B

Python Standard Modules

The Python standard library contains well over 200 modules, although the exact number varies between distributions. Not all of these modules are recommended for use by the typical Python programmer; many have specialized uses associated with the Python internal modules and are intended mainly for use by developers working on Python itself. And certain other modules, remnants of older Python versions now superseded by more modern alternatives, are retained mainly for compatibility with old code.

This appendix lists all of the standard packages and modules that are recommended for "normal use" and highlights, in bold, those used or discussed in this book. Modules marked in the official documentation as deprecated, or intended for use by core developers, as well as some designed to be development tools, have been omitted from the list. A few minor clarifications to the descriptions have been added. Not all packages have been expanded to show the individual modules, and in these cases a package-level description is provided.

a

aifc	Read and write audio files in AIFF or AIFC format.
argparse	**Command-line option and argument-parsing library.**
array	Space-efficient arrays of uniformly typed numeric values.
asynchat	Support for asynchronous command/response protocols.
asyncio	Asynchronous I/O, event loop, coroutines, and tasks.
asyncore	A base class for developing asynchronous socket-handling services.
atexit	Register and execute cleanup functions.
audioop	Manipulate raw audio data.

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b

base64	RFC 3548: Base16, Base32, Base64 Data Encodings; Base85, and ASCII85.
binascii	Tools for converting data to and from various ASCII-encoded binary representations.
binhex	Encode and decode files in binhex4 format.
bisect	Array bisection algorithms for binary searching.
bz2	Interfaces for bzip2 compression and decompression.

c

calendar	**Functions for working with calendars, including some emulation of the UNIX cal(1) program.**
cgi	Helpers for running Python scripts via the common gateway interface (CGI).
cgitb	Configurable traceback handler for CGI scripts.
chunk	Module to read Interchange File Format (IFF) chunks.
cmath	**Mathematical functions for complex numbers.**
cmd	**Build line-oriented command interpreters.**
code	Facilities to implement read-eval-print loops.
codecs	Encode and decode data and streams.
collections	**Container data types.**
collections.abc	Abstract base classes for containers.
colorsys	Conversion functions between RGB and other color systems.
compileall	Tools for byte-compiling all Python source files in a directory tree or some subset thereof.
concurrent	Execute computations concurrently using threads or processes.
configparser	**Configuration file parser.**
contextlib	**Utilities for with-statement contexts.**
copy	Shallow and deep copy operations.
copyreg	Register pickle support functions.
crypt (UNIX)	The `crypt()` function used to check UNIX passwords.
csv	**Write and read tabular data to and from comma-delimited data files. (Other delimiters can also be used.)**
ctypes	**A foreign function library for Python.**
curses (UNIX)	An interface to the curses library, providing portable terminal handling.

d

datetime	**Basic date and time types.**
dbm	**Interfaces to various key-value database formats.**
decimal	**Implementation of the General Decimal Arithmetic Specification.**
difflib	Helper classes and functions for computing differences between objects.
distutils	Support for building and installing Python modules into an existing Python installation.
doctest	**Test snippets of code appearing within docstrings.**

e

e-mail	Package supporting the parsing, manipulating, and generating of e-mail messages, including MIME documents.
encodings	Package supporting various character encodings.
enum	Implementation of an enumeration class.
errno	Standard errno system symbols.

f

fcntl (UNIX)	The `fcntl()` and `ioctl()` system calls.
filecmp	Compare files efficiently.
fileinput	Loop over standard input or a list of files.
fnmatch	UNIX shell–style filename pattern matching.
fractions	**Rational numbers.**
ftplib	FTP protocol client (requires sockets).
functools	**Higher-order functions and operations on callable objects.**

g

getpass	Portable reading of passwords and retrieval of the user ID.
gettext	**Multilingual internationalization services.**
glob	**UNIX shell–style pathname pattern expansion.**
grp (UNIX)	The group database (`getgrnam()` and friends).
gzip	Interfaces for gzip compression and decompression using file objects.

h

hashlib	Secure hash and message digest algorithms.
heapq	Heap queue algorithm (aka, priority queue).
hmac	Keyed-Hashing for Message Authentication (HMAC) implementation for Python.
html.entities	**Data structures useful for processing HTML.**
html.parser	**A simple parser that can handle HTML and XHTML.**
http	Package supporting use of HTTP including client, server, and cookie management.
http.server	HTTP server and request handlers.

i

imaplib	IMAP4 protocol client (requires sockets).
imghdr	Determine the type of image contained in a file or byte stream.
io	Core tools for working with streams.
ipaddress	IPv4/IPv6 manipulation library.
itertools	**Functions creating iterators for efficient looping.**

j

json	Encode and decode the JSON data format.

k

keyword	Test whether a given string is a Python keyword.

l

linecache	Provides random access to individual lines from text files using a cache.
locale	**Internationalization services.**
logging	**Flexible event logging for applications.**
lzma	A Python wrapper for the liblzma compression library.

m

macpath	Mac OS 9 path manipulation functions.
mailbox	Manipulate mailboxes in various formats.
mailcap	Mailcap file handling.
math	**Mathematical functions [`sin()`, and so on].**
mimetypes	Mapping of filename extensions to MIME types.
mmap	Interface to memory-mapped files for UNIX and Windows.
msvcrt (Windows)	**Miscellaneous useful routines from the MS VC++ run time.**
multiprocessing	Package for process-based parallelism.

n

netrc	Loading of `.netrc` files.
nis (UNIX)	Interface to Sun's NIS (Yellow Pages) library.
nntplib	NNTP protocol client (requires sockets).
numbers	Abstract base classes for numeric types (Complex, Real, Integral, and so on).

o

operator	Functions corresponding to the standard operators (add, subtract, and so on).
os	**Miscellaneous operating system interfaces.** As Chapter 2 makes clear, the `os` module is one of several modules used to interact with the OS on Python, and the selection of functions provided is somewhat arbitrary and inconsistent.
os.path	Provides helper functions for manipulating and testing file paths.
ossaudiodev (Linux, FreeBSD)	Access to OSS-compatible audio devices.

p

pathlib	Provides an object-oriented model of file system paths.
pdb	**A debugger for interactive Python interpreters.**
pickle	**Convert Python objects to streams of bytes and back.**
pipes (UNIX)	A Python interface to UNIX shell pipelines.
platform	Retrieves as much platform identifying data as possible.
plistlib	Generate and parse Mac OS X plist files.

poplib	POP3 protocol client (requires sockets).
pprint	Pretty prints Python data structures.
profile	Python source code profiler.
pstats	Statistics object for use with the profiler.
pty (Linux)	Handling of pseudo-terminals for Linux.
pwd (UNIX)	**The password database [`getpwnam()` and friends].**

q

queue	A queue class suitable for communicating between threads.
quopri	Encode and decode files using the MIME quoted-printable encoding.

r

random	Generate pseudorandom numbers with various common distributions.
re	**Regular-expression operations.**
readline (UNIX)	GNU readline support for Python.
reprlib	An alternate `repr()` implementation with size limits.
resource (UNIX)	An interface to provide resource usage information about the current process.

s

sched	General-purpose event scheduler.
select	Wait for I/O completion on multiple streams.
selectors	High-level I/O multiplexing.
shelve	**Python object persistence.**
shlex	**Simple lexical analysis for UNIX shell–like languages.**
shutil	**High-level file operations, including copying.**
signal	Set handlers for asynchronous events.
smtpd	An SMTP server implementation in Python.
smtplib	SMTP protocol client (requires sockets).
sndhdr	Determine the type of sound file.
socket	**Low-level networking interface.**
socketserver	**A framework for network servers.**
spwd (UNIX)	The shadow password database [`getspnam()` and friends].
sqlite3	**A DB-API 2.0 implementation using SQLite 3.x.**
ssl	TLS/SSL wrapper for socket objects.

stat	**Utilities for interpreting the results of `os.stat()`, `os.lstat()`, and `os.fstat()`.**
statistics	**Mathematical statistics functions.**
string	Common string operations.
stringprep	String preparation, as per RFC 3453.
struct	**Read and write binary data in a byte array.**
subprocess	**Subprocess management.**
sunau	Provide an interface to the Sun AU sound format.
sys	**Access system-specific parameters and functions.**
sysconfig	Python's configuration information.
syslog (UNIX)	An interface to the UNIX syslog library routines.

t

tarfile	Read and write tar-format archive files.
telnetlib	Telnet client class.
tempfile	Generate temporary files and directories.
termios (UNIX)	POSIX style TTY control.
textwrap	Text wrapping and filling.
threading	Parallel processing based on threads.
time	**Time access and conversions.**
timeit	Measure the execution time of code snippets.
tkinter	**Interface to Tcl/Tk for graphical user interfaces.**
tkinter.messagebox	**Standard message dialogs.**
tkinter.tix	**Tk Extension Widgets for Tkinter.**
tkinter.ttk	**Tk themed widget set.**
tkinter.filedialog	**Variations on standard File dialogs.**
tkinter.simpledialog	**A base class for building custom dialogs.**
tty (UNIX)	Utility functions that perform common terminal control operations.
turtle	**An educational framework for developing simple graphics applications.**
types	Names for Python's built-in types.

u

unicodedata	**Access the Unicode database.**
unittest	**Unit testing framework for Python.**
urllib	Package for processing URLs including requests, responses, errors, and so on.
uu	Encode and decode file-like objects to and from uuencode format.
uuid	UUID objects (universally unique identifiers) according to RFC 4122.

W

warnings	Issue warning messages and control their disposition.
wave	Provide an interface to the WAV sound format.
weakref	Support for weak references and weak dictionaries.
webbrowser	Easy-to-use controller for web browsers.
win32com.client	**Third-party module providing access to the native Win32 API.**
winreg (Windows)	**Provides helper functions and a Key class for manipulating the Windows registry.**
winsound (Windows)	Access to the sound-playing machinery for Windows.
wsgiref	Package providing a reference implementation of WSGI along with various WSGI utility functions and classes.

X

xdrlib	Encoders and decoders for the External Data Representation (XDR).
xml	**Package containing XML processing modules.**
xml.dom	Document object model (DOM) API for Python.
xml.minidom	Minimal document object model (DOM) implementation.
xml.etree	Implementation of the ElementTree API.
Xml.parsers.expat	An interface to the Expat non-validating XML parser.
xml.sax	Package containing SAX2 base classes and convenience functions.
xml.sax.handler	Base classes for SAX event handlers.
xmlrpc	Package providing support for XMLRPC.
Xmlrpc.client	Provides helper functions and classes for XML-RPC client access.
Xmlrpc.server	Basic XML-RPC server implementations.

Z

zipfile	Read and write zip-format archive files.
zlib	Low-level interface to compression and decompression routines compatible with gzip.