_non\_blah\_thing() |
|  |  |
|  | try: something() |
|  | finally: cleanup() |
|  |  |
|  | do\_one(); do\_two(); do\_three(long, argument, |
|  | list, like, this) |
|  |  |
|  | if foo == 'blah': one(); two(); three() |
|  |  |
|  | When to use trailing commas |
|  | =========================== |
|  |  |
|  | Trailing commas are usually optional, except they are mandatory when |
|  | making a tuple of one element (and in Python 2 they have semantics for |
|  | the ``print`` statement). For clarity, it is recommended to surround |
|  | the latter in (technically redundant) parentheses. |
|  |  |
|  | Yes:: |
|  |  |
|  | FILES = ('setup.cfg',) |
|  |  |
|  | OK, but confusing:: |
|  |  |
|  | FILES = 'setup.cfg', |
|  |  |
|  | When trailing commas are redundant, they are often helpful when a |
|  | version control system is used, when a list of values, arguments or |
|  | imported items is expected to be extended over time. The pattern is |
|  | to put each value (etc.) on a line by itself, always adding a trailing |
|  | comma, and add the close parenthesis/bracket/brace on the next line. |
|  | However it does not make sense to have a trailing comma on the same |
|  | line as the closing delimiter (except in the above case of singleton |
|  | tuples). |
|  |  |
|  | Yes:: |
|  |  |
|  | FILES = [ |
|  | 'setup.cfg', |
|  | 'tox.ini', |
|  | ] |
|  | initialize(FILES, |
|  | error=True, |
|  | ) |
|  |  |
|  | No:: |
|  |  |
|  | FILES = ['setup.cfg', 'tox.ini',] |
|  | initialize(FILES, error=True,) |
|  |  |
|  |  |
|  | Comments |
|  | ======== |
|  |  |
|  | Comments that contradict the code are worse than no comments. Always |
|  | make a priority of keeping the comments up-to-date when the code |
|  | changes! |
|  |  |
|  | Comments should be complete sentences. If a comment is a phrase or |
|  | sentence, its first word should be capitalized, unless it is an |
|  | identifier that begins with a lower case letter (never alter the case |
|  | of identifiers!). |
|  |  |
|  | If a comment is short, the period at the end can be omitted. Block |
|  | comments generally consist of one or more paragraphs built out of |
|  | complete sentences, and each sentence should end in a period. |
|  |  |
|  | You should use two spaces after a sentence-ending period. |
|  |  |
|  | When writing English, follow Strunk and White. |
|  |  |
|  | Python coders from non-English speaking countries: please write your |
|  | comments in English, unless you are 120% sure that the code will never |
|  | be read by people who don't speak your language. |
|  |  |
|  | Block Comments |
|  | -------------- |
|  |  |
|  | Block comments generally apply to some (or all) code that follows |
|  | them, and are indented to the same level as that code. Each line of a |
|  | block comment starts with a ``#`` and a single space (unless it is |
|  | indented text inside the comment). |
|  |  |
|  | Paragraphs inside a block comment are separated by a line containing a |
|  | single ``#``. |
|  |  |
|  | Inline Comments |
|  | --------------- |
|  |  |
|  | Use inline comments sparingly. |
|  |  |
|  | An inline comment is a comment on the same line as a statement. |
|  | Inline comments should be separated by at least two spaces from the |
|  | statement. They should start with a # and a single space. |
|  |  |
|  | Inline comments are unnecessary and in fact distracting if they state |
|  | the obvious. Don't do this:: |
|  |  |
|  | x = x + 1 # Increment x |
|  |  |
|  | But sometimes, this is useful:: |
|  |  |
|  | x = x + 1 # Compensate for border |
|  |  |
|  | Documentation Strings |
|  | --------------------- |
|  |  |
|  | Conventions for writing good documentation strings |
|  | (a.k.a. "docstrings") are immortalized in PEP 257. |
|  |  |
|  | - Write docstrings for all public modules, functions, classes, and |
|  | methods. Docstrings are not necessary for non-public methods, but |
|  | you should have a comment that describes what the method does. This |
|  | comment should appear after the ``def`` line. |
|  |  |
|  | - PEP 257 describes good docstring conventions. Note that most |
|  | importantly, the ``"""`` that ends a multiline docstring should be |
|  | on a line by itself, e.g.:: |
|  |  |
|  | """Return a foobang |
|  |  |
|  | Optional plotz says to frobnicate the bizbaz first. |
|  | """ |
|  |  |
|  | - For one liner docstrings, please keep the closing ``"""`` on |
|  | the same line. |
|  |  |
|  |  |
|  | Naming Conventions |
|  | ================== |
|  |  |
|  | The naming conventions of Python's library are a bit of a mess, so |
|  | we'll never get this completely consistent -- nevertheless, here are |
|  | the currently recommended naming standards. New modules and packages |
|  | (including third party frameworks) should be written to these |
|  | standards, but where an existing library has a different style, |
|  | internal consistency is preferred. |
|  |  |
|  | Overriding Principle |
|  | -------------------- |
|  |  |
|  | Names that are visible to the user as public parts of the API should |
|  | follow conventions that reflect usage rather than implementation. |
|  |  |
|  | Descriptive: Naming Styles |
|  | -------------------------- |
|  |  |
|  | There are a lot of different naming styles. It helps to be able to |
|  | recognize what naming style is being used, independently from what |
|  | they are used for. |
|  |  |
|  | The following naming styles are commonly distinguished: |
|  |  |
|  | - ``b`` (single lowercase letter) |
|  | - ``B`` (single uppercase letter) |
|  | - ``lowercase`` |
|  | - ``lower\_case\_with\_underscores`` |
|  | - ``UPPERCASE`` |
|  | - ``UPPER\_CASE\_WITH\_UNDERSCORES`` |
|  | - ``CapitalizedWords`` (or CapWords, or CamelCase -- so named because |
|  | of the bumpy look of its letters [4]\_). This is also sometimes known |
|  | as StudlyCaps. |
|  |  |
|  | Note: When using abbreviations in CapWords, capitalize all the |
|  | letters of the abbreviation. Thus HTTPServerError is better than |
|  | HttpServerError. |
|  | - ``mixedCase`` (differs from CapitalizedWords by initial lowercase |
|  | character!) |
|  | - ``Capitalized\_Words\_With\_Underscores`` (ugly!) |
|  |  |
|  | There's also the style of using a short unique prefix to group related |
|  | names together. This is not used much in Python, but it is mentioned |
|  | for completeness. For example, the ``os.stat()`` function returns a |
|  | tuple whose items traditionally have names like ``st\_mode``, |
|  | ``st\_size``, ``st\_mtime`` and so on. (This is done to emphasize the |
|  | correspondence with the fields of the POSIX system call struct, which |
|  | helps programmers familiar with that.) |
|  |  |
|  | The X11 library uses a leading X for all its public functions. In |
|  | Python, this style is generally deemed unnecessary because attribute |
|  | and method names are prefixed with an object, and function names are |
|  | prefixed with a module name. |
|  |  |
|  | In addition, the following special forms using leading or trailing |
|  | underscores are recognized (these can generally be combined with any |
|  | case convention): |
|  |  |
|  | - ``\_single\_leading\_underscore``: weak "internal use" indicator. |
|  | E.g. ``from M import \*`` does not import objects whose name starts |
|  | with an underscore. |
|  |  |
|  | - ``single\_trailing\_underscore\_``: used by convention to avoid |
|  | conflicts with Python keyword, e.g. :: |
|  |  |
|  | Tkinter.Toplevel(master, class\_='ClassName') |
|  |  |
|  | - ``\_\_double\_leading\_underscore``: when naming a class attribute, |
|  | invokes name mangling (inside class FooBar, ``\_\_boo`` becomes |
|  | ``\_FooBar\_\_boo``; see below). |
|  |  |
|  | - ``\_\_double\_leading\_and\_trailing\_underscore\_\_``: "magic" objects or |
|  | attributes that live in user-controlled namespaces. |
|  | E.g. ``\_\_init\_\_``, ``\_\_import\_\_`` or ``\_\_file\_\_``. Never invent |
|  | such names; only use them as documented. |
|  |  |
|  | Prescriptive: Naming Conventions |
|  | -------------------------------- |
|  |  |
|  | Names to Avoid |
|  | ~~~~~~~~~~~~~~ |
|  |  |
|  | Never use the characters 'l' (lowercase letter el), 'O' (uppercase |
|  | letter oh), or 'I' (uppercase letter eye) as single character variable |
|  | names. |
|  |  |
|  | In some fonts, these characters are indistinguishable from the |
|  | numerals one and zero. When tempted to use 'l', use 'L' instead. |
|  |  |
|  | ASCII Compatibility |
|  | ~~~~~~~~~~~~~~~~~~~ |
|  |  |
|  | Identifiers used in the standard library must be ASCII compatible |
|  | as described in the |
|  | `policy section <https://www.python.org/dev/peps/pep-3131/#policy-specification>`\_ |
|  | of PEP 3131. |
|  |  |
|  | Package and Module Names |
|  | ~~~~~~~~~~~~~~~~~~~~~~~~ |
|  |  |
|  | Modules should have short, all-lowercase names. Underscores can be |
|  | used in the module name if it improves readability. Python packages |
|  | should also have short, all-lowercase names, although the use of |
|  | underscores is discouraged. |
|  |  |
|  | When an extension module written in C or C++ has an accompanying |
|  | Python module that provides a higher level (e.g. more object oriented) |
|  | interface, the C/C++ module has a leading underscore |
|  | (e.g. ``\_socket``). |
|  |  |
|  | Class Names |
|  | ~~~~~~~~~~~ |
|  |  |
|  | Class names should normally use the CapWords convention. |
|  |  |
|  | The naming convention for functions may be used instead in cases where |
|  | the interface is documented and used primarily as a callable. |
|  |  |
|  | Note that there is a separate convention for builtin names: most builtin |
|  | names are single words (or two words run together), with the CapWords |
|  | convention used only for exception names and builtin constants. |
|  |  |
|  | Type variable names |
|  | ~~~~~~~~~~~~~~~~~~~ |
|  |  |
|  | Names of type variables introduced in PEP 484 should normally use CapWords |
|  | preferring short names: ``T``, ``AnyStr``, ``Num``. It is recommended to add |
|  | suffixes ``\_co`` or ``\_contra`` to the variables used to declare covariant |
|  | or contravariant behavior correspondingly. Examples:: |
|  |  |
|  | from typing import TypeVar |
|  |  |
|  | VT\_co = TypeVar('VT\_co', covariant=True) |
|  | KT\_contra = TypeVar('KT\_contra', contravariant=True) |
|  |  |
|  | Exception Names |
|  | ~~~~~~~~~~~~~~~ |
|  |  |
|  | Because exceptions should be classes, the class naming convention |
|  | applies here. However, you should use the suffix "Error" on your |
|  | exception names (if the exception actually is an error). |
|  |  |
|  | Global Variable Names |
|  | ~~~~~~~~~~~~~~~~~~~~~ |
|  |  |
|  | (Let's hope that these variables are meant for use inside one module |
|  | only.) The conventions are about the same as those for functions. |
|  |  |
|  | Modules that are designed for use via ``from M import \*`` should use |
|  | the ``\_\_all\_\_`` mechanism to prevent exporting globals, or use the |
|  | older convention of prefixing such globals with an underscore (which |
|  | you might want to do to indicate these globals are "module |
|  | non-public"). |
|  |  |
|  | Function Names |
|  | ~~~~~~~~~~~~~~ |
|  |  |
|  | Function names should be lowercase, with words separated by |
|  | underscores as necessary to improve readability. |
|  |  |
|  | mixedCase is allowed only in contexts where that's already the |
|  | prevailing style (e.g. threading.py), to retain backwards |
|  | compatibility. |
|  |  |
|  | Function and method arguments |
|  | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ |
|  |  |
|  | Always use ``self`` for the first argument to instance methods. |
|  |  |
|  | Always use ``cls`` for the first argument to class methods. |
|  |  |
|  | If a function argument's name clashes with a reserved keyword, it is |
|  | generally better to append a single trailing underscore rather than |
|  | use an abbreviation or spelling corruption. Thus ``class\_`` is better |
|  | than ``clss``. (Perhaps better is to avoid such clashes by using a |
|  | synonym.) |
|  |  |
|  | Method Names and Instance Variables |
|  | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ |
|  |  |
|  | Use the function naming rules: lowercase with words separated by |
|  | underscores as necessary to improve readability. |
|  |  |
|  | Use one leading underscore only for non-public methods and instance |
|  | variables. |
|  |  |
|  | To avoid name clashes with subclasses, use two leading underscores to |
|  | invoke Python's name mangling rules. |
|  |  |
|  | Python mangles these names with the class name: if class Foo has an |
|  | attribute named ``\_\_a``, it cannot be accessed by ``Foo.\_\_a``. (An |
|  | insistent user could still gain access by calling ``Foo.\_Foo\_\_a``.) |
|  | Generally, double leading underscores should be used only to avoid |
|  | name conflicts with attributes in classes designed to be subclassed. |
|  |  |
|  | Note: there is some controversy about the use of \_\_names (see below). |
|  |  |
|  | Constants |
|  | ~~~~~~~~~ |
|  |  |
|  | Constants are usually defined on a module level and written in all |
|  | capital letters with underscores separating words. Examples include |
|  | ``MAX\_OVERFLOW`` and ``TOTAL``. |
|  |  |
|  | Designing for inheritance |
|  | ~~~~~~~~~~~~~~~~~~~~~~~~~ |
|  |  |
|  | Always decide whether a class's methods and instance variables |
|  | (collectively: "attributes") should be public or non-public. If in |
|  | doubt, choose non-public; it's easier to make it public later than to |
|  | make a public attribute non-public. |
|  |  |
|  | Public attributes are those that you expect unrelated clients of your |
|  | class to use, with your commitment to avoid backward incompatible |
|  | changes. Non-public attributes are those that are not intended to be |
|  | used by third parties; you make no guarantees that non-public |
|  | attributes won't change or even be removed. |
|  |  |
|  | We don't use the term "private" here, since no attribute is really |
|  | private in Python (without a generally unnecessary amount of work). |
|  |  |
|  | Another category of attributes are those that are part of the |
|  | "subclass API" (often called "protected" in other languages). Some |
|  | classes are designed to be inherited from, either to extend or modify |
|  | aspects of the class's behavior. When designing such a class, take |
|  | care to make explicit decisions about which attributes are public, |
|  | which are part of the subclass API, and which are truly only to be |
|  | used by your base class. |
|  |  |
|  | With this in mind, here are the Pythonic guidelines: |
|  |  |
|  | - Public attributes should have no leading underscores. |
|  |  |
|  | - If your public attribute name collides with a reserved keyword, |
|  | append a single trailing underscore to your attribute name. This is |
|  | preferable to an abbreviation or corrupted spelling. (However, |
|  | notwithstanding this rule, 'cls' is the preferred spelling for any |
|  | variable or argument which is known to be a class, especially the |
|  | first argument to a class method.) |
|  |  |
|  | Note 1: See the argument name recommendation above for class methods. |
|  |  |
|  | - For simple public data attributes, it is best to expose just the |
|  | attribute name, without complicated accessor/mutator methods. Keep |
|  | in mind that Python provides an easy path to future enhancement, |
|  | should you find that a simple data attribute needs to grow |
|  | functional behavior. In that case, use properties to hide |
|  | functional implementation behind simple data attribute access |
|  | syntax. |
|  |  |
|  | Note 1: Properties only work on new-style classes. |
|  |  |
|  | Note 2: Try to keep the functional behavior side-effect free, |
|  | although side-effects such as caching are generally fine. |
|  |  |
|  | Note 3: Avoid using properties for computationally expensive |
|  | operations; the attribute notation makes the caller believe that |
|  | access is (relatively) cheap. |
|  |  |
|  | - If your class is intended to be subclassed, and you have attributes |
|  | that you do not want subclasses to use, consider naming them with |
|  | double leading underscores and no trailing underscores. This |
|  | invokes Python's name mangling algorithm, where the name of the |
|  | class is mangled into the attribute name. This helps avoid |
|  | attribute name collisions should subclasses inadvertently contain |
|  | attributes with the same name. |
|  |  |
|  | Note 1: Note that only the simple class name is used in the mangled |
|  | name, so if a subclass chooses both the same class name and attribute |
|  | name, you can still get name collisions. |
|  |  |
|  | Note 2: Name mangling can make certain uses, such as debugging and |
|  | ``\_\_getattr\_\_()``, less convenient. However the name mangling |
|  | algorithm is well documented and easy to perform manually. |
|  |  |
|  | Note 3: Not everyone likes name mangling. Try to balance the |
|  | need to avoid accidental name clashes with potential use by |
|  | advanced callers. |
|  |  |
|  |  |
|  | Public and internal interfaces |
|  | ------------------------------ |
|  |  |
|  | Any backwards compatibility guarantees apply only to public interfaces. |
|  | Accordingly, it is important that users be able to clearly distinguish |
|  | between public and internal interfaces. |
|  |  |
|  | Documented interfaces are considered public, unless the documentation |
|  | explicitly declares them to be provisional or internal interfaces exempt |
|  | from the usual backwards compatibility guarantees. All undocumented |
|  | interfaces should be assumed to be internal. |
|  |  |
|  | To better support introspection, modules should explicitly declare the |
|  | names in their public API using the ``\_\_all\_\_`` attribute. Setting |
|  | ``\_\_all\_\_`` to an empty list indicates that the module has no public API. |
|  |  |
|  | Even with ``\_\_all\_\_`` set appropriately, internal interfaces (packages, |
|  | modules, classes, functions, attributes or other names) should still be |
|  | prefixed with a single leading underscore. |
|  |  |
|  | An interface is also considered internal if any containing namespace |
|  | (package, module or class) is considered internal. |
|  |  |
|  | Imported names should always be considered an implementation detail. |
|  | Other modules must not rely on indirect access to such imported names |
|  | unless they are an explicitly documented part of the containing module's |
|  | API, such as ``os.path`` or a package's ``\_\_init\_\_`` module that exposes |
|  | functionality from submodules. |
|  |  |
|  |  |
|  | Programming Recommendations |
|  | =========================== |
|  |  |
|  | - Code should be written in a way that does not disadvantage other |
|  | implementations of Python (PyPy, Jython, IronPython, Cython, Psyco, |
|  | and such). |
|  |  |
|  | For example, do not rely on CPython's efficient implementation of |
|  | in-place string concatenation for statements in the form ``a += b`` |
|  | or ``a = a + b``. This optimization is fragile even in CPython (it |
|  | only works for some types) and isn't present at all in implementations |
|  | that don't use refcounting. In performance sensitive parts of the |
|  | library, the ``''.join()`` form should be used instead. This will |
|  | ensure that concatenation occurs in linear time across various |
|  | implementations. |
|  |  |
|  | - Comparisons to singletons like None should always be done with |
|  | ``is`` or ``is not``, never the equality operators. |
|  |  |
|  | Also, beware of writing ``if x`` when you really mean ``if x is not |
|  | None`` -- e.g. when testing whether a variable or argument that |
|  | defaults to None was set to some other value. The other value might |
|  | have a type (such as a container) that could be false in a boolean |
|  | context! |
|  |  |
|  | - Use ``is not`` operator rather than ``not ... is``. While both |
|  | expressions are functionally identical, the former is more readable |
|  | and preferred. |
|  |  |
|  | Yes:: |
|  |  |
|  | if foo is not None: |
|  |  |
|  | No:: |
|  |  |
|  | if not foo is None: |
|  |  |
|  | - When implementing ordering operations with rich comparisons, it is |
|  | best to implement all six operations (``\_\_eq\_\_``, ``\_\_ne\_\_``, |
|  | ``\_\_lt\_\_``, ``\_\_le\_\_``, ``\_\_gt\_\_``, ``\_\_ge\_\_``) rather than relying |
|  | on other code to only exercise a particular comparison. |
|  |  |
|  | To minimize the effort involved, the ``functools.total\_ordering()`` |
|  | decorator provides a tool to generate missing comparison methods. |
|  |  |
|  | PEP 207 indicates that reflexivity rules \*are\* assumed by Python. |
|  | Thus, the interpreter may swap ``y > x`` with ``x < y``, ``y >= x`` |
|  | with ``x <= y``, and may swap the arguments of ``x == y`` and ``x != |
|  | y``. The ``sort()`` and ``min()`` operations are guaranteed to use |
|  | the ``<`` operator and the ``max()`` function uses the ``>`` |
|  | operator. However, it is best to implement all six operations so |
|  | that confusion doesn't arise in other contexts. |
|  |  |
|  | - Always use a def statement instead of an assignment statement that binds |
|  | a lambda expression directly to an identifier. |
|  |  |
|  | Yes:: |
|  |  |
|  | def f(x): return 2\*x |
|  |  |
|  | No:: |
|  |  |
|  | f = lambda x: 2\*x |
|  |  |
|  | The first form means that the name of the resulting function object is |
|  | specifically 'f' instead of the generic '<lambda>'. This is more |
|  | useful for tracebacks and string representations in general. The use |
|  | of the assignment statement eliminates the sole benefit a lambda |
|  | expression can offer over an explicit def statement (i.e. that it can |
|  | be embedded inside a larger expression) |
|  |  |
|  | - Derive exceptions from ``Exception`` rather than ``BaseException``. |
|  | Direct inheritance from ``BaseException`` is reserved for exceptions |
|  | where catching them is almost always the wrong thing to do. |
|  |  |
|  | Design exception hierarchies based on the distinctions that code |
|  | \*catching\* the exceptions is likely to need, rather than the locations |
|  | where the exceptions are raised. Aim to answer the question |
|  | "What went wrong?" programmatically, rather than only stating that |
|  | "A problem occurred" (see PEP 3151 for an example of this lesson being |
|  | learned for the builtin exception hierarchy) |
|  |  |
|  | Class naming conventions apply here, although you should add the |
|  | suffix "Error" to your exception classes if the exception is an |
|  | error. Non-error exceptions that are used for non-local flow control |
|  | or other forms of signaling need no special suffix. |
|  |  |
|  | - Use exception chaining appropriately. In Python 3, "raise X from Y" |
|  | should be used to indicate explicit replacement without losing the |
|  | original traceback. |
|  |  |
|  | When deliberately replacing an inner exception (using "raise X" in |
|  | Python 2 or "raise X from None" in Python 3.3+), ensure that relevant |
|  | details are transferred to the new exception (such as preserving the |
|  | attribute name when converting KeyError to AttributeError, or |
|  | embedding the text of the original exception in the new exception |
|  | message). |
|  |  |
|  | - When raising an exception in Python 2, use ``raise ValueError('message')`` |
|  | instead of the older form ``raise ValueError, 'message'``. |
|  |  |
|  | The latter form is not legal Python 3 syntax. |
|  |  |
|  | The paren-using form also means that when the exception arguments are |
|  | long or include string formatting, you don't need to use line |
|  | continuation characters thanks to the containing parentheses. |
|  |  |
|  | - When catching exceptions, mention specific exceptions whenever |
|  | possible instead of using a bare ``except:`` clause. |
|  |  |
|  | For example, use:: |
|  |  |
|  | try: |
|  | import platform\_specific\_module |
|  | except ImportError: |
|  | platform\_specific\_module = None |
|  |  |
|  | A bare ``except:`` clause will catch SystemExit and |
|  | KeyboardInterrupt exceptions, making it harder to interrupt a |
|  | program with Control-C, and can disguise other problems. If you |
|  | want to catch all exceptions that signal program errors, use |
|  | ``except Exception:`` (bare except is equivalent to ``except |
|  | BaseException:``). |
|  |  |
|  | A good rule of thumb is to limit use of bare 'except' clauses to two |
|  | cases: |
|  |  |
|  | 1. If the exception handler will be printing out or logging the |
|  | traceback; at least the user will be aware that an error has |
|  | occurred. |
|  |  |
|  | 2. If the code needs to do some cleanup work, but then lets the |
|  | exception propagate upwards with ``raise``. ``try...finally`` |
|  | can be a better way to handle this case. |
|  |  |
|  | - When binding caught exceptions to a name, prefer the explicit name |
|  | binding syntax added in Python 2.6:: |
|  |  |
|  | try: |
|  | process\_data() |
|  | except Exception as exc: |
|  | raise DataProcessingFailedError(str(exc)) |
|  |  |
|  | This is the only syntax supported in Python 3, and avoids the |
|  | ambiguity problems associated with the older comma-based syntax. |
|  |  |
|  | - When catching operating system errors, prefer the explicit exception |
|  | hierarchy introduced in Python 3.3 over introspection of ``errno`` |
|  | values. |
|  |  |
|  | - Additionally, for all try/except clauses, limit the ``try`` clause |
|  | to the absolute minimum amount of code necessary. Again, this |
|  | avoids masking bugs. |
|  |  |
|  | Yes:: |
|  |  |
|  | try: |
|  | value = collection[key] |
|  | except KeyError: |
|  | return key\_not\_found(key) |
|  | else: |
|  | return handle\_value(value) |
|  |  |
|  | No:: |
|  |  |
|  | try: |
|  | # Too broad! |
|  | return handle\_value(collection[key]) |
|  | except KeyError: |
|  | # Will also catch KeyError raised by handle\_value() |
|  | return key\_not\_found(key) |
|  |  |
|  | - When a resource is local to a particular section of code, use a |
|  | ``with`` statement to ensure it is cleaned up promptly and reliably |
|  | after use. A try/finally statement is also acceptable. |
|  |  |
|  | - Context managers should be invoked through separate functions or methods |
|  | whenever they do something other than acquire and release resources. |
|  | For example: |
|  |  |
|  | Yes:: |
|  |  |
|  | with conn.begin\_transaction(): |
|  | do\_stuff\_in\_transaction(conn) |
|  |  |
|  | No:: |
|  |  |
|  | with conn: |
|  | do\_stuff\_in\_transaction(conn) |
|  |  |
|  | The latter example doesn't provide any information to indicate that |
|  | the ``\_\_enter\_\_`` and ``\_\_exit\_\_`` methods are doing something other |
|  | than closing the connection after a transaction. Being explicit is |
|  | important in this case. |
|  |  |
|  | - Be consistent in return statements. Either all return statements in |
|  | a function should return an expression, or none of them should. If |
|  | any return statement returns an expression, any return statements |
|  | where no value is returned should explicitly state this as ``return |
|  | None``, and an explicit return statement should be present at the |
|  | end of the function (if reachable). |
|  |  |
|  | Yes:: |
|  |  |
|  | def foo(x): |
|  | if x >= 0: |
|  | return math.sqrt(x) |
|  | else: |
|  | return None |
|  |  |
|  | def bar(x): |
|  | if x < 0: |
|  | return None |
|  | return math.sqrt(x) |
|  |  |
|  | No:: |
|  |  |
|  | def foo(x): |
|  | if x >= 0: |
|  | return math.sqrt(x) |
|  |  |
|  | def bar(x): |
|  | if x < 0: |
|  | return |
|  | return math.sqrt(x) |
|  |  |
|  | - Use string methods instead of the string module. |
|  |  |
|  | String methods are always much faster and share the same API with |
|  | unicode strings. Override this rule if backward compatibility with |
|  | Pythons older than 2.0 is required. |
|  |  |
|  | - Use ``''.startswith()`` and ``''.endswith()`` instead of string |
|  | slicing to check for prefixes or suffixes. |
|  |  |
|  | startswith() and endswith() are cleaner and less error prone. For |
|  | example:: |
|  |  |
|  | Yes: if foo.startswith('bar'): |
|  | No: if foo[:3] == 'bar': |
|  |  |
|  | - Object type comparisons should always use isinstance() instead of |
|  | comparing types directly. :: |
|  |  |
|  | Yes: if isinstance(obj, int): |
|  |  |
|  | No: if type(obj) is type(1): |
|  |  |
|  | When checking if an object is a string, keep in mind that it might |
|  | be a unicode string too! In Python 2, str and unicode have a |
|  | common base class, basestring, so you can do:: |
|  |  |
|  | if isinstance(obj, basestring): |
|  |  |
|  | Note that in Python 3, ``unicode`` and ``basestring`` no longer exist |
|  | (there is only ``str``) and a bytes object is no longer a kind of |
|  | string (it is a sequence of integers instead) |
|  |  |
|  | - For sequences, (strings, lists, tuples), use the fact that empty |
|  | sequences are false. :: |
|  |  |
|  | Yes: if not seq: |
|  | if seq: |
|  |  |
|  | No: if len(seq): |
|  | if not len(seq): |
|  |  |
|  | - Don't write string literals that rely on significant trailing |
|  | whitespace. Such trailing whitespace is visually indistinguishable |
|  | and some editors (or more recently, reindent.py) will trim them. |
|  |  |
|  | - Don't compare boolean values to True or False using ``==``. :: |
|  |  |
|  | Yes: if greeting: |
|  | No: if greeting == True: |
|  | Worse: if greeting is True: |
|  |  |
|  | Function Annotations |
|  | -------------------- |
|  |  |
|  | With the acceptance of PEP 484, the style rules for function |
|  | annotations are changing. |
|  |  |
|  | - In order to be forward compatible, function annotations in Python 3 |
|  | code should preferably use PEP 484 syntax. (There are some |
|  | formatting recommendations for annotations in the previous section.) |
|  |  |
|  | - The experimentation with annotation styles that was recommended |
|  | previously in this PEP is no longer encouraged. |
|  |  |
|  | - However, outside the stdlib, experiments within the rules of PEP 484 |
|  | are now encouraged. For example, marking up a large third party |
|  | library or application with PEP 484 style type annotations, |
|  | reviewing how easy it was to add those annotations, and observing |
|  | whether their presence increases code understandability. |
|  |  |
|  | - The Python standard library should be conservative in adopting such |
|  | annotations, but their use is allowed for new code and for big |
|  | refactorings. |
|  |  |
|  | - For code that wants to make a different use of function annotations |
|  | it is recommended to put a comment of the form:: |
|  |  |
|  | # type: ignore |
|  |  |
|  | near the top of the file; this tells type checker to ignore all |
|  | annotations. (More fine-grained ways of disabling complaints from |
|  | type checkers can be found in PEP 484.) |
|  |  |
|  | - Like linters, type checkers are optional, separate tools. Python |
|  | interpreters by default should not issue any messages due to type |
|  | checking and should not alter their behavior based on annotations. |
|  |  |
|  | - Users who don't want to use type checkers are free to ignore them. |
|  | However, it is expected that users of third party library packages |
|  | may want to run type checkers over those packages. For this purpose |
|  | PEP 484 recommends the use of stub files: .pyi files that are read |
|  | by the type checker in preference of the corresponding .py files. |
|  | Stub files can be distributed with a library, or separately (with |
|  | the library author's permission) through the typeshed repo [5]\_. |
|  |  |
|  | - For code that needs to be backwards compatible, type annotations |
|  | can be added in the form of comments. See the relevant section of |
|  | PEP 484 [6]\_. |
|  |  |
|  |  |
|  | .. rubric:: Footnotes |
|  |  |
|  | .. [#fn-hi] \*Hanging indentation\* is a type-setting style where all |
|  | the lines in a paragraph are indented except the first line. In |
|  | the context of Python, the term is used to describe a style where |
|  | the opening parenthesis of a parenthesized statement is the last |
|  | non-whitespace character of the line, with subsequent lines being |
|  | indented until the closing parenthesis. |
|  |  |
|  |  |
|  | References |
|  | ========== |
|  |  |
|  | .. [1] PEP 7, Style Guide for C Code, van Rossum |
|  |  |
|  | .. [2] Barry's GNU Mailman style guide |
|  | http://barry.warsaw.us/software/STYLEGUIDE.txt |
|  |  |
|  | .. [3] Donald Knuth's \*The TeXBook\*, pages 195 and 196. |
|  |  |
|  | .. [4] http://www.wikipedia.com/wiki/CamelCase |
|  |  |
|  | .. [5] Typeshed repo |
|  | https://github.com/python/typeshed |
|  |  |
|  | .. [6] Suggested syntax for Python 2.7 and straddling code |
|  | https://www.python.org/dev/peps/pep-0484/#suggested-syntax-for-python-2-7-and-straddling-code |
|  |  |
|  |  |
|  |  |
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|  |  |
|  |  |
|  | .. |
|  | Local Variables: |
|  | mode: indented-text |
|  | indent-tabs-mode: nil |
|  | sentence-end-double-space: t |
|  | fill-column: 70 |
|  | coding: utf-8 |
|  | End: |