## 1.1 Python 3.x Magic Methods

c__ini__() Initialize the object

## 1.2 Conversion

| | |
|---|---|
| c__str__() | str(c) |
| c__rep__() | repr(c) |
| c__forma__(spec) | "{0:spec}".format(c) |
| c__complex__() | complex(c) |
| c__int__() | to int |
| c.__float__() | to float |
| c.__bool__() | to bool |
| c.__bytes__() | like __str__ but for byte arrays |

## 1.3 Iteration

| | |
|---|---|
| c.__iter__() | iter(c) |
| c.__next__() | next(c) |
| c.__reversed__() | reverse iterator |

## 1.4 Attribute access

| | |
|---|---|
| c.__getattr__(a) | c.a, fallback |
| c.__getattribute__(a) | c.a, unconditional |
| c.__setattr__(a, v) | c.a = v |
| c.__delattr__(a) | del c.a |
| c.__dir__() | list attributes (for dir()) |
| c.__dict__[] | access class dict directly |

## 1.5 Calling

| | |
|---|---|
| c.__call__(...) | c(...) |

## 1.6 Immutable container

| | |
|---|---|
| c.__contains__(e) | e in c |
| c.__len__() | Length (for len()) |
| c.__getitem__(x) | c[x] |

## 1.7 Mutable container

| | |
|---|---|
| c.__setitem__(x, v) | c[x] = v |
| c.__delitem__(x) | del c[x] |
| c.__missing__(x) | c[x] if c not in x |

## 1.8 Emulating numbers

| | |
|---|---|
| c.__add__(x) | c + x |
| c.__sub__(x) | c - x |
| c.__mul__(x) | c * x |
| c.__mod__(x) | c % x |
| c.__floordiv__(x) | c // x |
| c.__divmod__(x) | divmod(c, x) |
| c.__pow__(x) | c ** x |
| c.__rshift__(x) | c >> x |
| c.__lshift__(x) | c << x |
| c.__and__(x) | c & x |
| c.__xor__(x) | c ^ x |
| c.__or__(x) | c \| x |
| c.__radd__(x) | x + c |
| etc. | |
| c.__iadd__(x) | c += x |
| etc. | |
| c.__neg__(x) | -c |
| c.__pos__() | +c |
| c.__abs__() | abs(c) |
| c.__invert__() | ~c |
| c.__round__(n) | round(c, n) |
| c.__floor__() | used by math.floor() |
| c.__ceil__() | used by math.ceil() |
| c.__trunc__() | used by math.trunc() |
| c.__index__() | lst[c] |
| c.__oct__() | oct(c) |
| c.__hex__() | hex(c) |
| c.__matmul__() | matrix multiplication with @ |

## 1.9 Comparisons

| | |
|---|---|
| c._lt_(o) | c < o |
| c.__gt__(o) | c > o |
| c.__le__(o) | c <= o |
| c.__ge__(o) | c >= o |
| c.__eq__(o) | c == o |
| c.__ne__(o) | c != o |

## 1.10 Context handlers

| | |
|---|---|
| c.__enter__(o) | with c: (entry) |
| c.__exit__(o, exp_type, exp_val, trace) | with c: (exit) |

## 1.11 Low-level stuff

Read the documentation!

| | |
|---|---|
| c.__new__(cls, …) | object construction |
| c.__del__() | clean up object |
| c.__slots__() | limit attributes |
| c.__hash__() | compute hash value |
| c.__sizeof__() | sys.getsizeof(c) |
| c.__metaclass__() | the class of the class |
| c__prepare__() | used for metaclasses |
| c.__instancecheck__(x) | isinstance(x, c) |
| c.__subclasscheck__(x) | issubclass(x, c) |

## 1.12 Pickling

| | |
|---|---|
| c.__getstate__() | pickle.dump(pkl_file, self) |
| c.__setstate__() | data = pickle.load(pkl_file) |

There few more magic methods for advanced pickling

## 1.13 Copying

| | |
|---|---|
| c.__copy__() | copy.copy() for c |
| c.__deepcopy__(memodict={}) | copy.deepcopy() for c |

## 1.14 Descriptor Objects

Class with one or more methods like this:

| | |
|---|---|
| c.__get__(instance, owner) | when value is retrieved |
| c.__set__(instance, value) | when value is changed |
| c.__delete__(self, instance) | when value is deleted |

owner is the owner class itself

## 1.15 Built-ins

| | |
|---|---|
| __all__[] | list of default module exports |
| __doc__ | doc strings |
| __name__ | module name or “__main__” |
| __qualname__ | full name of the class |
| __module__ | module name |
| __defaults__{} | default argument values |
| __kwdefaults__{} | defaults for keyword-only parameters |
| __code__ | code object of compiled function body |
| __globals__{} | function’s global variables |
| __version__ | module version in string format |