12.5. `marshal` — Internal Python object serialization¶

This module contains functions that can read and write Python values in a binary format. The format is specific to Python, but independent of machine architecture issues (e.g., you can write a Python value to a file on a PC, transport the file to a Sun, and read it back there). Details of the format are undocumented on purpose; it may change between Python versions (although it rarely does). [1]

This is not a general "persistence" module. For general persistence and transfer of Python objects through RPC calls, see the modules `pickle` and `shelve`. The `marshal` module exists mainly to support reading and writing the "pseudo-compiled" code for Python modules of `.pyc` files. Therefore, the Python maintainers reserve the right to modify the marshal format in backward incompatible ways should the need arise. If you're serializing and de-serializing Python objects, use the `pickle` module instead – the performance is comparable, version independence is guaranteed, and pickle supports a substantially wider range of objects than marshal.

Warning

The `marshal` module is not intended to be secure against erroneous or maliciously constructed data. Never unmarshal data received from an untrusted or unauthenticated source.

Not all Python object types are supported; in general, only objects whose value is independent from a particular invocation of Python can be written and read by this module. The following types are supported: booleans, integers, long integers, floating point numbers, complex numbers, strings, Unicode objects, tuples, lists, sets, frozensets, dictionaries, and code objects, where it should be understood that tuples, lists, sets, frozensets and dictionaries are only supported as long as the values contained therein are themselves supported; and recursive lists, sets and dictionaries should not be written (they will cause infinite loops). The singletons `None`, `Ellipsis` and `StopIteration` can also be marshalled and unmarshalled.

Warning

On machines where C's `long int` type has more than 32 bits (such as the DEC Alpha), it is possible to create plain Python integers that are longer than 32 bits. If such an integer is marshaled and read back in on a machine where C's `long int` type has only 32 bits, a Python long integer object is returned instead. While of a different type, the numeric value is the same. (This behavior is new in Python 2.2. In earlier versions, all but the least-significant 32 bits of the value were lost, and a warning message was printed.)

There are functions that read/write files as well as functions operating on strings.

The module defines these functions:

`marshal.dump`(*value*, *file*[, *version*])¶

Write the value on the open file. The value must be a supported type. The file must be an open file object such as `sys.stdout` or returned by `open()` or `os.popen()`. It must be opened in binary mode (`'wb'` or `'w+b'`).

If the value has (or contains an object that has) an unsupported type, a `ValueError` exception is raised — but garbage data will also be written to the file. The object will not be properly read back by `load()`.

New in version 2.4: The *version* argument indicates the data format that `dump` should use (see below).

`marshal.load`(*file*)¶

Read one value from the open file and return it. If no valid value is read (e.g. because the data has a different Python version's incompatible marshal format), raise `EOFError`, `ValueError` or `TypeError`. The file must be an open file object opened in binary mode (`'rb'` or `'r+b'`).

Note

If an object containing an unsupported type was marshalled with `dump()`, `load()` will substitute `None` for the unmarshallable type.

`marshal.dumps`(*value*[, *version*])¶

Return the string that would be written to a file by `dump(value, file)`. The value must be a supported type. Raise a `ValueError` exception if value has (or contains an object that has) an unsupported type.

New in version 2.4: The *version* argument indicates the data format that `dumps` should use (see below).

`marshal.loads`(*string*)¶

Convert the string to a value. If no valid value is found, raise `EOFError`, `ValueError` or `TypeError`. Extra characters in the string are ignored.

In addition, the following constants are defined:

`marshal.version`¶

Indicates the format that the module uses. Version 0 is the historical format, version 1 (added in Python 2.4) shares interned strings and version 2 (added in Python 2.5) uses a binary format for floating point numbers. The current version is 2.

New in version 2.4.

Footnotes

[1]	The name of this module stems from a bit of terminology used by the designers of Modula-3 (amongst others), who use the term “marshalling” for shipping of data around in a self-contained form. Strictly speaking, “to marshal” means to convert some data from internal to external form (in an RPC buffer for instance) and “unmarshalling” for the reverse process.