Glossary

Abstraction

The processing of separating the external behavior of objects from the details of their internal implementation and constructing relationships among diff erent types of objects by recognizing their shared or divergent behaviors.

Boolean Condition

An expression that evaluates to either True or False (i.e., a Boolean), for use with if statements and while loops.

Boolean

A value that is either true or false. In Python, booleans are represented by the type bool.

Class

A template for creating user-defined objects.

Container

A data object that can hold other data objects. Also sometimes referred to as a “collection”.

Data type

A particular kind of data item, as defined by the values it can take and the operations that can be performed on it.

Default arguments

Function arguments that can be assigned default values, which those arguments adopt in execution of the function if they are not explicitly passed values in a function call.

Dictionary

A container type that groups Python objects by mapping keys to values. Key-value pairs appear in no guaranteed order.

Divide and conquer

A strategy to solve complex problems by dividing them into a set of simpler problems and then solving (or “conquering”) those simpler problems.

Docstrings

Short for "documentation strings," docstrings are strings that document what a function, method, module, or other object does, such that the documentation can be queried with the built-in help system. Docstrings are stored in the __doc__ attribute of whatever object they are describing.

Exception

An error detected at runtime based upon an expression that cannot be evaluated with the data provided. In Python, there are many diff erent exceptions based upon the nature of the detected error, but Python provides try-except blocks that programmers can use to enable their code to recover from these errors.

Expression

A combination of one or more constants, variables, operators, and functions that the programming language interprets and computes to produce another value.

Floating point

A computer representation of a real number, specified to some prescribed number of decimal places. In Python, floating point numbers are represented by the type float.

For loop

A programming construct to iterate through a body of code, consisting of a header statement that specifies the iteration and a code body which is executed once per iteration. In Python, this is typically used to access each element of an iterable container (for element in iterable) or to execute the code body a specified number of times (for i in range(N)).

Function

An object that takes inputs and produces outputs. A function might also change inputs as a side effect.

Function body

The inner part of a function definition that carries out the computations to implement whatever it is that the function does.

Function prototype or header

The beginning of a function definition that identifies the name of the function and the set of input arguments that it takes. In statically typed programming languages, the types of the inputs are usually specified in the function header, as is the type of the function output. In Python (which is dynamically typed), this type information is not provided.

If statement

A programming construct to branch the control flow of code based on some Boolean condition. In Python, if statements can be accompanied by elif and else statements to specify multiple code branches based upon the state of the data.

In-place modification

Also known as “side effect” ; the process by which a function (when it is called) modifies an object that exists outside of the function, as opposed to creating and returning a new object as part of the function operation.

Instance

Individual objects produced from a class template.

Integer

A whole number: a number that is not a fraction or with digits following a decimal point. In Python, integers are represented by the type int.

Interpreter

A computer program that reads and evaluates expressions in a programming language such as Python.

.ipynb

The file format used by Jupyter Notebooks (formerly known as “IPython notebooks”), which uses the JSON plain-text format to store all the information contained in a notebook.

IPython

An enhanced interpreter providing additional functionality beyond the default Python interpreter, often useful during interactive use.

Iterable

Anything that can be iterated over; e.g., in a for loop with a statement such as “for element in iterable”, such that the element assumes the value of each item in the iterable as the iteration proceeds.

Jupyter Notebook

A web-based interpreter that ties together code, analyses, documentation, and graphics

Keyword arguments

Function arguments that can be assigned values by passing in both the name and value of the argument, separated by an equal sign; e.g., f(arg=value), which assigns value to the function argument named arg.

List

A container type that groups objects in a specific order. List items are ordered sequentially and can be accessed and reassigned by their position.

Magic function

A function or utility provided by the IPython interpreter that provides additional functionality beyond that contained in the core Python language or its libraries.

Method

A function that is attached to an object. Some methods alter the object they are attached to and some methods return a different object.

Namespace

A set of object names associated with some other object, such as the names of methods associated with a particular data type, or the names of variables associated with a module.

Object-oriented

A feature of some programming languages that enables a system to be modeled as a set of objects and their associated behaviors, and typically providing a capability for the definition of new custom data types.

Positional Arguments

Function arguments that are assigned based upon their position in the ordered sequence of inputs.

Return statement

A specific statement in a function definition that indicates what values are returned from the function, at which point control flow exits the function. A function can contain multiple return statements, if there are multiple exit points.

Self

A conventional name used to indicate the first argument of a method in a class definition, corresponding to the instance on which that method was called. “Self” is not a keyword in the Python language but a generally used name (i.e., a convention) for naming the first argument in method definitions.

Set

A container type that groups unique Python objects with no intrinsic order, intended to reflect the behavior of mathematical sets.

String

A container type that is an ordered sequence of textual “characters”, which can consist of letters, numbers, whitespace, unicode characters, etc.

Tuple

A container type that groups objects together in a specific order, typically to bundle those objects together. In Python, tuples cannot be changed once created.

Variable

A name that is attached to an object, allowing for access to that object by the name.

While loop

A programming construct to iterate through a body of code, continuing as long as some Boolean condition is met, consisting of a header statement that specifies the iteration condition (while condition) and a code body which is executed once per iteration until the loop is exited (at the first time the condition is not met).