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Differences between Python2 and Python3

Python 3 introduced significant changes from Python 2, aiming to address inconsistencies and improve the language's overall design and usability. Here's a summary of the key changes:

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Print( ) Function

Python 2

“***print***” was a statement, so it didn’t require parentheses.
Example: `print "Hello, World!"

Python 3

“***print***” became a function, requiring parentheses.
Example: print("Hello, World!")


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Unicode by Default

Python 2

Strings were by default ASCII-encoded. Unicode strings needed to be explicitly defined with a `u` prefix, like `u"hello"`

Python 3

All strings are Unicode by default, which simplifies working with text in different languages. Byte strings are defined with a `b` prefix, like `b"hello"`

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Division Operator

Python 2

The division operator `/` performed integer division if both operands were integers, truncating the result. For floating-point division, one of the operands needed to be a float. Example: `5 / 2` results in `2`

Python 3

The `/` operator always performs true division, returning a float. Integer division is done using `//`. Example: `5 / 2` results in `2.5`, while `5 // 2` results in `2`

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Iterators and Ranges

Python 2

Functions like `range()`, `zip()`, and `map()` returned lists.

Python 3

These functions return iterators instead of lists, which are more memory-efficient. If a list is needed, you can explicitly convert the iterator using `list()`. For example, `range(5)` in Python 3 behaves like `xrange()` in Python 2

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Error Handling

Python 2

Exceptions were caught using the `except` keyword followed by the exception. Example: `except IOError, e:`

Python 3

The syntax was changed to `except IOError as e:` to improve clarity and consistency


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input( ) Function

Python 2

input( )` evaluated the input as Python code, which could be a security risk. `raw_input( )` was used to get a string.

Python 3

input( )` always returns a string, eliminating `raw_input( )`. Example: `input("Enter your name: ")` will always return a string

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Standard Library Changes

Several modules were renamed or reorganized. For example, `ConfigParser` in Python 2 became `configparser` in Python 3 (consistent lowercase naming). Also, many libraries were updated to support new Python 3 features


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Dictionary Methods

Python 2

Methods like `dict.keys()`, `dict.items()`, and `dict.values()` returned lists

Python 3

These methods return view objects instead of lists, which are more memory-efficient. If a list is needed, you can convert the view using `list(dict.keys())`

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Integer Division

Python 2

Dividing two integers would result in an integer, truncating the result

Python 3

Dividing two integers using `/` produces a float, while `//` gives an integer result


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Metaclass Syntax

Python 2

The `__metaclass__` attribute was used for defining metaclasses

Python 3

Metaclass syntax is more explicit with `class MyClass(BaseClass, metaclass=MetaClass)`

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Removal of Deprecated Features

Python 3 removed many old and deprecated features from Python 2, such as the `<>` operator for inequality (replaced by `!=`), and old-style classes

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Improved Integer Handling

Python 2

Had distinct `int` and `long` types, with the latter used for larger integers

Python 3

There is only one integer type (`int`), which automatically supports large values

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Standard Library Reorganization

The standard library was reorganized, with some modules renamed, merged, or removed. The focus was on consistency and removing redundancy

Conclusion

The transition from Python 2 to Python 3 introduced breaking changes that aimed to streamline the language, making it more consistent and efficient. While the changes required developers to update their codebases, Python 3's improvements have been widely adopted and have set the stage for the language's continued growth and evolution

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